



The Universities of Wisconsin Sustainable Building Guidelines

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1. Purpose of Guidelines

Board of Regents policy RPD 19-15, [Physical Development Principles](#), incorporates Sustainable Design principles. The UW Sustainable Building Guidelines define specific actions and targets to achieve the sustainable design principles outlined in RPD 19-15.

These sustainable building guidelines apply to all Universities of Wisconsin New Construction and Major Renovation (NC/MR) projects in the Tier 2 category (project budgets greater than \$3 million). New Construction and Major Renovations include “a new building, an addition, or an existing building with conditioned space where the scope of work includes two or more of the three systems: mechanical, electrical, or envelope.”

These guidelines complement and support the Department of Administration’s [Division of Facilities Development \(DFD\) Sustainability Guidelines for Capital Projects](#), Version 6 (July 22, 2024). The UW Sustainable Building Guidelines include and require many actions that are mandatory or encouraged in the DFD Sustainability guidelines.

Projects should meet or exceed the requirements of the approved version of the UW Sustainable Building Guidelines in place on the date the request for consultant services is posted.

2. Publishing Office

The Universities of Wisconsin Administration Office of Capital Planning and Budget (CPB)

3. Affected Stakeholders on Campus

The Universities of Wisconsin Chief Business Officers and Facilities Planning and Management offices.

4. Primary Responsibility

Facilities Planning and Management offices at the Universities of Wisconsin are responsible for incorporating the Sustainable Building Guidelines into their project planning, Architect/Engineer Requests and Capital Budget requests, and for ensuring that project teams follow the guidelines through the design, construction and operation of major capital projects.

Project design teams shall report on sustainability measures through a design report appendix and/or documentation submitted during review phases of a project. Final documentation of sustainability measures shall be submitted within a month of Substantial Completion.

The Office of Capital Planning and Budget will support project teams as they implement these guidelines with budgeting guidance, research, data collection, and communication of best practices. The Office of Capital Planning and Budget will review project documentation and develop reports that include key sustainable building performance metrics and project features.

5. Guidelines

A. Optimize use of existing facilities and right-size/minimize new construction

- I. **New Net Square Footage Prerequisite** Requests for new assignable square footage must meet criteria [identified in Board of Regents Resolution 11994 \(adopted 2/10/2023\)](#). Each institution must provide demonstrated proof that no other appropriate facilities are available to accommodate the proposed expansion needs.
- II. **Right-size building space**
 1. Right-size the project so that programming is incorporated, but not over-inflated, and the design supports flexible use over the lifetime of the project. Benchmarking (square feet and cost per square feet) against other similar local and regional facilities is encouraged. *(DFD Sustainability Measure 5: Designing for Economy, Mandatory item #3)*
 2. Recognize that the volume of building space correlates with operational cost and energy use over future decades. Use alternative and forward-thinking approaches to considering and meeting space needs, including sharing and scheduling, to ensure that use of all square footage justifies its capital, operational and environmental costs.
- III. **Right-size exterior hardscape** Minimize paving and other impervious surfaces to protect greenfield site areas and maximize pervious areas for stormwater infiltration. Right-size walkways, parking developments, and building footprints to maintain or improve stormwater infiltration and other greenspace benefits. *(DFD Sustainability Measure 4: Designing for Water, Encouraged item #4)*
- IV. **Existing Building Evaluation** During advanced planning, evaluation of an existing building for renovation or demolition/replacement should include analysis of the total carbon impacts. Utilize assessments such as the CARE tool developed by Architecture 2030 to evaluate and compare the embodied and operational carbon emissions of renovation versus new construction.

B. Use energy, water and materials wisely and efficiently

I. Energy

1. **ANSI/ASHRAE/IESNA Standard 90.1–2022** Meet or exceed the requirements of ANSI/ASHRAE/IESNA Standard 90.1–2022 (*DFD Sustainability Measure 6: Designing for Energy, Mandatory item #1*)
2. **Energy Use Intensity (EUI)** The design shall not exceed the Energy Use Intensity (“EUI”, kBTU/ft²/year) for the appropriate building category as displayed in the DFD Sustainability Guidelines. (*DFD Sustainability Measure 6: Designing for Energy, Mandatory item#4b*)
 - a. Office/Conference Room
 - a. New construction: 49 kBTU/ft²/year
 - b. Major renovation: 65 kBTU/ft²/year
 - b. Classroom: 45 kBTU/ft²/year
 - a. New construction: 45 kBTU/ft²/year
 - b. Major renovation: 60 kBTU/ft²/year
 - c. Classic Style Residence Hall with AC
 - a. New construction: 64/68 kBTU/ft²/year (*Climate Zone 5A/6A*)
 - b. Major renovation: 85/90 kBTU/ft²/year (*Climate Zone 5A/6A*)
 - d. Suite Style Residence Hall with AC
 - a. New construction: 68/71 kBTU/ft²/year (*Climate Zone 5A/6A*)
 - b. Major renovation: 90/95 kBTU/ft²/year (*Climate Zone 5A/6A*)
3. **Laboratory EUI benchmarking** For lab buildings, use the I2SL [Laboratory Benchmarking Tool](#) to benchmark site EUI against measured data of peer facilities and assess an [Energy Score](#) based on the anticipated energy use.
4. **Building-level energy metering** Install new or use existing building-level energy meters, or submeters that can be aggregated to provide building-level data representing total building energy consumption (electricity, natural gas, chilled water, steam, fuel oil, propane, biomass, etc.). Utility-owned meters capable of aggregating building-level resource use are acceptable. At a minimum, energy consumption must be tracked at one-month intervals. (*DFD Sustainability Measure 6: Designing for Energy, Mandatory item #6*)

5. **Commissioning** Project teams should request and budget for Level 2 Commissioning (DFD projects) or enhanced commissioning services (UW-Managed projects) for building systems and envelope. Systems to be commissioned shall be discussed with DFD Technical Services or UW Managed Team prior to Commissioning Authority selection. The Universities of Wisconsin shall reference the Capital Budget instructions when budgeting for these services. *(DFD Sustainability Measure 6: Designing for Energy, Mandatory item #12)*
6. **Verify energy use in operation** The Commissioning Authority shall verify the entering of monthly utility data for the first 12 months of operation by facilities staff. Provide 6-month and 12-month reports on utility usage and compare to design targets established by the design team. Highlight and account for any major discrepancies. If discrepancies are greater than 10%, verify on-site operation of systems and resolve any identified issues. *(DFD Sustainability Measure 6: Designing for Energy, Mandatory item #7)*

II. Water

1. **Water efficiency** Predict and reduce indoor water use. (a) Typical buildings: 25% reduction in water use compared to flow rates in the Energy Policy Act of 1992. The aggregate expected building usage using fixtures in the DFD master plumbing specifications exceed this requirement. (b) For projects with high-process usage (such as pools, on site chillers, or commercial kitchens) document best practices, model water usage, and exceed 10% savings. *(DFD Sustainability Measure 4: Designing for Water, Mandatory item #5)*
2. **Restrict use of potable water for permanent irrigation** (a) Provide planting palettes which do not require permanent irrigation. (b) If irrigation is desired, use roof water or captured rainwater in lieu of potable water. (c) Permanent irrigation and hose bibbs may be provided for green roofs. *(DFD Sustainability Measure 4: Designing for Water, encouraged item #3)*. Or reduce the project's landscape water requirement by at least 30% from the calculated baseline for the site's peak watering month. Reductions must be achieved through plant species selection and irrigation system efficiency, as calculated by the Environmental Protection Agency (EPA) WaterSense Water Budget Tool.

III. Materials

1. **Reduce and recycle construction and demolition waste** Target a minimum diversion rate of 75% of construction and demolition waste materials. For DFD projects, Architect will enter target diversion rate into DFD Master Specification, 01 74 19 Construction Waste Management. *(DFD Sustainability Measure 8: Designing for Resources, encouraged item #3)*

C. Protect the health and well-being of building occupants

- I. **Minimum Ventilation Rates and Indoor Air Quality Performance** Meet the requirements of ASHRAE Standard 62.1–2016, “Ventilation for Acceptable Indoor Air Quality.”
- II. **Provide quality air filtration** In ventilation system, require particle filters or air cleaning device with minimum efficiency reporting value (MERV) of 13 or higher (with exception for renovations with space constraints). Health and Research spaces remain at MERV 14. Replace all air filtration media after completion of construction and before occupancy.
- III. **Specify Low VOC Materials** Use materials on the building interior that meet low-emitting criteria.
 1. Specify Paints and Coatings, and Adhesives and Sealants that meet VOC content limits identified in LEED. These are detailed in these standards: California Air Resource Board (CARB) 2007 Suggested Control Measure (SCM) for Architectural Coatings; South Coast Air Quality Management District (SCAQMD) Rule 1113, amended February 5, 2016, effective date most current at the time of the project; and SCAQMD Rule 1168, amended November 4, 2022, effective date most current at the time of the project. *(DFD Sustainability Measure 7: Designing for Wellness, encouraged item #2a)*
 2. Target at least 90% of all flooring, by cost or surface area, to be low VOC or inherently non-emitting, or salvaged and reused materials. To determine low VOC, consult [certifications and programs that use California Department of Public Health \(CDPH\) Standard Method v1.2–2017](#) and the VOC limits in Table 4-1 of the method *(DFD Sustainability Measure 7: Designing for Wellness, encouraged item #2b)*
- IV. **Choose low-emitting furniture** Review emissions evaluations and certifications when selecting furniture, and choose low emission options when available. To identify low VOC, look for products tested in accordance with ANSI/BIFMA Standard Method M7.1–2011 (R2016) and complying with ANSI/BIFMA e3-2014e or e3-2019e Furniture Sustainability Standard, Sections 7.6.1, 7.6.2, OR 7.6.2 AND 7.6.3. *(DFD Sustainability Measure 7: Designing for Wellness, encouraged item #3)*
- V. **Construction measures to protect future indoor air quality** Contractor to implement measures to protect materials and equipment from moisture and contaminants, according to DFD Specifications and industry best practices. *(DFD Sustainability Measure 7: Designing for Wellness, encouraged item #4)*
- VI. **Indoor air quality at occupancy** With AE guidance, universities will develop ventilation plans for post-substantial completion and initial occupancy that ensure air quality and adequate flush-out. This may require temporary modification of controls.

D. Promote decarbonization of infrastructure and buildings through energy and materials choices

I. Beneficial Electrification

1. **Electrification-ready** Evaluate equipment and system options for electrification, choosing options with no on-site combustion, or planning ahead for the space, power and other needs of electrification of equipment over the life of the building.
2. **Design building at lower hot water temperatures** Task project AE teams with studying the impacts, future electrification options and cost benefits of heating hot water systems with temperatures at or below 130 degrees.
3. **Air-tight building envelope**
 - a. To ensure adequate air tightness of building envelope, designate one layer of the assembly as the air barrier and ensure that this layer is continuous, with all seams and transitions taped, and all penetrations filled. Where practical, use a blower door test to verify the building's air tightness, both for mockups and for the whole building. The need for blower door testing will be determined by the DFD Project Manager or UW Managed Team in consultation with the university. *(DFD Sustainability Measure 6: Designing for Energy, Mandatory item #10)*
 - b. Air leakage testing (also known as blower door or air barrier testing) is mandatory on all new construction.
 - c. It is recommended that glazing work be performed by contractors and technicians certified according to industry standards, such as the North American Contractor Certification Program for Architectural Glass and Metal Contractors (NACC) and the Architectural Glass and Metal Technician (AGMT) certification program.
4. **Reduce heating and cooling loads** During the energy modeling process and design choices, prioritize measures that reduce annual and peak heating and cooling loads, to support future electrification.

II. **Electric Vehicle Ready** If parking for vehicles or other moving equipment (such as mowers, forklifts) is part of project, consult with campus departments to determine possible future electric charging needs.

III. **Renewable Energy** All Tier 2 New Construction projects shall provide an on-site solar energy system that makes maximum use of available roof area or provides at least 5% of building's annual energy consumption from on-site renewable energy sources.

IV. Reduce Embodied Carbon Materials

1. Perform a Life Cycle Assessment (LCA) that tracks embodied carbon. Identify tools used and summarize results. *(DFD Sustainability Measure 8: Designing for Resources, mandatory item #4)*
2. UW projects should use the LCA required by DFD Sustainability Guidelines early in the planning and design process to inform structural system decisions. Document actions taken to reduce the carbon emissions embodied in building materials through both design and material choices.

E. Design buildings ready for extremes of changing climate

- I. **Plan and design in anticipation of future climate risks** During planning and budgeting, identify observed, projected, and future natural hazards and assess relevant effects to the project site and building function.
- II. **Reduce heat island effect** Reduce heat gain of the site by shading, limiting impermeable surfaces, and choosing hardscape materials with high reflectance. Shade outdoor sidewalks, seating areas, bike paths, roadways, parking lots, and other impervious surfaces. Consider local heat island concerns when selecting roof material, including reducing urban heat island effect by providing a green roof.

III. Anticipate future extreme water events, safe overflow

1. First floor elevations of occupiable structures must be set 24 inches above the 100-year floodplain elevation or flood-proofed with a back-up system. *(DFD Sustainability Measure 4: Designing for Water, Mandatory Requirement #4a)*
2. Development should not occur in 100-year floodplain (as defined by 44 CFR 59, development includes buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials. This definition includes culverts, bridges and roads.) *(DFD Sustainability Measure 4b: Designing for Water, Mandatory Requirement #4b)*
3. The project should document the drainage patterns and overland flow routes. *(DFD Sustainability Measure 4: Designing for Water, Mandatory Requirement #4c)*
4. Consult flood and excessive precipitation risk assessments beyond FEMA flood maps and NOAA Atlas 14 when siting and determining elevation of first floor, elevator pits and major equipment.

- IV. **Stormwater: Peak Discharge** (a) New Development (i) Detain the 1, 2, 5, 10, and 100-year storm events such that the post development peak discharge rates cubic feet per second (CFS) match the pre-development peaks for each listed storm; (ii) Or abide by the local ordinances, whichever is more stringent.; (b) Redevelopment:

If the proposed site has an impervious area (hard surface) that exceeds 80% of the existing site impervious area, see DFD Sustainability Guidelines for specific targets and procedures. *(DFD Sustainability Measure 4, Designing for Water, encouraged item #1)*

F. Provide opportunities for sustainability education, research, and operations

- I. Design for material flows, recycling and reuse** During design, review how materials will enter and leave the building, including recycling system design. Include appropriate hands-on operational staff as part of design team in planning material flows and building operations during the planning and design process. Provide dedicated areas accessible to building occupants and waste haulers for the collection and storage of reusable, compostable and recyclable materials, including items specific to occupant activities. No trash chutes.
- II. Anticipate operations & maintenance needs.** Evaluate operation and maintenance needs when specifying products and systems that are new to the institution.
- III. Bird collision deterrence** For facades with greater than 20% glazing: At lowest two stories or tree canopy height, whichever is greater: Incorporate bird-deterrent strategies such as a properly designed scrim, glazing frit, or specialized coating to reduce non-treated glazing to a maximum of 20% in this zone. Treatments should be prioritized to occur within the canopy zone. At green roof level glazing: apply deterrent design strategies to glazing surrounding and adjacent to green roof surface. Reference [Bird Friendly Design Guide](#) for potential strategies and detailed information. *(DFD Sustainability Measure 3: Designing for Ecology, Mandatory item #3)*
- IV. Educational tours and training**
 - 1.** Provide educational tours and training for building management, occupants, and visitors on their roles and responsibilities for maintaining building performance as defined in the design documents. Define feedback mechanisms so lessons learned can be integrated into future projects. *(DFD Sustainability Measure 10: Designing for Discovery, Encouraged item 2)*
 - 2.** Document tours and training and make available for future managers, occupants and visitors. If AE participation is desired, include in budget and schedule.
- V. Case studies shared publicly** Work with Sustainability staff to produce and make available case studies sharing project's sustainability features and metrics.

6. Contact

The Universities of Wisconsin Administration, Office of Capital Planning and Budget

7. Guideline History

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8. Scheduled Review

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