

SUSTAINABLE Design GUIDELINES
for the

Menomonee River Valley

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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) 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)
- 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 / ft².

- 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
 - 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.

Appendix 1: Menomonee Valley Sustainable Design Guidelines Evaluation Form

I. SITE DESIGN		Maximum Value	Project Value
1 Site Analysis & Planning			
<input type="checkbox"/> A.	Maintain a ratio of total gross floor area to total lot area of no less than 33% for initial site build-out.	Required	
<input type="checkbox"/> B.	Along the primary street, build up to the street fronting property line. If not feasible, the setback shall not be more than 10'.	Required	
<input type="checkbox"/> 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 landscaped material, soils, and trees.	Required	
<input type="checkbox"/> D.	Utilize beneficial reuse practices with construction materials, including soils.	1	
<input type="checkbox"/> E.	Use locally sourced and/or recycled materials for building and site signage.	1	
<input type="checkbox"/> F.	Install utility lines underground when feasible.	Required	
2 Stormwater Management			
<input type="checkbox"/> 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. Incorporate alternative forms of onsite stormwater management (ex: bioswales, cisterns, green roofs, pervious pavement). Utilize setbacks for public access and waterways as a blue belt to encourage an urban development pattern.	Required	
<input type="checkbox"/> 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 building systems.	1	
<input type="checkbox"/> C.	Design landscape planting materials, soils and sub-soils for infiltration and evapotranspiration of rainwater. Note that soils and subsoils placed above a remedial cover can serve to store and evapotranspire collected stormwater. Wherever 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.	1	
<input type="checkbox"/> D.	<p>All surface parking areas must be drained to a landscaped perimeter and/or islands with properly designed, porous pavers, or other stormwater management techniques, and maintained to receive stormwater outflows, unless being diverted to other onsite or nearsite stormwater management facility.</p> <p>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, planting plans, soil mixes and drainage) to function as stormwater management areas.</p> <p>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.</p>	1	

Appendix 1: Menomonee Valley Sustainable Design Guidelines Evaluation Form

3 Natural Landscape

<input type="checkbox"/> 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.	Required	
<input type="checkbox"/> B. Surface parking lots shall have interior landscaping requirements in accordance with Sec. 295-405-2 of the City of Milwaukee Zoning Code.	Required	
<input type="checkbox"/> C. Select native plants and trees tolerant of climate including extended dry periods and heavy rains in summer, 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.	Required	
<input type="checkbox"/> D. Specify native plant and tree species 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.	Required	
<input type="checkbox"/> 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.	1	
<input type="checkbox"/> F. Remove all existing invasive species on site and exclude all invasive species identified by the Invasive Plan Association of Wisconsin (www.ipaw.org) from the landscape plan.	Required	
<input type="checkbox"/> 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.	1	

Appendix 1: Menomonee Valley Sustainable Design Guidelines Evaluation Form

4 Parking and Transportation

<input type="checkbox"/> A. Encourage transportation alternatives for employees and visitors by providing: <ul style="list-style-type: none"> ● Contiguous walkways linking parking areas, building entrance, public sidewalks, bicycle racks, and any existing transit facility. ● Shower and changing facilities for bikers, walkers and runners. ● Provide electric vehicle charging stations. 		
	Required	
	1	
	1	
<input type="checkbox"/> B. While parking is strongly encouraged to be located on the side or rear of the building, any parking located in front of the primary street facing facade shall be limited to one double-sided row and shall not be within 10 feet of the front property line. Provide visual screening of parking areas using a combination of fencing or landscaping, which may be designed to accept and manage stormwater inflow.	Required	
<input type="checkbox"/> C. Minimize curb cuts and driveways, preferably no more than two. Driveway widths should be the minimum necessary for safe access by the types of vehicles anticipated for the property.	Required	
<input type="checkbox"/> D. Locate truck loading berths at the side or rear of the building and post "no idling" sign within sight of drivers. Locate any location where vehicles may stand idling away from fresh air intakes.		
<input type="checkbox"/> 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' x 18', 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.	Required	
<input type="checkbox"/> F. Use steam infrastructure to heat parking lots and sidewalks to reduce or eliminate use of winter salting.	1	
<input type="checkbox"/> 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.	1	

Appendix 1: Menomonee Valley Sustainable Design Guidelines Evaluation Form

5 Site Lighting

<input type="checkbox"/> A. Use high efficiency LED lighting or plasma lighting.	Required	
<input type="checkbox"/> B. Provide site lighting appropriate for the security needs of the site while maintaining an overall "low-lighting profile" for the complex.	Required	
<input type="checkbox"/> C. Use low cut off angles and down-lighting for landscaping or energy-conserving motion sensed lights for all site lighting. Special attention should be given to security lighting, loading docks, and entry.	Required	
<input type="checkbox"/> D. Where appropriate, install pedestrian safety lighting along public trails and walks.	1	
<input type="checkbox"/> E. Incorporate best management practices to honor goals of achieving Dark Sky Standards.	1	

II. Building Design & Energy Use	Maximum Value	Project Value
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1 Building Design

<input type="checkbox"/> A. At pedestrian areas of the building, use awnings, canopies, landscaping, windows and doors to lower the scale of the building.	Required	
<input type="checkbox"/> B. Design a principal façade and obvious main entrance parallel to the public street edge. Do not face blank walls towards public streets.	Required	
<input type="checkbox"/> C. Where possible, orient buildings on an east-west access to allow for maximum daylighting benefits.	1	
<input type="checkbox"/> 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, EIFS, imitation stone, and reflective glass are discouraged.	Required	
<input type="checkbox"/> 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.	Required	
<input type="checkbox"/> F. Screen sources of mechanical noise, odors and loading operations from public open space areas and adjacent properties.	Required	
<input type="checkbox"/> G. Locate utility meters and exhaust vents on the side or rear of building.	1	
<input type="checkbox"/> H. Screen or locate roof-top mechanical equipment so it is not visible from the street and trails.	Required	
<input type="checkbox"/> 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.	1	
<input type="checkbox"/> J. Locate fresh air intake locations away from loading docks, HVAC exhaust, and any location where vehicles may idle.	1	

Appendix 1: Menomonee Valley Sustainable Design Guidelines Evaluation Form

2 Energy Efficiency

<input type="checkbox"/> A. Meet current ASHRAE 90.1 for energy efficiency. Strategies may include the following, among others: <ul style="list-style-type: none"> ● 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. 	1	
	1	
	1	
	1	
	1	
<input type="checkbox"/> B. Specify Energy Star equipment and appliances and purchase EPEAT-registered electronics (www.epeat.net)	1	
<input type="checkbox"/> 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	1	
<input type="checkbox"/> D. Install meters for sub-metering.	1	

3 Daylighting and Interior Lighting

<input type="checkbox"/> A. A minimum of 75% of occupied interior spaces to be daylit through the following strategies: <ul style="list-style-type: none"> <input type="checkbox"/> i. Maximize window height, and use roof monitors, clerestory windows, skylights, and light-pipe technology to transmit light to spaces not reachable by other means. <input type="checkbox"/> ii. Balance glazing color for view, daylight and energy performance. Choose clear, transparent glass to allow for double panes and energy efficiency. <input type="checkbox"/> iii. Use interior windows, light shelves and low partitions to bring daylight deeper into the space, manage glare, and balance light levels. <input type="checkbox"/> iv. Use south-facing windows with appropriate overhangs to reduce summer sun and admit winter sun. 	1	
	1	
	1	
	1	
	1	
<input type="checkbox"/> B. Perform a photometric analysis of the floor plate for lighting (1 pt) and daylighting (1 pt).	2	
<input type="checkbox"/> C. Supplement daylighting with highly efficient electric light distribution that improves visual quality while reducing electricity use. Including: <ul style="list-style-type: none"> <input type="checkbox"/> i. Rely on low ambient lighting levels for general illumination (predominantly 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/ft². <input type="checkbox"/> ii. Use high efficiency lamps and luminaires or LED's with electronic ballasts. <input type="checkbox"/> iii. Employ efficiency-based controls such as dimmers, occupancy sensors, and lumen maintenance controls that can also be programmed for daylighting. <input type="checkbox"/> iv. Wire luminaires parallel to walls with windows so they can be dimmed or turned off by row. 	1	
	1	
	1	
	1	
	1	

Appendix 1: Menomonee Valley Sustainable Design Guidelines Evaluation Form

4 Alternative Energy

<input type="checkbox"/> A. Purchase power generated from renewable sources (solar, wind, biomass, steam, or low impact hydro sources) through renewable energy credits (RECs.)	1	
<input type="checkbox"/> 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.	1	
<input type="checkbox"/> C. Install onsite renewable energy generation for a minimum of 5% energy demand.	1	

5 Building Commissioning (Quality Control)

<input type="checkbox"/> 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 building engineer train building staff to operate and maintain the building.	1	
<input type="checkbox"/> B. Use long-term continuous measurement of performance for building and site systems.	1	

III. Materials & Resources	Maximum Value	Project Value
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1 Exterior and Interior Materials

<input type="checkbox"/> A. Achieve the following building goals: <ul style="list-style-type: none"> ● Use 35% materials with post-consumer and post-industrial 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. 	1	
	1	
	1	
<input type="checkbox"/> B. Specify mold- and moisture-inhibiting construction materials.	1	
<input type="checkbox"/> C. Within air barrier, use paints, coatings, sealings, and adhesives that are certified by Green Seal as low- or no-VOC and chemical component limits.	1	
<input type="checkbox"/> D. Use carpet systems that meet the requirements of the Carpet and Rug Institute's Green Label Indoor Air Quality Test Program.	1	
<input type="checkbox"/> E. Use composite wood and agrifiber products that do not contain added urea-formaldehyde resins.	1	
<input type="checkbox"/> 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.	1	
<input type="checkbox"/> G. Use CFC-free HVAC&R equipment.	1	

Appendix 1: Menomonee Valley Sustainable Design Guidelines Evaluation Form

2 Water Conservation

<input type="checkbox"/> A. Employ whole-building design strategies and use the following high-efficiency plumbing fixtures to reduce aggregate water use:		
<input type="checkbox"/> i. 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.	1	
<input type="checkbox"/> ii. Install ultra low flow, low flow, or dual plumbing fixtures.	1	
<input type="checkbox"/> B. Install a cooling tower.	1	
<input type="checkbox"/> C. Fully implement the Alliance for Water Stewardship Standard.	1	
<input type="checkbox"/> D. Ensure any leaking or lead laterals are replaced to ensure healthy and safe drinking water for building occupants.	1	

IV. Construction & Demolition	Maximum Value	Project Value
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1 Waste and Recycling

<input type="checkbox"/> A. Implement a Construction and 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: <ul style="list-style-type: none"> ● An approved neutral third party organization, like WasteCap Resource Solutions, should be used as Plan Manager. If a person is certified by WasteCap through their 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, like WasteCap Resource Solutions, 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. 	Required	
<input type="checkbox"/> B. Salvage 80% of existing building materials for reuse or resale.	1	
<input type="checkbox"/> C. Salvage 90% of of construction, demolition, and land clearance waste..	1	

Appendix 1: Menomonee Valley Sustainable Design Guidelines Evaluation Form

2 Erosion and Dust Control

<input type="checkbox"/> A. Follow Wisconsin Administrative Code NR 216 and City of Milwaukee Chapter 290 to control erosion regardless of the size of land disturbance.	Required
<input type="checkbox"/> B. Create an erosion control plan that conforms to the best management practices (BMPs) in the EPA's Storm Water Management for Construction Activities (or local regulations if they meet or exceed the EPA standards)	Required

3 Pre-Occupancy Controls for Indoor Air Quality

<input type="checkbox"/> A. Protect stored on-site or installed absorptive materials from moisture damage and mold, and replace all filtration media immediately prior to occupancy.	1	
<input type="checkbox"/> B. Install wet materials before dry in construction sequence to reduce indoor air pollutants.	1	

V. Indoor Environmental Quality	Maximum Value	Project Value
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1 Indoor Air Quality

<input type="checkbox"/> A. Demonstrate ventilation compliance at worst-case condition (i.e. supply fan at minimum speed and outdoor air damper at minimum position).	Required	
<input type="checkbox"/> 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.	Required	
<input type="checkbox"/> C. Prohibit smoking within 25 feet of entrances and post signs stating this. Provide a designated smoking area and receptacles for cigarette waste.	Required	
<input type="checkbox"/> D. Prepare an indoor air quality plan.	1	
<input type="checkbox"/> 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.	1	
<input type="checkbox"/> F. Increase ventilation to exceed air change effectiveness of 0.9 per most current ASHRAE standards.	1	
<input type="checkbox"/> G. Provide for the use of natural ventilation in transition seasons. Take advantage of cross ventilation, prevailing winds and stack effects when possible.	1	
<input type="checkbox"/> H. Provide mats or grills at entry areas to control dirt and dust.	1	
<input type="checkbox"/> 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.	1	
<input type="checkbox"/> J. Conduct a two-week flush of systems at 100% outside air before occupancy.	1	
<input type="checkbox"/> K. Use (UV) Ultra Violet light sources to keep heat exchangers and "A" Coils clean and running at peak efficiency.	1	

Appendix 1: Menomonee Valley Sustainable Design Guidelines Evaluation Form

2 Acoustic Quality

<input type="checkbox"/> A.	Maintain a maximum interior Noise Criteria of 35 decibels in occupied areas. Ceiling panels and carpeting can assist in absorbing sound.	1	
<input type="checkbox"/> B.	Place acoustic buffers (corridors, lobbies, stairwells, storage rooms, etc.) and sound-insulated partitions between noise-producing spaces and noise-sensitive areas.	1	
<input type="checkbox"/> C.	Place vibrating equipment on isolation pads and enclose in sound-absorbing walls, floors and ceilings.	1	
<input type="checkbox"/> D.	Maintain a maximum external decibel reading of 50 db at property line.	1	
<input type="checkbox"/> E.	In areas of high ambient noise, specify windows rated at an STC of 40 or better.	1	
<input type="checkbox"/> F.	In other areas, specify windows rated at 35 or better.	1	

VI. Operations & Maintenance	Maximum Value	Project Value
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1 Operations Manual and Monitoring

<input type="checkbox"/> A.	Prepare a Building Operating Plan, Systems Narrative, Sequence of Operations, and a Preventative Maintenance Plan. Creation of a Systems Manual is optional. (For additional guidance: See LEED v4 Fundamental Commissioning for sections of Systems Manual.)	1	
<input type="checkbox"/> B.	Schedule regular systems review and maintenance.	1	
<input type="checkbox"/> C.	Prepare an operational waste prevention and recycling plan.	1	

Appendix 1: Menomonee Valley Sustainable Design Guidelines Evaluation Form

2 Facility Maintenance

<input type="checkbox"/> A. Maintain healthy and efficient custodial operations using Green Seal or equivalent cleaning products.	1	
<input type="checkbox"/> B. Frequently inspect for fungus and molds.	1	
<input type="checkbox"/> C. Form an in-house "Green Team" to raise awareness of workplace associated environmental concerns.	1	
<input type="checkbox"/> D. Provide dedicated areas for the collection and storage of recyclable materials for the entire building.	1	
<input type="checkbox"/> E. Do not store materials, products or equipment outdoors, except finished product in transit and company-owned vehicles.	1	

3 Maintenance and Stewardship of Site and Landscape Elements

<input type="checkbox"/> 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.	1	
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	Sub-Totals	Maximum Value	Project Value
I. Site Design		13	0
II. Building Design & Energy Use		28	0
III. Materials & Resources		14	0
IV. Construction & Demolition		4	0
V. Indoor Environmental Quality		14	0
VI. Operations & Maintenance		9	0
	Totals	82	0
	Compliance Target	85%	0

Signed by:	Date:	30% Project
Signed by:	Date:	60% Project
Signed by:	Date:	90% Project

Appendix 2: Menomonee Valley Species Palette

Menomonee Valley Species Palette

March 2006

Updated July 2006

Updated August 2006

Updated April 2007

Appendix A. Native Plant Palette – Trees and Shrubs

Use true native species of local or regional genotype/ecotype, rather than named cultivars. Preferably sexually propagated; if not available, then locally native selections. Specifying locally-grown plants ensures that the plants you receive are acclimatized to local conditions, and decreases the failure rate of plantings.

Trees

<i>Acer rubrum</i>	Red Maple
<i>Acer saccharinum</i>	Silver Maple
<i>Acer saccharum</i>	Sugar Maple
<i>Amelanchier arborea</i>	Serviceberry
<i>Amelanchier laevis</i>	Shadblow
<i>Betula alleghaniensis</i>	Yellow Birch
<i>Betula papyrifera</i>	Paper Birch
<i>Carpinus caroliniana</i>	Musclewood
<i>Carya cordiformis</i>	Bitternut Hickory
<i>Carya ovata</i>	Shagbark Hickory
<i>Celtis occidentalis</i>	Hackberry
<i>Cornus alternifolia</i>	Pagoda Dogwood
<i>Crataegus crusgalli</i>	Hawthorn
<i>Euonymus atropurpurea</i>	Eastern Wahoo
<i>Fagus grandifolia</i>	American Beech
<i>Fraxinus Americana</i>	White Ash
<i>Fraxinus pensylvanica</i>	Green Ash
<i>Gleditsia triacanthos</i>	Honey Locust
<i>Gymnocladus dioica</i>	Kentucky Coffee Tree
<i>Juniperus virginiana</i>	Eastern Redcedar
<i>Ostrya virginiana</i>	American Hophornbeam
<i>Platanus occidentalis</i>	Sycamore
<i>Populus deltoides</i>	Cottonwood
<i>Populus grandidentata</i>	Large-toothed Aspen
<i>Populus tremuloides</i>	Quaking Aspen
<i>Prunus americana</i>	American Plum
<i>Prunus serotina</i>	Black Cherry
<i>Prunus virginiana</i>	Chokecherry
<i>Quercus bicolor</i>	Swamp White Oak
<i>Quercus rubra</i>	Red Oak
<i>Salix nigra</i>	Black Willow
<i>Thuja occidentalis</i>	American White Cedar
<i>Tilia americana</i>	Basswood
<i>Ulmus americana</i>	American Elm

Appendix 2: Menomonee Valley Species Palette

Ulmus rubra

Slippery Elm

Shrubs

Amelanchier stolonifera

Amelanchier

Aronia prunifolia

Chokeberry

Cephalanthus occidentalis

Buttonbush

Comarum palustre

Marsh Cinquefoil

Cornus amomum

Silky Dogwood

Cornus racemosa

Gray Dogwood

Cornus stolonifera

Redosier Dogwood

Corylus americana

Hazelnut

Diervilla lonicera

Diervilla

Hamamelis virginiana

Witchhazel

Ilex verticillata

Winterberry

Juniperus communis

Common Juniper

Pentaphylloides floribunda

Shrubby Cinquefoil

Physocarpus opulifolius

Ninebark

Rosa blanda

Early Wild Rose

Rosa carolina

Pasture Rose

Rhus glabra

Smooth Sumac

Rhus typhina

Staghorn Sumac

Salix discolor

Pussy Willow

Salix interior

Sandbar Willow

Salix nigra

Black Willow

Sambucus canadensis

Elderberry

Shepherdia canadensis

Buffaloberry

Spiraea alba

Meadowsweet

Viburnum acerifolium

Maple-leaved Viburnum

Viburnum lentago

Nannyberry

Viburnum rafinesquianum

Arrowwood Viburnum

Viburnum trilobum

American Highbush Cranberry

Appendix 2: Menomonee Valley Species Palette

Appendix B. Native Plant Palette – Herbaceous

Use true native species of local or regional genotype/ecotype, rather than named cultivars. Specifying locally-grown plants ensures that the plants you receive are acclimatized to local conditions, and decreases the failure rate of plantings.

Native seedlings should be installed with a weak annual cover crop, to assist with the transition to native species cover and minimize weeds and erosion during establishment.

Example cover crop seed mix to be installed when seeding natives follows. Mix and rates should be adjusted appropriately for conditions.

Scientific Name	Common Name	Lb per acre
<i>Avena sativa</i>	Annual Oats	30
<i>Lolium multiflorum</i>	ANNUAL Rye	10
<i>Fagopyrum esculentum</i>	Annual Buckwheat	10
<i>Linum usitatissimum</i>	Annual Flax	10

Emergent aquatic conditions

Grasses/Sedges/Rushes

<i>Scirpus fluviatilis</i>	River Bulrush
<i>Scirpus validus creber</i>	Softstem Bulrush
<i>Sparganium eurycarpum</i>	Common Burreed

Forbs

<i>Acorus calamus</i>	Sweet Flag
<i>Alisma subcordatum</i>	Water Plantain
<i>Iris virginica shrevei</i>	Blue Flag Iris
<i>Pontederia cordata</i>	Pickereel Weed
<i>Sagittaria latifolia</i>	Arrowhead

Wet sunny conditions (continually moist/wet)

Grasses/Sedges/Rushes

<i>Andropogon gerardii</i>	Big Bluestem
<i>Bromus ciliatus</i>	Fringed Brome
<i>Calamagrostis canadensis</i>	Bluejoint Grass
<i>Carex bebbii</i>	Bebb's Sedge
<i>Carex comosa</i>	Bristly Sedge
<i>Carex hystericina</i>	Bottlebrush Sedge
<i>Carex scoparia</i>	Pointed Broom Sedge
<i>Carex vulpinoidea</i>	Fox Sedge
<i>Elymus villosus</i>	Silky Rye
<i>Elymus virginicus</i>	Virginia Wild Rye
<i>Glyceria striata</i>	Fowl Manna Grass
<i>Juncus dudleyi</i>	Dudley's Rush

Appendix 2: Menomonee Valley Species Palette

<i>Juncus torreyi</i>	Torrey's Rush
<i>Leersia oryzoides</i>	Rice Cutgrass
<i>Panicum virgatum</i>	Switchgrass
<i>Scirpus atrovirens</i>	Green Bulrush
<i>Spartina pectinata</i>	Prairie Cordgrass

Forbs

<i>Acorus calamus</i>	Sweet Flag
<i>Alisma plantago-aquatica</i>	Water Plantain
<i>Angelica atropurpurea</i>	Angelica
<i>Asclepias incarnata</i>	Swamp Milkweed
<i>Aster laevis</i>	Smooth Blue Aster
<i>Aster novae-angliae</i>	New England Aster
<i>Aster puniceus</i>	Swamp Aster
<i>Aster simplex</i>	Panicled Aster
<i>Aster umbellatus</i>	Flat-top Aster
<i>Bidens cernua</i>	Nodding Bur Marigold
<i>Bidens coronata</i>	Tall Swamp Marigold
<i>Bidens frondosa</i>	Common Beggar's Tick
<i>Chelone glabra</i>	Turtlehead
<i>Cirsium muticum</i>	Swamp Thistle
<i>Epilobium coloratum</i>	Cinnamon Willow Herb
<i>Eupatorium maculatum</i>	Spotted Joepyeweed
<i>Eupatorium perfoliatum</i>	Boneset
<i>Gentiana andrewsii</i>	Bottle Gentian
<i>Helenium autumnale</i>	Sneezeweed
<i>Helianthus grosseserratus</i>	Sawtooth Sunflower
<i>Iris virginica-shrevei</i>	Wild Blueflag Iris
<i>Liatris pycnostachya</i>	Prairie Blazingstar
<i>Liatris spicata</i>	Marsh Blazingstar
<i>Lobelia siphilitica</i>	Great Blue Lobelia
<i>Lycopus americanus</i>	Common Water Horehound
<i>Lythrum alatum</i>	Winged Loosestrife
<i>Mimulus ringens</i>	Monkey Flower
<i>Monarda fistulosa</i>	Wild Bergamot
<i>Onoclea sensibilis</i>	Sensitive Fern
<i>Physostegia virginiana</i>	False Dragonhead
<i>Pycnanthemum virginianum</i>	Mountain Mint
<i>Ratibida pinnata</i>	Yellow Coneflower
<i>Rudbeckia hirta</i>	Black-eyed Susan
<i>Rudbeckia laciniata</i>	Cutleaf Coneflower
<i>Rudbeckia subtomentosa</i>	Sweet Blackeyed Susan
<i>Senecio aureus</i>	Golden Ragwort
<i>Silphium perfoliatum</i>	Cupplant
<i>Solidago graminifolia</i>	Grass-leaved Goldenrod
<i>Solidago riddellii</i>	Riddell's Goldenrod
<i>Thalictrum dasycarpum</i>	Meadow Rue
<i>Tradescantia ohimensis</i>	Spiderwort
<i>Verbena hastata</i>	Blue Vervain

Appendix 2: Menomonee Valley Species Palette

Vernonia fasciculata
Zizia aurea

Ironweed
Golden Alexander

Shrubs

Comarum palustre
Pentaphylloides floribunda

Marsh Cinquefoil
Shrubby Cinquefoil

Mesic sunny conditions

Typically seeded at 5-8 lb/acre for grasses
and 8-12 lb/acre for forbs.

Grasses/Sedges/Rushes

Andropogon gerardii
Bouteloua curtipendula
Bromus kalmii
Carex bicknellii
Elymus canadensis
Hierochloa hirta
Juncus tenuis
Muhlenbergia racemosa
Panicum virgatum
Sorghastrum nutans
Schizachyrium scoparium
Sporobolus heterolepis
Stipa spartea

Big Bluestem
Sideoats Gramma
Kalm's Brome
Bicknell's Sedge
Canada Wild Rye
Northern Sweetgrass
Path Rush
Wild Timothy
Switchgrass
Indian Grass
Little Bluestem
Prairie Dropseed
Needle Grass

Forbs

Agastache scrophulariaefolia
Anemone cylindrica
Aquilegia canadensis
Aster azureus
Aster laevis
Aster novae-angliae
Baptisia leucantha
Cacalia atriplicifolia
Cassia fasciculata
Coreopsis lanceolata
Coreopsis palmata
Desmodium canadense
Erigeron strigosus
Eryngium yuccifolium
Euphorbia corollata
Euthamia graminifolia
Frageria virginiana
Gaura biennis
Heliopsis helianthoides
Lespedeza capitata
Monarda fistulosa
Oenothera biennis

Purple Giant Hyssop
Thimbleweed
Columbine
Sky Blue Aster
Smooth Aster
New England Aster
Cream Wild Indigo
Pale Indian Plantain
Partridge Pea
Lance-leaved Coreopsis
Prairie Coreopsis
Canada Tick Trefoil
Daisy Fleabane
Rattlesnake Master
Flowering Spurge
Grassleaved Goldenrod
Wild Strawberry
Biennial Gaura
Oxeye Sunflower
Prairie Bush Clover
Wild Bergamot
Evening Primrose

Appendix 2: Menomonee Valley Species Palette

<i>Onoclea sensibilis</i>	Sensitive Fern
<i>Parthenium integrifolium</i>	Wild Quinine
<i>Penstemon digitalis</i>	Penstemon
<i>Petalostemum purpureum</i>	Purple Prairie Clover
<i>Potentilla arguta</i>	Prairie Cinquefoil
<i>Pteridium aquilinum</i>	Bracken Fern
<i>Ratibida pinnata</i>	Yellow Coneflower
<i>Rudbeckia hirta</i>	Black-eyed Susan
<i>Rudbeckia subtomentosa</i>	Sweet Blackeyed Susan
<i>Rudbeckia triloba</i>	Branched Coneflower
<i>Scrophularia lanceolata</i>	Early Figwort
<i>Scrophularia marilandica</i>	Late Figwort
<i>Silphium integrifolium</i>	Rosinweed
<i>Silphium laciniatum</i>	Compass Plant
<i>Silphium terebinthinaceum</i>	Prairie Dock
<i>Solidago rigida</i>	Stiff Goldenrod
<i>Solidago speciosa</i>	Showy Goldenrod
<i>Verbena hastata</i>	Blue Vervain
<i>Verbena stricta</i>	Hoary Vervain
<i>Verbena urticifolia</i>	Nettle-leaved Vervain
<i>Zizia aurea</i>	Golden Alexander

Mesic edge/shade conditions (be careful to match moisture conditions)

Grasses/Sedges/Rushes

<i>Carex blanda</i>	Common Wood Sedge
<i>Carex gracilima</i>	Graceful Sedge
<i>Carex granularis</i>	Limestone Meadow Sedge
<i>Elymus hystrix</i>	Bottlebrush Grass
<i>Elymus villosus</i>	Silky Wildrye
<i>Elymus virginicus</i>	Virginia Wildrye

Forbs/Ferns

<i>Allium canadense</i>	Wild Garlic
<i>Anemone canadensis</i>	Canada Anemone
<i>Anemone cylindrical</i>	Thimbleweed
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit
<i>Asclepias exaltata</i>	Poke Milkweed
<i>Aster shortii</i>	Short's Aster
<i>Botrychium virginianum</i>	Rattlesnake Fern
<i>Caltha palustris</i>	Marsh Marigold
<i>Campanula americana</i>	Tall Bellflower
<i>Cardamine laciniata</i>	Toothwort
<i>Circaea lutetiana</i>	Enchanter's Nightshade
<i>Echinocystis lobata</i>	Wild Cucumber
<i>Eurybia macrophylla</i>	Bigleaf Aster
<i>Frageria virginiana</i>	Wild Strawberry
<i>Galium triflorum</i>	Fragrant Bedstraw

Appendix 2: Menomonee Valley Species Palette

<i>Geranium maculatum</i>	Wild Geranium
<i>Geum canadense</i>	White Avens
<i>Hydrophyllum virginianum</i>	Virginia Waterleaf
<i>Impatiens capensis</i>	Jewelweed
<i>Iris virginica-shrevei</i>	Blueflag Iris
<i>Lobelia cardinalis</i>	Cardinal Flower
<i>Lobelia siphilitica</i>	Great Blue Lobelia
<i>Onoclea sensibilis</i>	Sensitive Fern
<i>Physostegia virginiana</i>	Obedient Plant
<i>Pilea pumila</i>	Clearweed
<i>Ranunculus hispidus</i>	Swamp Buttercup
<i>Rudbeckia laciniata</i>	Cutleaf Coneflower, Goldenglow
<i>Solidago flexicaulis</i>	Zigzag Goldenrod
<i>Symplocarpus foetidus</i>	Skunk Cabbage
<i>Teucrium canadense</i>	American Germander
<i>Triosteum perfoliatum</i>	Late Horsegentian

Appendix C. Low-mow grass mixes for use in small turf areas.

Use a low-mow low-maintenance turf grass mix that does not require or use irrigation. Seed mix should be at least 50% of a blend of Fine Fescue species (e.g. Chewings Fescue, Sheep Fescue) with no more than 50% Kentucky Bluegrass, seeded with an Annual Rye cover crop. These seed mixes are readily commercially available.