

SUSTAINABLE Design GUIDELINES  
*for the*

Menomonee River Valley

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**Table of Contents**

**I. Site Design**

Site Analysis & Planning  
Stormwater Management  
Natural Landscape  
Parking & Transportation  
Site Lighting

**Appendix 1**

Menomonee Valley Sustainable Guidelines  
Evaluation Form

**II. Building Design & Energy Use**

Building Design  
Energy Efficiency  
Daylighting & Interior Lighting  
Alternative Energy  
Building Commissioning (Quality Control)

**III. Materials & Resources**

Exterior and Interior Materials  
Water Conservation

**IV. Construction/Demolition**

Waste & Recycling  
Erosion & Dust Control  
Pre-Occupancy Controls for Indoor Air  
Quality

**V. Indoor Environmental Quality**

Indoor Air Quality  
Acoustic Quality

**VI. Operations & Maintenance**

Operations Manual & Monitoring  
Facility Maintenance  
Maintenance and Stewardship of Site &  
Landscape Elements

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# I. Site Design

**Purpose:** *Promote adaptive reuse of Valley lands that recognizes the ecological context, river influence, existing landmarks, building stock and industrial heritage, and improve existing infrastructure (sidewalks, streets, storm drainage).*

Sustainable site design should address water quality, quantity and floodplain issues, native species, open space that provides recreation, wildlife habitat, cultural and neighborhood connections; and alternative transportation, lighting and parking design. Guidelines in bold are required.

## 1 Site Analysis & Planning

*Site planning guidelines are intended to maximize the build out area and create a cohesive image for the Menomonee Valley.*

- A. **Maintain a ratio of total gross floor area to the total lot area of no less than 33% for initial site build-out.**
- B. **Along the primary street, build to street-fronting property line. If not feasible the setback shall not be more than 10 feet.**
- C. **From the outset of the development project through construction, ensure that specifications, sequencing and site inspections are included so as to protect the function and quality of landscape materials, soils, and trees.**
- D. Utilize beneficial reuse practices with construction materials, including soils.
- E. Use locally sourced and/or recycled materials for building and site signage.
- F. **Install utility lines underground when feasible.**

## 2 Stormwater Management

*Cost effective natural systems use water efficiently and enhance water quality.*

- A. **Connect to the regional stormwater treatment area (i.e., bioretention facility) or coordinate with neighboring parcels to create a regional stormwater management system across property lines. If regional or shared is not feasible or available, stormwater shall be captured on-site, incorporating alternative forms of onsite stormwater management (e.g. bioswales, cisterns, green roofs, pervious pavement). Utilize setbacks for public access and waterways as a blue belt to encourage an urban development pattern).**
- B. Capture rainwater from roofs and downspouts and design outlets to be released to landscaped areas wherever possible. Integrate larger-scale rainwater capture for irrigation into the design of the building systems.
- C. Design landscape planting materials, soils and subsoils for infiltration and evapotranspiration of rainwater. Note that soils and subsoils placed above a remedial cover can serve to store and evapotranspire collected stormwater. Whenever landscaped areas will be designed and graded to receive stormwater runoff, provide a planting plan and soil specifications (i.e. mix, depth) that are consistent with WI DNR or comparable guidance for bioretention areas.

- D. All surface parking areas must be drained to a landscaped perimeter and/or islands properly designed with porous pavers or other stormwater management techniques and maintained to receive stormwater outflows unless being diverted to other onsite or nearsite stormwater management facility.

The design of landscaped areas receiving inflow from parking lots should follow Wisconsin DNR or equivalent guidance and must include appropriate features (i.e. energy dissipation at inlets, grading and planting plans, soil mixes and drainage) to function as stormwater management areas.

Other landscaped areas and open space on the site should be designed to maximize the environmental and water quality function through measures such as soil amendment, replacement of compacted soils or turfgrass with deep-rooted vegetation suited to the climate, and supplemental tree planting. Limit turfgrass to areas planned for recreation.

### **3 Natural Landscape**

*Well designed landscaping with native species reduces water consumption and long-term maintenance costs and improves building energy efficiency and aesthetics.*

- A. **Ensure that all disturbed or exposed soil areas are fully stabilized throughout construction and until all final plantings are stabilized. All landscaping shall be planted within the first appropriate planting season following construction completion.**

**If constructing a bioretention facility, stage the planting of bioretention and stormwater-related plantings with the life cycle of the specific plants in the planting plan.**

- B. **Surface parking lots shall have interior landscaping requirements in accordance with Sec. 295-405-2 of the City of Milwaukee Zoning Code.**
- C. **Select native plants and trees tolerant of climate including extended dry periods and heavy summer rains in order to reduce the total potable water demand for irrigation systems. Use captured rainwater as a first source for irrigation to minimize potable water use.**
- D. **Specify native plant and tree species in from the Menomonee Valley Species Palette for at least 80% of planted area, excluding expansion parcels. Expansion parcels should be planted with deep-rooted grasses or vegetation, or amend turfgrass areas to enhance soil quality and infiltration, rather than utilizing sod or leaving compacted turfgrass in place.**
- E. Prepare a site and landscape management plan that includes Integrated Pest Management practices to reduce the use of pesticides and herbicides. Include specification that any pesticides, herbicides and fertilizers used be suitable for organic gardening, unless specifically required for a particular use.
- F. **Remove all existing invasive species on-site and exclude all invasive species identified by the Invasive Plan Association of Wisconsin ([www.ipaw.org](http://www.ipaw.org)) from the landscape plan.**
- G. Where rooting area will be limited, use strategies such as connected planting beds, rooting breakouts under parking, or walkways floating on root-permeable soils to extend rooting space and increase plant vigor. Establish engineering specifications for these strategies, drainage patterns, and installation of structural soils as part of the building design and site grading plans.

## 4 Parking and Transportation

*Well designed parking areas efficiently use space, accommodate pedestrians and are aesthetically pleasing.*

- A. Encourage transportation alternatives for employees and visitors by providing:
  - Contiguous walkways linking parking areas, building entrance public sidewalks, bicycle parking, and to any existing transit facility.
  - Shower and changing facilities for bikers, walkers, and runners.
  - Provide electric vehicle charging stations.
- B. While parking is strongly encouraged to be located to the side and rear of the building, any parking located in front of the primary street facing façade should be limited to one double sided row and not within 10 feet of the front property line. Provide visual screening using a combination of fencing or landscaping which may be designed to accept and manage storm inflow.
- C. Minimize curb cuts and driveways, preferably no more than two. Driveway widths should be the minimum necessary for safe access and egress by types of vehicles anticipated for the property.
- D. Locate truck loading berths at the side or rear of the building and post 'no idling' signs within sight of drivers. Locate any location where vehicles may idle away from fresh air intakes.
- E. Use on-street parking and shared parking in all parking calculations to minimize the area of surface parking on site. Minimize parking stall dimensions to 9'x18' as smaller stalls will decrease the parking lot size and allow for a large building footprint, except as required for delivery or specialty vehicles and ADA-compliant spaces.
- F. Use steam infrastructure to heat parking lots and sidewalks to reduce or eliminate use of winter salting.
- G. Establish a BublR Bike station independently or with surrounding businesses. If this is not feasible at time of construction, ready the site for any future bike sharing system with pre-laid electrical conduit and outlets leading to a new or existing power source.

## 5 Site Lighting

*Effective and efficient site lighting improves aesthetics, reduces energy use and maintenance, and preserves the night sky.*

- A. Use high efficiency LED lighting or plasma lighting.
- B. Provide site lighting appropriate for the security needs of the site while maintaining an overall "low-lighting profile" for the complex.
- C. Use low cut off angles and down lighting for landscaping or energy conserving motion sensed lights for all lighting. Special attention for lighting placement and coverage should be given to security lighting, loading docks, and entry
- D. Where appropriate, install pedestrian safety lighting along walks.
- E. Incorporate best management practices to honor goals of achieving Dark Sky Standards.

## II. Building Design and Energy Use

**Purpose:** *Generate operating cost savings by designing for energy efficiency and ensuring that the building is capable of operating in accordance with its design.*

Building design should address energy efficiency, daylighting techniques, building commissioning, improved systems controllability and improved aesthetics. Guidelines in bold are required.

### 1 Building Design

*Thoughtful building design creates a uniform and inviting sense of place for employees and customers.*

- A. **At pedestrian areas of the building, use awnings, canopies, landscaping, windows and doors to lower the scale of the building.**
- B. **Design a principal façade and obvious main entrance parallel to the street edge. Do not face blank walls towards public streets.**
- C. Where possible, orient buildings along an east-west axis for maximum daylighting benefits.
- D. **Public facades shall utilize brick (reclaimed or new), architectural pre-cast concrete panels, architectural finished metal cladding, decorative concrete block or cut stone. Sheet metal, vinyl siding, E.I.F.S., reflective glass and imitation stone siding are discouraged.**
- E. **Maximize glazing as a component of office and entry area design. Use regular spaced or continuous glazing elements such as clerestory windows and vertical bands on all other exterior walls to break up long stretches of blank walls.**
- F. **Screen sources of mechanical noise, odors and loading operations from public open space areas and adjacent properties.**
- G. Locate utility meters and exhaust vents on the side or rear of building.
- H. **Screen or locate roof-top mechanical equipment so it is not visible from the street and trails.**
- I. Design to accommodate areas for recycling of waste materials. Provide a centralized ground-floor location for collection and storage of recyclables and composting and screen exterior collection areas.
- J. Locate fresh air intake locations away from loading docks, HVAC exhaust, and any location where vehicles may idle.

## 2 Energy Efficiency

*Simple energy-saving techniques and technologies generate significant operating cost savings.*

- A. Meet current ASHRAE 90.1 for energy efficiency. Strategies may include the following:
  - Group spaces for similar functions or requirements to concentrate similar heating and cooling demands, and use non-program spaces as climate buffers.
  - Use thermal mass such as masonry or concrete to moderate interior temperatures and to achieve desired R-value in foundation, walls and roof.
  - Design air-lock entrances to reduce heat loss or gain.
  - Use Energy Star Roof-compliant, high reflectance and high emissivity roofing to reduce heat retention in summer, unless using a green roof.
- B. Specify Energy Star equipment and appliances and purchase EPEAT-registered electronics ([www.epeat.net](http://www.epeat.net))
- C. Install separate circuitry to isolate HVAC, lighting and plug loads, enabling operations and maintenance staff to monitor energy use on site.
  - If plug loads are grouped, the metering process for monitoring becomes easier to accomplish. Guides such as GIL 65 and the CIBSE TM39 2009: Building Energy Metering can assist.
  - Monitor energy by sub-metering (See D below) and the BMS can run energy calculations when programmed to do so.
- D. Install meters for sub-metering.

## 3 Daylighting and Interior Lighting

*Daylighting and efficient interior lighting reduce energy use and create a pleasant, productive work environment.*

- A. A minimum of 75% of occupied interior spaces to be day lit through the following strategies:
  - Maximize window height and use roof monitors, clerestory windows, skylights, and light-pipe technology to transmit light to spaces not reachable by other means.
  - Balance glazing color for view, daylight and energy performance. Choose clear, transparent glass to allow for double panes and energy efficiency.
  - Use interior windows, light shelves and low partitions to bring daylight deeper into the space, manage glare, and balance light levels.
  - Use south-facing windows with appropriate overhangs to reduce summer sun and admit winter sun.
- B. Perform a photometric analysis of the floor plate for lighting and daylighting.
- C. Supplement daylighting with highly efficient electric light distribution that improves visual quality while reducing electricity use. Including:
  - Rely on low ambient lighting levels for general illumination (predominately light reflected from the ceiling where achievable) boosted by high quality, flexible task lighting. For general office space and non-critical manufacturing task areas consider achieving a lighting power density (LPD) goal of between 0.5 and 0.7 watts / ft<sup>2</sup>.

- Use high efficiency lamps and luminaires or LED's with electronic ballasts.
- Employ efficiency-based controls such as dimmers, occupancy sensors, and lumen maintenance controls that can be programmed for day lighting.
- Wire luminaires parallel to walls with windows so they can be dimmed or turned off by row.

## **4 Alternative Energy**

*Alternative conventional and renewable energy sources reduce your energy costs and your impact on natural resources.*

- A. Purchase power generated from renewable sources (solar, wind, biomass, steam, or low impact hydro sources) through renewable energy credits (REC's).
- B. New construction should be built ready for onsite renewable energy generation such as small wind, solar, hot water, solar electric, or ground source heating cooling. Where feasible use a closed loop ground source (geothermal) heating and cooling system.
- C. Install onsite renewable energy generation for a minimum of 5% energy demand.

## **5 Building Commissioning (Quality Control)**

*Building Commissioning is a systematic and documented process of ensuring that the owner's operational needs are met, building systems perform efficiently, and building operators are properly trained. Commissioning can be applied in new construction, past construction and existing buildings.*

- A. Contract with an independent commissioning authority from the beginning of the design process to review design options and expected operation of building and its component systems. Have the building engineer train staff to operate and maintain the building.
- B. Use long-term continuous measurement of performance for building and site systems.

### III. Materials and Resources

**Purpose:** *Reduce impact on natural resources as well as reduce costs, increase performance and improve aesthetics and the working environment.*

Selection of building materials and resources should involve consideration of available and renewable natural resources in addition to more traditional criteria such as cost, durability, performance, and aesthetics. Guidelines in bold are required.

#### 1 Exterior and Interior Materials

***Using building materials with low life cycle costs, high-recycled content and low toxicity reduces environmental impacts.***

- A. Achieve the following building goals:
  - Use 35% materials with post-consumer or pre-consumed recycled content.
  - Use 20% materials and products that are manufactured within a 500-mile radius.
  - Specify US Forest Stewardship Council-certified wood-based materials and products or urban wood for 25% of all wood used in the project.
- B. Specify mold- and moisture-inhibiting construction materials.
- C. Within the air barrier, use paints, coatings, sealings, and adhesives that are certified by Green Seal as low or no-VOC and chemical component limits.
- D. Use carpet systems that meet the requirements of the Carpet and Rug Institute's Green Label Indoor Air Quality Test Program.
- E. Use composite wood and agrifiber products that do not contain added urea-formaldehyde resins.
- F. Specify building materials (e.g. insulation, carpet pad) that do not use CFC's or HCFC's as foaming agents or in other parts of the manufacturing process.
- G. Use CFC-free HVAC&R equipment.

#### 2 Water Conservation

***Off-the-shelf technologies can significantly reduce water consumption and associated costs.***

- A. Employ whole-building design strategies and use the following high-efficiency plumbing fixtures to reduce aggregate water use:
  - Specify lavatory faucet aerators and low-flow electronic sensor faucets or EPA WaterSense-certified fixtures and fixture fittings in lavatories or provide lavatories with pedal controls.
  - Install ultra low-flow, low-flow, or dual plumbing fixtures.
- B. Install a cooling tower.
- C. Fully implement the Alliance for Water Stewardship Standard.
- D. Ensure any leaking or lead laterals are replaced to ensure healthy and safe drinking water for building occupants.

## IV. Construction & Demolition

**Purpose:** *Improve construction and demolition waste management practices to reduce waste, costs and environmental impacts of demolition and construction activities and transform wastes into resources.*

Guidelines in bold are required.

### 1 Waste and Recycling

*Reduce, Reuse and Recycle construction and demolition waste to protect on-site materials and reduce environmental impacts.*

- A. **Implement a Construction or Demolition (if applicable) Waste Management Plan to recycle and/or salvage at least 75% of construction, demolition and land clearing waste. Include waste reuse and recycling in project specifications. Calculations can be done by weight or volume, but must be consistent throughout. This plan should cover and take into account:**
- An approved neutral third party organization, such as WasteCap Resource Solutions, should be used as a plan manager. If a person is certified by WasteCap through the C&D training course, this person can be used.
  - Identification of opportunities to reduce site disturbance and minimize environmental impact of construction activities. Work with an approved neutral third party organization, such as WasteCap Resource Solutions. [www.wastecap.org](http://www.wastecap.org)
  - A list of materials to be separated for recovery and designation of areas for collection.
  - A plan to educate workers about separation requirements and have on hand instructions for sorting/separating materials.
  - Procedures for waste auditing.
  - On-site soils management, including areas of concern, types of contamination and disposal or encapsulation methods.
  - List sorting/separation/tracking rules.
- B. Salvage 80% of existing building materials for reuse or resale.
- C. Salvage 90% of construction, demolition and land clearing waste.

### 2 Erosion and Dust Control

*Appropriate control measures protect air and water quality.*

- A. **Follow Wisconsin Administrative Code NR 216 and City of Milwaukee Chapter 290 to control erosion regardless of the size of land disturbance.**
- B. **Create an erosion control plan that conforms to the best management practices (BMP's) in the EPA's Storm Water Management for Construction Activities (or local regulations if they meet or exceed the EPA Standards).**

### **3 Pre-Occupancy Controls for Indoor Air Quality**

*Protection of mechanical equipment and building materials during construction will ensure healthy indoor air quality after occupancy.*

- A. Protect stored on-site or installed absorptive materials from moisture damage and mold, and replace all filtration media immediately prior to occupancy.
- B. Install wet materials before dry in construction sequence to reduce indoor air pollutants.

## V. Indoor Environmental Quality

**Purpose:** *Provide a healthy and productive environment for facility occupants; increase the comfort and alertness of occupants; improve productivity and reduce absenteeism.*

Good indoor environmental quality encompasses such factors as temperature and relative humidity, adequate ventilation, visual comfort, and noise control. Guidelines in bold are required.

### 1 Indoor Air Quality

*Indoor air quality affects occupants' health, which can impact absenteeism rates and employee productivity.*

- A. **Demonstrate ventilation compliance at a worst-case condition (i.e. supply fan at minimum speed and outdoor air damper at minimum position).**
- B. **Provide direct exhaust for all spaces that generate moisture and pollutants, including manufacturing, toilet and locker rooms, copy rooms and rooms where chemicals and cleaners are stored.**
- C. **Prohibit smoking within 25 feet of entrances and post signs stating this. Provide a designated smoking area and receptacles for cigarette waste.**
- D. Prepare an indoor air quality plan.
- E. Replace all filtration media immediately prior to occupancy using filtration media that have a Minimum Efficiency Reporting Value (MERV) of 13, as determined by most current ASHRAE standards.
- F. Increase ventilation to exceed air change effectiveness of 0.9 per most current ASHRAE standards.
- G. Provide for the use of natural ventilation in transition seasons. Take advantage of cross ventilation, prevailing winds and stack effects when possible.
- H. Provide mats or grills at entry areas to control dirt and dust.
- I. Utilize a carbon dioxide monitoring system in spaces of variable occupancy to provide feedback on space ventilation performance. Specify initial operational set point parameters to ensure indoor carbon dioxide levels do not exceed outdoor levels by more than 530 ppm at any time.
- J. Conduct a two-week flush of systems at 100% outside air before occupancy.
- K. Use Ultra Violet (UV) light sources to keep heat exchangers and "A" coils clean and running at peak efficiency.

### 2 Acoustic Quality

*Improved acoustic quality ensures high employee productivity, attention span and minimizes stress.*

- A. Maintain a maximum interior Noise Criteria of 35 decibels in occupied areas. Ceiling panels and carpeting can assist in absorbing sound.

- B. Place acoustic buffers (corridors, lobbies, stairwells, storage rooms, etc.) and sound-insulated partitions between noise-producing spaces and noise-sensitive areas.
- C. Place vibrating equipment on isolation pads and enclose in sound-absorbing walls, floors and ceilings.
- D. Maintain a maximum external decibel reading of 50db at the property line.
- E. In areas of high ambient noise, specify windows rated at an STC of 40 or better.
- F. In other areas, specify windows rated at 35 or better.

## **VI. Operations and Maintenance**

**Purpose:** *Ensure the building operates at its designed efficiency, reducing costs and increasing occupant productivity over the full life of the facility. Guidelines in bold are required.*

### **1 Operations Manual and Monitoring**

***A building that is operated in accordance with its design and construction will maintain its value and continue its high performance.***

- A. Prepare a Building Operating Plan, Systems Narrative, Sequence of Operations, and a Preventive Maintenance Plan. Creation of a Systems Manual is optional. (For additional guidance see LEED v4 Fundamental Commissioning for sections of Systems Manual)
- B. Schedule regular systems review and maintenance.
- C. Prepare an operational waste prevention and recycling plan.

### **2 Facility Maintenance**

***Proper housekeeping and operations activities can protect the health and comfort of occupants and decrease the impact of the building on the environment.***

- A. Maintain healthy and efficient custodial operations using Green Seal or equivalent cleaning products.
- B. Frequently inspect for fungus and molds.
- C. Form an in-house "Green Team" to raise awareness of workplace associated environmental concerns.
- D. Provide dedicated areas for the collection and storage of recyclable materials for the entire building.
- E. Do not store materials, products or equipment outdoors, except finished product in transit and company-owned vehicles.

### **3 Maintenance and Stewardship of Site and Landscape Elements**

***Proper long term maintenance of landscape elements will maintain their aesthetic beauty and financial value.***

- A. Prepare and implement a landscape care and maintenance manual or plan to ensure long-term viability of plantings. This should identify any long-term sequencing actions that are intended by the landscape designer.