



Division of Facilities Development

Sustainability Guidelines for Capital Projects

July 22, 2024

Version 6.0

***THIS GUIDELINE APPLIES TO ALL DFD PROJECTS THAT HAVE A
REQUEST FOR CONSULTANT SERVICES POSTED ON OR AFTER
October 2020**

Table of Contents

Introduction	3
Applicability	3
Conflict Resolution	4
Deliverables	4
Measure 1: Designing for Integration	5
Measure 2: Designing for Equitable Communities	6
Measure 3: Designing for Ecology.....	9
Measure 4: Designing for Water.....	11
Measure 5: Designing for Economy	13
Measure 6: Designing for Energy.....	13
Measure 7: Designing for Wellness.....	18
Measure 8: Designing for Resources	21
Measure 9: Designing for Change.....	23
Measure 10: Designing for Discovery.....	24

Introduction

The Wisconsin Division of Facilities Development (DFD) Sustainability Guidelines are based on the American Institute of Architect's (AIA) [Framework for Design Excellence](#) and adapted for use on DFD projects to align with Governor Evers Executive Order #38 to "Develop energy efficiency, sustainability and renewable energy guidelines for all new and existing state facilities, office buildings, and complexes." The intent of these guidelines is to provide a holistic approach to sustainability by evaluating multiple measures for applicability to capital projects as they are relevant to our customer's varying project needs and missions. These guidelines are part of a larger effort towards a more sustainable environment today and for future generations.

This document will routinely be reviewed by DFD staff and stakeholders to ensure the Sustainability Guidelines are kept relevant by balancing the dynamic nature of our environment, technologies and other pertinent social economic forces that affect development and redevelopment in Wisconsin. These sustainability efforts are meant to be as functional and complementary as they are sustainable. Should you have comments or questions specific to this document, please consult with your DFD Project Manager or email: SustainabilityDFDM@wisconsin.gov.

Applicability

The applicable guidelines are based on the project's scope of work and overall project budget. Sustainability Guidelines align with the [DFD Policies and Procedures Manual \(PPM\)](#) and the [Master Specifications and Design Guidelines](#).

Project Type	Definition	Tier 1	Tier 2
New Construction or Major Renovation (NC/MR)	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, envelope.	< \$3M	> \$3M
Tenant Improvement (TI)	Any existing space that does not meet criteria for major renovation	< \$1M	> \$1M
Site and Civil (SC)	Any landscape or underground work which impacts the land and does not replace the disturbed area in-kind.	< \$1M	> \$1M
Equipment Replacement (ER)	Replaced Equipment shall meet all applicable sustainability guidelines	< \$300k	> \$300k

1. It is recommended that all projects, regardless of size and type, be evaluated against these Guidelines during agency scope development and approval.
2. For work on existing buildings (MR, TI, and ER project types), only the systems that are altered are required to meet these guidelines.

Conflict Resolution

In the event the Sustainability Guidelines conflict with other policies, procedures, or the Master Specifications/Design Guidelines, the more stringent of the conflicting requirements will govern.

If the project cannot accommodate any criteria within each measure due to a hardship or other unforeseen circumstance, the A/E/Consultant team shall notify the DFD Project Manager (PM) in writing and provide documented justification as to why the project cannot meet the guideline and any suggested accommodations. The DFD PM will consult with DFD leadership to determine whether a variance to a certain requirement will be issued.

Deliverables

Documentation is required for each applicable sustainability measure and shall be submitted for Preliminary Review and updated for Final Review. Final documentation of sustainability measures shall be submitted within a month of Substantial Completion. Documentation is to be compiled and included in the Design Report Appendix, when applicable (PPM Section 4.K.1.a and 4.K.3) or uploaded to SharePoint for projects that do not require a Design Report Appendix.

The guidelines contain **Mandatory Requirements**, which projects must include and **Encouraged Measures**, which should be considered as part of a comprehensive sustainability plan for the applicable facility or site.

Measure 1: Designing for Integration

Good design elevates any project, no matter how small, with a thoughtful process that delivers both beauty and function in balance. It is the element that binds all the measures together with a big idea.

Mandatory on all projects except Equipment Replacement.

1. A meeting at the beginning of the project with the entire team to integrate sustainability guidelines into the project vision. This team includes (at a minimum) the key project stakeholders: Prime A/E representative, MEP engineer representative as applicable, DFD Project Manager, Agency Contact, a representative from each user group or department.
 - a. NC/MR: Meeting at the start of design
 - b. TI/SC: Meeting at the start of design
2. A narrative (roughly 200-400 words per measure) that demonstrates how each of the sustainability criteria will be incorporated in the project. It includes project goals, objectives, and potential challenges or conflicts.

For additional Best Practices, High Impact Approaches, Resources, and Project Case Studies for the **Designing for Integration** measure, please view the additional relevant information at the following link: <https://www.aia.org/showcases/6082344-designing-for-integration>

Measure 2: Designing for Equitable Communities

Good design positively impacts future occupants and the larger community.

For all TI and Tier 1 NC/MR/SC projects:

1. Track and document the project's [WalkScore](#) in the earliest design phase.
2. Track and document the project's level of engagement using: [Arnstein's Ladder of Citizen Participation](#).
3. Use the Simple Transportation Carbon Calculator found on the Committee on the Environment ([COTE Super Spreadsheet](#)) to anticipate the pounds of carbon dioxide emitted per occupant per year. Use a survey (or an educated guess) to determine the average commuting distance and average mpg of the building's occupants. If no information is available, use the baseline (US national average).

For all Tier 2 NC/MR/SC projects, address all items listed above, including the following:

1. Provide bike racks within 100 yds of the project's primary entry. Minimum quantities based on building type or land use (choose one):
 - a. Residential: 0.5 space per residential unit
 - b. Office/Workplace/Laboratory: 1 space per 2000 square feet
 - c. Classroom: 1 space per 4 students
 - d. For categories not specified above, provide 1 space per 2000 square feet

For all Tier 2 NC/MR projects, all items listed above, including the following:

1. Provide (1) mother's room per the first 200 occupants, and additional capacity for each additional 200 occupants, which may be additional mothers rooms or a design which provides multiple private areas for pumping/nursing and a shared washing and storage area. The mother's room shall meet the following minimum requirements (Reference WELL v2 C09 for a summary of the Issue and Impact):
 - a. ADA accessible and including all components noted herein (typically requires approx. 7 ft x 7 ft footprint)
 - b. Single, dedicated function – e.g. not shared space with a Wellness Room
 - c. Minimum single basin sink minimum 9 inch in width and length for hand washing and equipment washing including an adequate faucet, minimum 3 inches from any edge of sink with 10-inch minimum column of water
 - d. Paper towels, soap, waste bin
 - e. Chair and adjacent minimum 30 inches wide x 20 inches deep open below counter space, work surface, or tabletop for pump and bottles to rest on while in use, (2) minimum receptacles adjacent, ideally at counter height
 - f. Microwave optional yet beneficial for equipment sanitization
 - g. If the space serves a work area with full-time employees (FTE), system in place for booking / scheduling designed to account for privacy, e.g. by using an occupant number in lieu of name if occupant prefers.
 - h. A refrigerator with dedicated and sufficient space for milk storage based on assessment of occupant storage need for regular building occupants.
 - i. Dedicated storage space for pumps and pumping supplies (e.g. shelving, base cabinets, or lockers)

- j. If the space serves an area with FTE, consider additional shelf or counter space for equipment drying
 - k. Door to pumping/nursing area that is lockable from the interior with indication of 'in use' or similar message that is visible from the exterior
 - l. Acoustic and visual privacy to adjacent occupied space. While visual privacy is required, daylight and views are beneficial, such as through translucent glazing or to an exterior unoccupied area. If any transparent or translucent glazing is present, user-controlled window coverings are required.
 - m. Mother's Room requirement shall not apply to the Universities of Wisconsin residence hall projects, regardless of project size/budget.
2. For projects with occupancy over 50 FTE, provide (1) wellness room minimum. The purpose of this space is cognitive or physical restoration and recovery, related to mental or physical health needs. (Reference WELL v2 M07 for summary of Issue and Impact)
 - a. Designated for a function of restoration (not a work area, not a mother's room)
 - b. Minimum 75 square feet
 - c. Fully ADA accessible
 - d. Dimmable light levels (user-controlled)
 - e. Acoustic and visual privacy to adjacent occupied space. While visual privacy is required, daylight and views are beneficial, such as through translucent glazing or to an exterior unoccupied area. If any transparent or translucent glazing is present, user-controlled window coverings are required.
 3. Seating arrangements which accommodate a range of user-preferences and activities (e.g. movable lightweight chairs, comfortable chair(s), cushions, mats). All spaces which include a restroom shall provide minimum (1) all gender single-user restroom that meets the following requirements. Coordinate proposal with local codes; note that this can typically be included within total fixture counts if it is a self-contained single-user restroom:
 - a. A sign or label with text and symbols to indicate that the room is a bathroom, and it is inclusive of all genders
 - b. Provide within: toilet paper, waste receptacle, sanitary product dispenser
 - c. Provide within or directly adjacent: hand wash sink, mirror, soap dispenser, paper towel dispenser, waste receptacle
 - d. Meet all ADA accessibility codes without exclusions or exceptions
 - e. Meet occupant demand in quantity and location based on size of project (conveniently available to all occupants)

Encouraged on all projects:

1. Establish shared parking agreements with adjacent properties, public or private.
2. Provide dedicated bike lane connections.
3. Cooperate with local bike share programs.
4. Provide 25% reduction of on-site required parking space compared to local zoning requirements.
5. Use the [Federal Electric Vehicle Infrastructure Projection Tool](#) (EVI-Pro) Lite to determine the quantity of electric vehicle charging stations that the project will provide.
6. Provide site lighting for safety. Limit dead ends and/or visually isolated spaces that may pose security concerns and employ measures of crime prevention through environmental design (CPTED).

7. Provide opportunities to engage with the environment including landscape plantings, site furniture, seat walls, patios, building articulation, and public art.

For additional Best Practices, High Impact Approaches, Resources, and Project Case Studies for the **Designing for Equitable Communities** measure, please view the additional relevant information at the following link: <https://www.aia.org/showcases/6082410-designing-for-equitable-communities>

Measure 3: Designing for Ecology

Good design mutually benefits human and nonhuman inhabitants.

For all NC/MR/SC projects:

1. Dark Sky Compliance: Outdoor lighting system design shall utilize full cutoff type luminaires which minimize the amount of source lumens emitted above the horizontal plane of the luminaire and which minimize light spill onto adjacent facilities. When specifying exterior luminaires, include the required distribution type of the luminaire and/or a foot candle footprint description. Note: consultant should refer to the International Dark-Sky Association webpage at <https://www.darksky.org/> and DFD Division 26: Electrical Specifications for outdoor luminaire recommendations and outdoor lighting design recommendations.
2. Tree Survey Data:
 - a. For every development that requires a site survey, include tree data encompassing location, species, and condition of all trees of 2 inches or greater caliper within the project boundary. For projects involving forested areas or dense stands of trees, the A/E shall indicate the boundary of the area of work / disturbed area within the site and this shall define the limits of tree surveying. Any trees within 2-times the canopy width-distance of site disturbance should be documented by the survey.
 - b. A list of trees proposed for removal by the project, including indication of mature trees, shall be provided.
3. Bird Collision Deterrence
 - a. For facades with greater than 20% glazing:
 - i. 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.
 - ii. At green roof level glazing: apply deterrent design strategies to glazing surrounding and adjacent to green roof surface.
 - iii. The School of Veterinary Medicine addition on UW Madison campus provides an example of this strategy.
 - b. Reference [Bird Friendly Design Guide](#) for potential strategies and detailed information.
4. Reduce Urban Heat Island effect
 - a. Do at least one of the following in parking areas (or a combination thereof):
 - i. Provide tree islands: 1 per 15 stalls minimum.
 - ii. Provide shade from architectural structures for 50% of the spaces that either:
 1. Are covered with solar panels that produce energy.
 2. Have a vegetated roof.
 3. Have a Solar Reflectance Index (SRI) of at least 29.
5. Native Vegetation
 - a. Projects involving sitework must provide a minimum of 20% native vegetation.
 - b. Provide planting palette data identifying which species support pollinators or provide habitat.

6. These Guidelines are in addition to the Wisconsin Environmental Policy Act (WEPA) Section 3.D – Special Planning Issues in the PPM for applicable projects.

Encouraged on all projects:

1. Vegetation
 - a. Provide a planting palette that does not require irrigation.
 - b. Protect and conserve existing habitat and native vegetation.
 - c. Restore habitat with new native plantings.
2. Reduce Urban Heat Island effect by providing a green roof.
 - a. Green roofs should be designed to encourage biodiversity.
 - b. For extensive and semi-intensive roofs, consider providing native grasses and/or forbs within the planting scheme to support pollinators, provide habitat, and add visual interest.
 - c. For all vegetated roofs, follow DFD Division 07: Thermal and Moisture Protection Specifications.

For additional Best Practices, High Impact Approaches, Resources, and Project Case Studies for the **Designing for Ecology** measure, please view the additional relevant information at the following link: <https://www.aia.org/showcases/6082454-designing-for-ecology>

3. Reduce urban heat island effect. When possible, 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

Measure 4: Designing for Water

Good design conserves and improves the quality of water as a precious resource. For all measures, the project shall follow federal, state, and local zoning ordinances if more stringent. However, review or approval by local jurisdictions will be dictated individually, by the project agency or campus standards.

For all Tier 2 NC/MR/SC projects:

1. Define the project boundary based on the site property lines. If the project is part of a large, multi-site campus and property lines do not exist local to the project, determine the project boundary based on limits of disturbance.
2. Oil and Grease Control: Oil & Grease Control – treat the first ½ inch of runoff from parking lots (greater than 40 stalls), drive-throughs, and vehicle storage or maintenance areas with a capture device, or abide by the local ordinances, whichever is more stringent.
3. Reduce Total Suspended Solids (TSS)
 - a. Best Management Practices (BMPs) should reduce the total annual suspended solids by 80% for all new development, regardless of size, as compared with pre-development (pre-construction) loading. ‘Pre-development’ is defined as the conditions of the site prior to historical land-development activity or disturbance.
 - b. In a multi-site or campus environment, at least 40% of the required TSS reduction must be met on-site and off-site mitigation may account for the remaining 40% reduction if within the same watershed as the project.
 - c. Or abide by the local ordinances, whichever is more stringent.
4. Safe Overflow
 - a. 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.
 - b. 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.)
 - c. The project should document the drainage patterns and overland flow routes.
5. Indoor 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 Tier 2 Buildings with high-process usage (such as pools, on site chillers, or commercial kitchens): document best practices, model water usage, and exceed 10% savings.

Encouraged on all projects:

1. 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 then:
 - i. Reduce the 10-year storm event peak discharge rate by 15% compared to existing conditions
 - ii. Reduce the 10-year storm event site runoff volume by 5% compared to existing conditions
 - iii. Reductions shall be completed using green infrastructure that captures at least the first ½ inch of rain over the total site impervious area. Additional green or non-green best management practices (BMPs) may be used for volumes beyond the first ½ inch of rainfall if needed to comply with other requirements of this ordinance.
 - iv. Or abide by the local ordinances, whichever is more stringent.
- 2. Infiltration and Stormwater Volume Control
 - a. For new development, maintain 60-90% of pre-development infiltration volume depending on site imperviousness.
 - b. Or abide by the local ordinances, whichever is more stringent.
- 3. Restrict 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. See DFD Division 07: Thermal and Moisture Protection Specifications for providing water on vegetated roofs.
 - d. Refer to Measure 3: Designing for Ecology, Native Vegetation.

For additional Best Practices, High Impact Approaches, Resources, and Project Case Studies for the **Designing for Water** measure, please view the additional relevant information at the following link: <https://www.aia.org/showcases/6082471-designing-for-water>

- 4. Minimize non-porous paving and other impervious surfaces to protect site greenfield 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.

Measure 5: Designing for Economy

Good design supports human, community, and environmental health, regardless of project size and budget. Design choices must add value for owners, occupants, community, and planet.

For all Tier 2 NC/MR projects

1. Register and participate in the appropriate Focus on Energy program (or applicable utility ratepayer incentive program)
2. For projects where an energy model is required, estimate annual energy savings and greenhouse gas (GHG) emissions reduction from design over the baseline case (ASHRAE 90.1-2022) and include results.
3. 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.

For additional Best Practices, High Impact Approaches, Resources, and Project Case Studies for the **Designing for Economy** measure, please view the additional relevant information at the following link: <https://www.aia.org/showcases/6082495-designing-for-economy>

Measure 6: Designing for Energy

To promote the design and operation of energy-efficient buildings to reduce expenditures on imported fuel, reduce the impacts associated with greenhouse gas emissions, minimize negative impacts of refrigerant selection, and ensure readiness for next-generation energy infrastructure.

Mandatory

1. Unless otherwise noted:
 - a. All projects must meet or exceed the requirements of ANSI/ASHRAE/IESNA Standard 90.1–2022 .
2. ASHRAE 90.1 Compliance pathways in Section 4.2.1.1 include compliance with all mandatory provisions, and compliance with one of the following:
 - a. Prescriptive provisions of Sections 5 through 10
 - b. Section 12 Energy Cost Budget Method
 - c. Normative Appendix G Performance Rating Method. When using Appendix G, the Performance Cost Index (PCI) shall be less than or equal to the Performance Cost Index Target (PCIt) in accordance with the methodology provided in Section 4.2.1.1. Document the PCI, PCIt, and percentage improvement using metrics of cost or greenhouse gas (GHG) emissions
 - d. Exceptions
 - i. Receptacle outlets are not required to be switched
 - ii. Lighting controls are to be designed in accordance with the DFD Electrical System Standards and Design Guidelines
 - iii. For any conflicts with the DFD design standards the A/E is to request clarification and direction from the DFD PM

3. For all projects the Window to Wall Ratio (WWR) shall not exceed 30% for the east, west and south exposures. WWR on the north exposure shall not exceed 40%. These WWRs identified with building elevations assume a rectilinear building form, oriented within $20^{\circ}\pm$ of true north. If the building is oriented more than $20^{\circ}\pm$ off the north-south axis, then the 30% minimum applies to all elevations (SE, SW, NE, NW). For buildings with greater than average (12 feet to 13 feet) floor-to-floor height, the WWR should be proportionately decreased. **A/E team shall provide a deliverable to DFD that explicitly demonstrates WWR for proposed building and how this complies with requirement above. This deliverable is expected to include, but not be limited to, exterior building wall sections that show floor to floor height, window location, fin tube if used, and finished ceiling.**
4. Energy modeling shall be performed on all Tier 2 new construction projects and Tier 2 major renovation projects that have new complete mechanical systems. Confirm with DFD if unsure if modeling is required.
 - a. The design team shall use the energy modeling process to evaluate and revise the basic building concepts such as orientation, massing, envelope, materials, fenestration, shading, space programming, finishes and MEP systems and components to minimize heating, cooling, lighting and electrical requirements and energy consumption. The energy modeling process shall be used as an integral part of life cycle cost evaluations of different strategies.
 - b. The design shall not exceed the Energy Use Intensity (EUI) for the appropriate building category as displayed on the top of the following page:

SPACE TYPE*** (Includes all associated space such as circulation, IT rooms, mechanical/electrical rooms, toilet rooms, lobbies, stairs, etc.)	Maximum Allowable Site EUI (kBtu/ft²-yr)*	
	Climate Zone	
	5A	6A
Office/Conference Room-NC (new construction)	49	49
Office/Conference Room-MR (major renovation)	65	65
Classroom-NC	45	45
Classroom-MR	60	60
Laboratory	**	**
Classic Style Residence Hall with AC - NC	64	68
Classic Style Residence Hall with AC - MR	85	90
Suite Style Residence Hall with AC-NC	68	71
Suite Style Residence Hall with AC-MR	90	95
Laboratory	**	**
Corrections/DHS Wet Cells and Dayrooms - No AC	105	110
Corrections/DHS Wet Cells and Dayrooms - With AC	120	125
Corrections/DHS Dry Cells and Dayrooms - No AC	95	100
Corrections/DHS Dry Cells and Dayrooms - With AC	115	120
Corrections Health Services Unit	150	155

*For buildings that contain more than one type of space, calculate maximum allowable EUI based on the building space proportions. Maximum allowable EUI= ((Space Type A EUI x Space Type A square feet) + (Space Type B EUI x Space Type B square feet)) / (Total Building square feet). For buildings served by central

heating and/or cooling plants assume a COP of 4.2 for chilled water plant efficiency and 80% for heating plant efficiency.

** For lab buildings, use the [\(I2SL\) Laboratory Benchmarking Tool](#) to benchmark site EUI against measured data of peer facilities. .

***Confer with DFD for space types not included in the table. Also, confer with DFD if other project documentation and/or direction conflict with this table.

- c. Beginning with the Preliminary Design phase and extending through the Final Design document phase, calculate the following:
 - i. Predicted EUI and carbon equivalent (corrected for location based on the electric utility) for total building, demonstrating compliance with the project's EUI requirement.
 - ii. Predicted values of Lighting Power Density (LPD), Window-to-Wall Ratio (WWR), and anticipated plug loads
 - iii. Comparable minimum EUI and carbon equivalent shall meet ASHRAE 90.1
5. Chlorofluorocarbon (CFC)-based refrigerants are not to be used for new heating, ventilating, air-conditioning, and refrigeration (HVAC&R) systems.
6. 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.
7. The CxA 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.
8. All Tier 2 NC projects shall provide a minimum requirement of 1% of annual energy consumption from on-site renewable energy sources. For Tier 1 NC, Tier 1 MR and Tier 2 MR the design team shall assess the feasibility of providing 1% of on-site renewable energy resources during Preliminary Design phase.
 - a. Eligible on-site renewable energy sources may include:
 - i. Photovoltaic (PV) solar panels
 - ii. Transpired solar collectors for heating air
 - iii. Solar thermal systems for heating water
9. For all Tier 2 NC projects, in addition to providing an on-site renewable energy system to generate a minimum of 1% of annual energy consumption, ensure the project design is solar-ready to make maximum use of roof area (in cases where the initial system occupies only a partial roof area). Provide the following solar-ready requirements in the building design, and include the documentation as noted below:
 - a. Space on the roof has unrestricted solar access to the south, is free of obstructions such as rooftop equipment, utility poles, plumbing vents, or other shading elements, and is structurally designed with attachment points, if necessary, to accommodate the weight, wind, and additional snow loads imposed by the system.

- b. Roof material with sufficient durability and lifespan to withstand future solar installation and maintenance activities. Ensure the warranty of the selected roof system will not be voided by future installation of a typical solar system.
 - c. Clearly indicate any internal chase (or chases) with rated conduit and/or other means for connecting solar panels on the roof to the components and controls located within the building.
 - d. Show as part of the solar-ready documentation any space within the building that is conveniently located, readily accessible, and reserved for the installation of controls and components such as electric inverters, meters, disconnects, and hot-water storage tanks.
 - e. Provide a solar-ready Roof Plan, documenting location and extent of area dedicated for panels, chase location(s), electrical interconnection availability, roof structural capacity, and pertinent roofing product or system information.
 - f. Provide sufficient space in the main electrical panel(s) to allow for future connection to solar PV inverters and to accommodate any net-metering requirements of local utility.
10. 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 PM in consultation with the UWs.
11. The design team is to review the feasibility of providing an on-site battery storage system as a means of reducing electrical demand for the building, either with or without a solar PV system. On-site battery storage systems may also be used in place of fossil-fuel emergency generators provided they are approved by DFD technical staff and by the authority having jurisdiction (AHJ). Provide the results of the analysis of on-site battery storage for the project.
12. All Tier 2 NC/ MR projects to use Level 2 Commissioning for building systems and/or envelope. Systems to be commissioned shall be discussed with DFD Technical services prior to Cx selection. Agencies shall reference the Capital Budget instructions when budgeting for these services.

For additional Best Practices, High Impact Approaches, Resources, and Project Case Studies for the **Designing for Energy** measure, please view the additional relevant information at the following link: <https://www.aia.org/showcases/6076709-designing-for-energy>

Measure 7: Designing for Wellness

Good design supports health and wellbeing for all people, considering physical, mental and emotional effects on building occupants and the surrounding community.

Mandatory for all projects

1. Smoke-Free Environment: All State-owned and operated facilities shall be designated smoke free and e-cigarette (vape) free.
 - a. Smoking and the use of e-cigarettes is prohibited in interior spaces within the project boundary.
 - b. Smoking is prohibited within 25 feet (or the maximum extent allowable by local codes) of all entrances, operable windows and building air intakes.
 - c. Smoking is prohibited on all decks, patios, balconies, rooftops, and outdoor galleries. Signage is present to clearly communicate the ban.
 - d. Signage should be present to clearly communicate the bans but also be intentionally incorporated into the site or architectural design.
 - e. These are minimum requirements, and if agency guidelines differ, the more stringent requirements shall apply to the project.

Project specific requirements, address all items listed above, including the following:

1. [Biophilia](#): For all NC/MR projects, project stakeholders (including at a minimum DFD PM, Agency Contact, and a minimum of one representative each from the A/E and MEP disciplines) shall hold a meeting in Preliminary Design phase dedicated to integrating biophilic design into the project. The meeting shall include project goals and objectives. See the “The [Economics of Biophilia](#)” report for additional information, benefit, and strategies.
2. Daylighting:
 - a. All projects shall comply with the prescriptive provisions of Section 5 from ASHRAE 90.1-2022, the window wall ratios indicated in section 6 of this guideline and DFD Master Specifications
 - b. Access to Daylight: for all Tier 2 NC/MR projects, occupied spaces shall meet the following minimum criteria to ensure equitable access to daylight. Daylighting metrics may be verified through daylight model or post occupancy verification.
 - i. In all spaces, achieve at least one of the following requirements:
 1. Spatial Daylight Autonomy of $sDA_{200,40\%}$ is achieved for at least 30% of regularly occupied space.
 2. Locate workspaces such that at least 30% of all workstations are within 20 feet of transparent envelope glazing.
 3. Transparent envelope glazing is no less than 7% of the floor area for each floor level.
 - ii. In common spaces: Locate common spaces such that at least 70% of all seating is within 16 feet of transparent glazing with views to the exterior.
 - iii. Prioritize the location of areas of highest use, such as common or shared areas and open workspaces, at available exterior glazing.
 1. If private offices are located along an exterior wall that provides daylight and views, a minimum of 50% of the interior face must be transparent or translucent if facing a common area (other than

circulation) to allow borrowed light. Transom height glazing is also encouraged.

3. Construction measures to protect future indoor air quality: Implement and document measures to protect materials and equipment from moisture and contaminants, according to DFD Specifications and industry best practices.

Encouraged on all projects:

1. Acoustic Comfort: Spaces in the following categories should meet minimum wall and ceiling noise reduction coefficient criteria to ensure acoustic comfort appropriate to use: open workspaces, enclosed offices, dining spaces, conference rooms, and classrooms.

Ceiling Finishes

Open workspaces, enclosed offices, dining spaces	NRC 0.7 for at least 75% of available ceiling area
Conference rooms, classrooms	NRC 0.7 for at least 50% of available ceiling area

Wall Finishes

Enclosed offices, dining spaces	NRC 0.7 for at least 25% of one wall
Conference rooms, classrooms	NRC 0.7 for at least 25% of two walls

For additional Best Practices, High Impact Approaches, Resources, and Project Case Studies for the **Designing for Wellness** measure, please view the additional relevant information at the following link: <https://www.aia.org/showcases/6082617-designing-for-wellness>

2. Use materials on the building interior that meet low-emitting criteria.
 - a. Specify Paints and Coatings, and Adhesives and Sealants that meet VOC content limits identified in LEED.
 - b. Flooring. 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.
3. Review emissions evaluations and certifications when selecting furniture and choose low emission options when available. To identify low VOC, look for product 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 Section 7.6.1, 7.6.2, OR 7.6.2 AND 7.6.3.

Contractor to implement measures to protect materials and equipment from moisture and contaminants according to DFD Specifications and industry best practices.

Measure 8: Designing for Resources

Good design depends on informed material selection, balancing priorities to achieve durable, safe, and healthy projects with an equitable, sustainable supply chain to minimize possible negative impacts on the planet.

For all projects

1. Exotic Hardwood Prohibition: Do not utilize exotic hardwoods, which are wood species typically found around the world – usually coming from the more tropical areas. Select sustainable and regional alternatives.
 - a. Exterior applications: If wood is utilized, specify alternatives to exotic hardwoods such as thermally modified lumber, polymerized wood, acetylated wood, black locust, Forest Stewardship Council (FSC) western red cedar, FSC Douglas fir, western juniper, or reclaimed lumber, among others.
2. For TI Projects: Use a minimum of 10 products with Environmental Product Declarations (EPDs).
3. Reduce and recycle construction and demolition waste.
 - a. The minimum target diversion rate is 75%, reference the DFD Master Specification Section 01 74 19 Construction Waste Management, dated 01/01/2022.

For all NC/MR projects, all items listed above, including the following

4. Perform a Life Cycle Assessment (LCA) that tracks embodied carbon. Identify tools used and summarize results.
5. Environmental Product Declarations (EPDs): Use a minimum of 20 products with EPDs.

Encouraged on all projects:

6. Responsible Steel Usage:
 - a. When possible on a project in compliance with the competitive bid process:
 - i. Source Responsible Steel certified structural steel
 - ii. Specify steel extracted and manufactured in the United States.
 - b. Material Mass:
 - i. Employ design strategies to reduce the mass of the steel required while achieving desired functionality.
7. Responsible Concrete Usage:
 - a. Sourcing:
 - i. Reduce the amount of Portland Cement utilized in the concrete mix while still achieving required strength. Specify concrete with a high supplementary cementitious material (SCM) content, such as fly ash, slag, pozzolan, and lime, among others.
 - ii. Employ carbon-sequestering aggregate or mix techniques
 - b. Material Mass:
 - i. Employ design strategies which reduce the overall mass of concrete in the project while achieving desired functionality.

8. Responsible Architectural Insulation Usage:
 - a. Specify building insulation with low embodied carbon, such as cellulose or mineral wool, in lieu of plastics-based insulation (does not apply to mechanical or plumbing insulation)
9. Responsible Wood Sourcing:
 - a. Interior applications: Specify species available to be harvested and milled locally within Wisconsin.
 - b. Specify FSC certified lumber in the following applicable divisions:
 - i. Division 06: Wood, Plastics and Composites
 - ii. Division 07: Thermal and Moisture Protection
 - iii. Division 08: Openings
 - iv. Division 09: Finishes
 - v. Division 12: Furnishings
 - vi. Division 32: Exterior Improvements
10. Local and Regional Priority
 - a. Utilize materials and products which can be procured via competitive bid process that are regionally available (extracted and manufactured) whenever possible, within the State of Wisconsin or a 500-mile radius of the project site.

For additional Best Practices, High Impact Approaches, Resources, and Project Case Studies for the **Designing for Resources** measure, please view the additional relevant information at the following link: <https://www.aia.org/showcases/6082636-designing-for-resources>

Measure 9: Designing for Change

Adaptability, resilience, and reuse are essential to good design, which seeks to enhance usability, functionality, and value over time.

For all NC/MR projects:

1. Reuse Reporting
 - a. Provide the percentage of project floor area (if any) that represents adapting or reuse of existing building.
 - b. If a project reuses existing building, provide percentage of carbon emissions saved through adaptive reuse versus new construction.
 - c. See Measure 8: Designing for Resources, carbon intensity for synergies
2. Risk Assessment
 - a. List the likely threats a project may face, both environmental / climate and health and safety. Describe how the design supports safety and recovery in these scenarios (such as designated safe zones or alternate modes of use to support recovery in emergency).
3. Resilience
 - a. Provide a paragraph describing if the project site is subject to persistent erosion or environmental risks. 'Persistent erosion' is defined as environmental conditions or forces continuing *after* site restoration or establishment.
 - b. Describe how the project avoids or protects the investment and adjacent site from erosion.

Encouraged on all projects:

1. Renewable-Ready
 - a. Provide necessary infrastructure and design considerations to support future installation of solar photovoltaic arrays if none are required in Measure 6: Designing for Energy.
2. Interchangeability
 - a. Provide a paragraph describing how the building will meet program needs on opening day and enable adaptability for future unknowns.

For additional Best Practices, High Impact Approaches, Resources, and Project Case Studies for the **Designing for Change** measure, please view the additional relevant information at the following link: <https://www.aia.org/showcases/6082660-designing-for-change-->

Measure 10: Designing for Discovery

Every project presents a unique opportunity to apply lessons learned from previous projects and to gather information to refine the design process.

Mandatory for NC/MR Tier 2 projects

1. CxA to track utilities 6, 12, and 18 months consistent with Measure 6: Designing for Energy criteria.
2. A meeting to discuss lessons learned on the project shall be conducted (at a minimum) between the DFD Project Manager, DFD Construction Representative and the A/E of Record. The meeting shall occur within 14 days of substantial completion and may include the MEP subconsultants. The meeting shall cover all phases of the project from design through construction, and its purpose is to gain feedback to enhance a continuous improvement process. Topics shall include but are not limited to:
 - a. DFD Specifications and Guidelines
 - b. Identification of effective strategies
 - c. Identification of areas needing extra effort

Encouraged on all projects:

1. Consider performing a preoccupancy evaluation to understand how an agency's current facility is performing.
2. 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.

For additional Best Practices, High Impact Approaches, Resources, and Project Case Studies for the **Designing for Discovery** measure, please view the additional relevant information at the following link: <https://www.aia.org/showcases/6082671-designing-for-discovery>

3. When applicable provide educational tours for occupants and visitors on sustainable features and their roles and responsibilities for maintaining building performance. Document and make available for self-guided tours.
4. When appropriate create a case study and share with the Agency contact, DFD Project Manager, Section Chief Project Delivery, and Section Chief Technical Services which shares the project's sustainability features and metrics.

END