

## LEED Narrative

This proposed project had the goal to become LEED certified. After completing a LEED checklist, it was determined that this project will earn a total of 40 LEED points, securing LEED certification for the proposed project.

### INTEGRATIVE PROCESS

The intent of the Integrative Process point when it comes to the implementation of LEED certification is to facilitate a high-performance and cost-effective project by analyzing the connections between the varying systems in the construction process. In order to achieve this point toward the lead certification for the proposed project, we will identify opportunities before and during the design phase to achieve synergies across building systems. In order to analyze the energy related systems in this project, we will perform a “simple-box” energy modeling analysis and assess at least two of the following:

- *Site conditions.* Assess shading, exterior lighting, hardscape, landscaping, and adjacent site conditions.
- *Massing and orientation.* Assess massing and orientation affect HVAC sizing, energy consumption, lighting, and renewable energy opportunities.
- *Basic envelope attributes.* Assess insulation values, window-to-wall ratios, glazing characteristics, shading, and window operability.
- *Lighting levels.* Assess interior surface reflectance values and lighting levels in occupied spaces.
- *Thermal comfort ranges.* Assess thermal comfort range options.
- *Plug and process load needs.* Assess reducing plug and process loads through programmatic solutions (e.g., equipment and purchasing policies, layout options).
- *Programmatic and operational parameters.* Assess multifunctioning spaces, operating schedules, space allotment per person, teleworking, reduction of building area, and anticipated operations and maintenance.

We will then document how our analysis informed design of the project, including:

- Building and site program;
- Building form and geometry;
- Building envelope and façade treatments on different orientations;
- Elimination and/or significant downsizing of building systems (e.g., HVAC, lighting, controls, Exterior materials, interior finishes, and functional program elements); and
- Other systems.

To achieve the point toward our LEED certification, we must also analyze the water related systems. We will perform a water budget analysis before completion of the schematic design phase and assess the following:

- *Indoor water demand.* Assess flow and flush fixture design case demand volumes, calculated in accordance with WE Prerequisite Indoor Water Use Reduction.
- *Outdoor water demand.* Assess landscape irrigation design case demand volume calculated in accordance with WE Credit Outdoor Water-Use Reduction.
- *Process water demand.* Assess kitchen, laundry, cooling tower, and other equipment demand volumes, as applicable.
- *Supply sources.* Assess all potential nonpotable water supply source volumes, such as on-site rainwater and graywater, municipally supplied nonpotable water, and HVAC equipment condensate.

The documentation of this analysis will include how our building designs were informed, including the following:

- plumbing systems;
- sewage conveyance and/or on-site treatment systems;
- rainwater quantity and quality management systems;
- landscaping, irrigation, and site elements;
- roofing systems and/or building form and geometry; and
- other systems.

These analyses will help us to better integrate our project's systems and will influence the overall sustainability of the project.

## LOCATION AND TRANSPORTATION

### *Sensitive Land Protection*

In order to avoid the development of environmentally sensitive lands and reduce the environmental impact from the location of a building on a site, our proposed project will be built on a site that has previously existing developments. Satisfying this credit earns 1 LEED point.

## SUSTAINABLE SITES

### *Construction Activity Pollution Prevention (Required)*

The intent of this LEED requirement is to reduce pollution from construction activities by controlling soil erosion, waterway sedimentation, and airborne dust. In order to satisfy this requirement, we have to create and implement an erosion and sedimentation control plan for any and all construction related activities for the proposed project.

### *Site Assessment*

In order to assess site conditions before design to evaluate sustainable options and inform related decisions about site design, we will complete and document a survey for our proposed project that will include all of the following information related to the site:

- **Topography.** Contour mapping, unique topographic features, slope stability risks.
- **Hydrology.** Flood hazard areas, delineated wetlands, lakes, streams, shorelines, rainwater collection and reuse opportunities, TR-55 initial water storage capacity of the site (or local equivalent for projects outside the U.S.).
- **Climate.** Solar exposure, heat island effect potential, seasonal sun angles, prevailing winds, monthly precipitation and temperature ranges.
- **Vegetation.** Primary vegetation types, greenfield area, significant tree mapping, threatened or endangered species, unique habitat, invasive plant species.
- **Soils.** Natural Resources Conservation Service soils delineation, U.S. Department of Agriculture prime farmland, healthy soils, previous development, disturbed soils (local equivalent standards may be used for projects outside the U.S.).
- **Human use.** Views, adjacent transportation infrastructure, adjacent properties, construction materials with existing recycle or reuse potential.
- **Human health effects.** Proximity of vulnerable populations, adjacent physical activity opportunities, proximity to major sources of air pollution.

Satisfying this credit will earn 1 LEED point.

### *Heat Island Reduction*

The intent is to minimize effects on microclimates and human and wildlife habitats by reducing heat islands. In order to complete this requirement, our site must comply with the formula below:

$$\begin{array}{ccccccc}
 \begin{array}{c} \text{Area of} \\ \text{Nonroof} \\ \text{Measures} \end{array} & & \begin{array}{c} \text{Area of High-} \\ \text{Reflectance Roof} \end{array} & & \begin{array}{c} \text{Area of} \\ \text{Vegetated Roof} \end{array} & & \\
 \hline
 0.5 & + & 0.75 & + & 0.75 & \geq & \begin{array}{c} \text{Total Site} \\ \text{Paving Area} \end{array} + \begin{array}{c} \text{Total Roof Area} \end{array}
 \end{array}$$

Our site will achieve this by using trees around the site that will remain to shade some of the site while also using high-reflective roofing systems on all of the storage unit buildings. Satisfying this credit will earn 2 LEED points.

## WATER EFFICIENCY

### *Outdoor Water Use Reduction (Required)*

The intent of this prerequisite is to reduce the outdoor water consumption of our proposed project. In order to achieve this requirement, we will show that our proposed project will not require irrigation.

### *Indoor Water Use Reduction (Required)*

The intent of this prerequisite is to reduce the indoor water consumption on our site. In order to fulfill this requirement, all fixtures and fittings will reduce water consumption by 20%, and we must abide by Tables 1-5 of the Indoor Water Use Reduction section of the LEED v4 for Building Design and Construction.

### *Building-Level Water Metering (Required)*

The intent of this prerequisite is to support water management and identify opportunities for additional water savings by tracking water consumption. In order to comply with the requirement, we will install permanent water meters that measure the total potable water use for the building and associated grounds.

### *Outdoor Water Use Reduction*

The intent of this prerequisite is to reduce the outdoor water consumption of our proposed project. In order to achieve this requirement, we will show that our proposed project will not require irrigation. We will do this by using local trees that will have enough supply of water from the rainfall in the area. Satisfying this credit will earn 2 LEED points.

### *Indoor Water Use Reduction*

The intent of this prerequisite is to reduce the indoor water consumption on our site. In order to fulfill this requirement, all fixtures and fittings must reduce water consumption by 20%, and we must abide by Tables 1-5 of the Indoor Water Use Reduction section of the LEED v4 for Building Design and Construction. In order to satisfy the credit requirement, we will reduce the water use for our proposed site by 50%. Satisfying this credit will earn 6 LEED points.

### *Water Metering*

In order to support water management and identify opportunities for additional water savings by tracking water consumption, we will install permanent water meters for two or more of the following subsystems for our proposed project:

- **Irrigation.** Meter water systems serving at least 80% of the irrigated landscaped area. Calculate the percentage of irrigated landscape area served as the total metered irrigated landscape area divided by the total irrigated landscape area. Landscape areas fully covered with xeriscaping or native vegetation that requires no routine irrigation may be excluded from the calculation.
- **Indoor plumbing fixtures and fittings.** Meter water systems serving at least 80% of the indoor fixtures and fitting described in WE Prerequisite Indoor Water Use Reduction, either directly or by deducting all other measured water use from the measured total water consumption of the building and grounds.
- **Domestic hot water.** Meter water use of at least 80% of the installed domestic hot water heating capacity (including both tanks and on-demand heaters).
- **Boiler with aggregate projected annual water use of 100,000 gallons (378 500 liters) or more, or boiler of more than 500,000 BtuH (150 kW).** A single makeup meter may record flows for multiple boilers.
- **Reclaimed water.** Meter reclaimed water, regardless of rate. A reclaimed water system with a makeup water connection must also be metered so that the true reclaimed water component can be determined.
- **Other process water.** Meter at least 80% of expected daily water consumption for process end uses, such as humidification systems, dishwashers, clothes washers, pools, and other subsystems using process water.

Satisfying this credit will earn 1 LEED point.

## ENERGY AND ATMOSPHERE

### *Fundamental Commissioning and Verification (Required)*

The intent of this prerequisite is to support the design, construction, and eventual operation of a project that meets the owner's project requirements for energy, water, indoor environmental quality, and durability. In order to fulfill this requirement our project will complete all commissioning process activities mechanical, electrical, plumbing, and renewable energy systems in accordance with ASHRAE Guidelines. By the end of the design development phase, we will engage a commission with all of the required qualifications, and prepare and maintain a facilities requirements, operations and maintenance plan.

### *Minimum Energy Performance (Required)*

The intent of this prerequisite is to reduce the environmental and economic harms of excessive energy use by achieving a minimum level of energy efficiency for the building and its systems. We will demonstrate a 5% improvement in the proposed building performance compared to the baseline in order to satisfy the requirement.

### *Building-Level Energy Metering (Required)*

The intent of this prerequisite is to support energy management and identify opportunities for additional energy savings by tracking building-level energy use. This requirement will be satisfied by installing new building-level energy meters in our proposed project.

### *Fundamental Refrigerant Management (Required)*

The intent of this prerequisite is to reduce stratospheric ozone depletion. In order to comply with the requirement, we will not use chlorofluorocarbon based refrigerants in new heating, ventilating, air-conditioning, and refrigeration systems in the project.

### *Enhanced Commissioning*

In order to further support the design, construction, and eventual operation of a project that meets the owner's project requirements for energy, water, indoor environmental quality, and durability, our project will complete the following commissioning process activities for mechanical, electrical, plumbing, and renewable energy systems and assemblies in accordance with ASHRAE Guidelines:

The commissioning authority must do the following:

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

Satisfying this credit will earn 3 LEED points

#### *Optimize Energy Performance*

The intent is to achieve increasing levels of energy performance beyond the prerequisite standard to reduce environmental and economic harms associated with excessive energy use. In order to earn points for this credit, our project will achieve a 35% reduction in the energy performance when compared to the baseline. Satisfying this credit will earn 14 LEED points.

#### *Enhanced Refrigerant Management*

The intent of this credit is to reduce ozone depletion and support early compliance with the Montreal Protocol while minimizing direct contributions to climate change. Our project will fulfill this credit by using only refrigerants that have an ozone depletion potential of zero and a global warming potential of less than 50. Satisfying this credit will earn 1 LEED point.

### MATERIALS AND RESOURCES

#### *Storage and Collection of Recyclables (Required)*

The intent of this prerequisite is to reduce the waste that is generated by building occupants and hauled to and disposed of in landfills. In order to satisfy this requirement our site will provide dedicated areas accessible to waste haulers and building occupants for the collection and storage of recyclable materials for the entire building.

#### *Construction and Demolition Waste Management Planning (Required)*

The intent of this prerequisite is to reduce construction and demolition waste disposed of in landfills and incineration facilities by recovering, reusing, and recycling materials. The project will comply with this requirement by developing and implementing a construction and demolition waste management plan. We will also provide a final report detailing all major waste streams generated.

#### *Construction and Demolition Waste Management*

The intent is to reduce construction and demolition waste disposed of in landfills and incineration facilities by recovering, reusing, and recycling materials. In compliance with this credit, our project will divert 75% of our total construction and demolition material, and this will be diverted via four separate material streams. Satisfying this credit earns 2 LEED points.

### INDOOR ENVIRONMENT QUALITY

#### *Minimum Indoor Air Quality Performance (Required)*

The intent of this prerequisite is to contribute to the comfort and well-being of building occupants by establishing minimum standards for indoor air quality. In order to satisfy the



requirement, the project must meet the requirements for both ventilation and monitoring as outlined by ASHRAE Standards.

#### *Environmental Tobacco Smoke Control (Required)*

The intent of this prerequisite is to prevent or minimize exposure of building occupants, indoor surfaces, and ventilation air distribution systems to environmental tobacco smoke. In order to comply with the requirement, our site will prohibit smoking inside the building, as well as outside the building within 25 feet.

#### *Enhanced Indoor Air Quality Strategies*

The intent is to promote occupants' comfort, well-being, and productivity by improving indoor air quality. To fulfill this requirement, our proposed project will comply with all of the following, if applicable:

##### **A. Entryway Systems**

Install permanent entryway systems at least 10 feet (3 meters) long in the primary direction of travel to capture dirt and particulates entering the building at regularly used exterior entrances. Acceptable entryway systems include permanently installed grates, grilles, slotted systems that allow for cleaning underneath, rollout mats, and any other materials manufactured as entryway systems with equivalent or better performance. Maintain all on a weekly basis.

##### Warehouses & Distribution Centers only

Entryway systems are not required at doors leading from the exterior to the loading dock or garage but must be installed between these spaces and adjacent office areas.

##### **B. Interior Cross-Contamination Prevention**

Sufficiently exhaust each space where hazardous gases or chemicals may be present or used (e.g., garages, housekeeping and laundry areas, copying and printing rooms), using the exhaust rates determined in EQ Prerequisite Minimum Indoor Air Quality Performance or a minimum of 0.50 cfm per square foot (2.54 l/s per square meter), to create negative pressure with respect to adjacent spaces when the doors to the room are closed. For each of these spaces, provide self-closing doors and deck-to-deck partitions or a hard-lid ceiling.

##### **C. Filtration**

Each ventilation system that supplies outdoor air to occupied spaces must have particle filters or air-cleaning devices that meet one of the following filtration media requirements:

- minimum efficiency reporting value (MERV) of 13 or higher, in accordance with ASHRAE Standard 52.2–2007; or
- Class F7 or higher as defined by CEN Standard EN 779–2002, Particulate Air Filters for General Ventilation, Determination of the Filtration Performance.

Replace all air filtration media after completion of construction and before occupancy.

##### **D. Natural Ventilation Design Calculations**

Demonstrate that the system design for occupied spaces employs the appropriate strategies in Chartered Institution of Building Services Engineers (CIBSE) Applications Manual AM10, March 2005, Natural Ventilation in Non-Domestic Buildings, Section 2.4.

##### **E. Mixed-Mode Design Calculations**

Demonstrate that the system design for occupied spaces complies with CIBSE Applications Manual 13–2000, Mixed Mode Ventilation.

**A. Exterior Contamination Prevention**

Design the project to minimize and control the entry of pollutants into the building. Ensure through the results of computational fluid dynamics modeling, Gaussian dispersion analyses, wind tunnel

modeling, or tracer gas modeling that outdoor air contaminant concentrations at outdoor air intakes are below the thresholds listed in Table 1 (or local equivalent for projects outside the U.S., whichever is more stringent).

Table 1. Maximum concentrations of pollutants at outdoor air intakes

Pollutants	Maximum concentration	Standard
Those regulated by National Ambient Air Quality Standards (NAAQS)	Allowable annual average OR 8-hour or 24-hour average where an annual standard does not exist OR Rolling 3-month average	National Ambient Air Quality Standards (NAAQS)

**B. Increased Ventilation**

Increase breathing zone outdoor air ventilation rates to all occupied spaces by at least 30% above the minimum rates as determined in EQ Prerequisite Minimum Indoor Air Quality Performance.

**C. Carbon Dioxide Monitoring**

Monitor CO<sub>2</sub> concentrations within all densely occupied spaces. CO<sub>2</sub> monitors must be between 3 and 6 feet (900 and 1 800 millimeters) above the floor. CO<sub>2</sub> monitors must have an audible or visual indicator or alert the building automation system if the sensed CO<sub>2</sub> concentration exceeds the setpoint by more than 10%. Calculate appropriate CO<sub>2</sub> setpoints using methods in ASHRAE 62.1–2010, Appendix C.

**D. Additional Source Control and Monitoring**

For spaces where air contaminants are likely, evaluate potential sources of additional air contaminants besides CO<sub>2</sub>. Develop and implement a materials-handling plan to reduce the likelihood of contaminant release. Install monitoring systems with sensors designed to detect the specific contaminants. An alarm must indicate any unusual or unsafe conditions.

**E. Natural Ventilation Room-by-Room Calculations**

Follow CIBSE AM10, Section 4, Design Calculations, to predict that room-by-room airflows will provide effective natural ventilation.

Satisfying this requirement earns 2 LEED points.

**Construction Indoor Air Quality Management Plan**

The intent of this credit is to promote the well-being of construction workers and building occupants by minimizing indoor air quality problems associated with construction and renovation. In order to comply with the credit and earn a point, our project will develop and implement an indoor air quality management plan for the construction and preoccupancy phases of the building. The plan will address all of the following:



During construction, meet or exceed all applicable recommended control measures of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines for Occupied Buildings under Construction, 2nd edition, 2007, ANSI/SMACNA 008–2008, Chapter 3.

Protect absorptive materials stored on-site and installed from moisture damage.

Do not operate permanently installed air-handling equipment during construction unless filtration media with a minimum efficiency reporting value (MERV) of 8, as determined by ASHRAE 52.2–2007, with errata (or equivalent filtration media class of F5 or higher, as defined by CEN Standard EN 779–2002, Particulate Air Filters for General Ventilation, Determination of the Filtration Performance), are installed at each return air grille and return or transfer duct inlet opening such that there is no bypass around the filtration media. Immediately before occupancy, replace all filtration media with the final design filtration media, installed in accordance with the manufacturer's recommendations.

Prohibit the use of tobacco products inside the building and within 25 feet (7.5 meters) of the building entrance during construction.

Satisfying this requirement earns the project 1 LEED point.

#### *Indoor Air Quality Assessment*

The intent is to establish better quality indoor air in the building after construction and during occupancy. In order to comply with the credit requirement, before occupancy we will install new filtration media and perform a building flush-out by supplying a total air volume of 14,000 cubic feet of outdoor air per square foot of gross floor area while maintaining an internal temperature of at least 60°F and no higher than 80°F and relative humidity no higher than 60%. Satisfying this credit will earn 1 LEED point.

#### *Interior Lighting*

The intent of this credit is to promote occupants' productivity, comfort, and well-being by providing high-quality lighting. In order to earn this credit, our project will provide individual lighting controls that enable occupants to adjust the lighting to suit their individual tasks and preferences, with at least three lighting levels or scenes for at least 90% of the project occupant space.

### INNOVATION

#### *LEED Accredited Professional*

The intent is to encourage the team integration required by a LEED project and to streamline the application and certification process. In order to comply, our project will have at least one LEED Accredited Professional working as a principal participant.