

# Applicability

With the expansion of the legislation in 2008 to include major renovations, the two main types of projects subject to B3 Guidelines are New Buildings and Major Renovations. Each has their own criteria for required use.

## **New Buildings Applicability Criteria:**

All new buildings funded in whole or part by Minnesota bond monies after January 1, 2004 must comply with B3 Guidelines. Additions are considered New Buildings that require compliance with B3 Guidelines if they have both of the following characteristics:

- Either not heated, or if heated the addition has its own heating plant(s) (e.g., boiler, etc.) whether or not its source of energy (e.g., fuel) is from an adjacent building.
- Either not cooled, or if cooled, the addition has its own cooling plant(s) (e.g., chiller, rooftop unit, etc.) whether or not its source of energy (e.g., electricity) is from an adjacent building.

Exceptions to compliance with the B3 Guidelines as a whole are *not* allowed based on size of building, number of utility connections, or whether a building is heated, cooled or electrically lit. However, some individual guideline criteria have detailed applicability criteria.

## **Major Renovations Applicability Criteria:**

All Major Renovation work funded in whole or part by Minnesota bond monies after January 1, 2009 must comply with the guidelines. Renovation work is considered under Major Renovations and requires compliance with the guidelines if it has both of the following characteristics:

- Renovated area includes 10,000 square feet or more.
- It encompasses at least the replacement of the mechanical, ventilation, or cooling system of the building, or a section of the building.

Exceptions to compliance with the B3 Guidelines as a whole are *not* allowed based on number of utility connections, or whether the renovated area is heated, cooled, or electrically lit. However, some individual guideline criteria are customized based on these or other project characteristics, including the scope of renovation work.

## **Not-Applicable versus Not Compliant Status:**

Any construction project receiving relevant funds but which fails to meet either of the applicability criteria listed above may apply for a Non-Applicable designation. This is done by complete a Non-Applicability Request Form (available from the B3 Project Website). This request process is used to determine whether the B3 Guidelines apply to a project. Submission of this form is not needed if a project is following the B3 Guidelines. Projects receiving relevant funding which are not following the guidelines and have submitted a Non-Applicability Request Form but have not yet received a Not Applicable designation will be noted as “pending” until status can be determined. If the B3 Guidelines Administrators determines that the B3 Guidelines do apply to a project but the project is not following B3 Guidelines, that project will be listed as Not Compliant on the B3 Case Studies Database.

The table below distinguishes requirements for New Buildings from requirements for Major Renovations, while allowing reference to a common master set of guidelines. The table also lists which guidelines are required for different types of renovations.

Guideline		New Buildings	Major Renovations
<b>Performance Management</b>			
P.1	Design and Construction Process	Required	Required
P.2	Operations Process	Required	Required
<b>Site and Water</b>			
S.1	Site and Water Connections	Required	Required for Minimum Site Scope (See Guideline)
S.2	Site Water Quality and Efficiency	Required	Required for Minimum Site Scope (See Guideline)
S.3	Soil	Required	Required for Minimum Site Scope (See Guideline)
S.4	Vegetation	Required	Required for Minimum Site Scope (See Guideline)
S.5	Animal Habitat Support	Required	Required for Minimum Site Scope (See Guideline)
<b>Energy and Atmosphere</b>			
E.1	Energy Efficiency	Required	Required
E.2	Renewable Energy	Required	Required for Minimum Project Scope (See Guideline)
E.3	Efficient Equipment and Appliances	Required	Required
E.4	Atmospheric Protection	Required	Required for new equipment
E.5	EV-Ready	Required	Required for Minimum Project Scope (See Guideline)
<b>Indoor Environmental Quality</b>			
I.1	Low-Emitting Materials	Required	Required for Newly Installed Materials
I.2	Moisture and Water Control	Required	Required if Exterior Envelope is in Scope
I.3	Ventilation	Required	Required
I.4	Thermal Comfort	Required	Required
I.5	Lighting and Daylighting	Required	Required
I.6	Effective Acoustics	Required	Required
I.7	View Space and Window Access	Required	Required
I.8	Ergonomics and Physical Activity	Required	Required
I.9	Wayfinding and Universal Access	Required	Required
<b>Materials and Waste</b>			
M.1	Life Cycle Assessment of Materials	Required	Required (Partial - See Guideline)
M.2	Environmentally Preferable Materials	Required	Required
M.3	Waste Reduction and Management	Required	Required
M.4	Health	Required	Required

Further detail on applicability criteria is listed under individual guidelines. Renovation projects may still request exemption from specific guidelines if they relate to work outside the project scope, contact B3 Guidelines Administrators for more detail.

## Guideline S.5: Animal Habitat Support

### Intent

To protect and support site animal habitat resilience by reducing the negative impact of the built environment on animal species and providing supportive environments for at-risk native species that are essential to ecosystem health.

### Required Performance Criteria

Guidelines S.5A through S.5F apply to all projects with new or renovated glazing within project scope. Other guidelines apply to all projects designated New Buildings and Major Renovations with site work site scope that includes an area of site disturbance that is greater than 3,000 s.f. OR Area of imperviousness (footprint of building plus site impervious area) renovated that is greater than 2,000 s.f..

A. Bird safety: Whole Building Threat Factor (WBTF)

The WBTF must be less than or equal to WBTF 45 for sites not designated critical. The WBTF must be less than or equal to 15 for critical sites. The WBTF is calculated through the B3 Guidelines Bird-Safe Design Calculator (Appendix S-5a). This calculator will also assist in determining compliance with S.5B, S.5C, S.5D, and S.5I (if pursuing).

B. Bird safety: Non-Enclosure Threat Factor (NETF)

The NETF must be less than or equal to 45. Use the B3 Guidelines Bird-Safe Design Calculator to determine NETF for non-enclosure surfaces.

C. Bird safety: High Risk Surfaces

The portion of the building considered a High Risk Surface may not include a material with a threat factor of 75 or greater in more than 15% of its surface area. A High Risk Surface is defined as:

1. Any condition that offers a view from exterior to exterior that is greater than 20 ft. across, such as a large atrium or glazed corners.
2. A surface within 50 ft. or less of attractants such as trees, shrubs, prairie, grassland, or open water (including green roofs with this type of vegetation).

D. Bird safety: traps

No portion of the building considered a trap may include any glazing with a threat factor (TF) greater than 25: For the purposes of these guidelines, the following conditions are considered traps:

1. Transparent exterior railings where all surfaces are exposed to exterior.
2. Transparent-sided walkways (e.g., skyways, covered walks with glass on two sides).
3. Any condition that offers a view from exterior to exterior that is 20 ft. or less across, such as a small atrium or glazed corners.

E. Bird safety: Lights Out management procedure

Follow the Lights Out light management program, which addresses operation of lights at night for specified times and dates of bird migrations. Note that this procedure is also required by law for state-owned and managed buildings. The program advises turning off building lighting including but not limited to: architectural lighting at top of building; uplighting; interior lighting, especially on upper floors; and lobby or atrium lighting during times and dates listed below.

1. Dates: between March 15 and May 31 and between August 15 and October 31 each year.
2. Times: between midnight and dawn.
3. Exception: lights that have been documented as necessary for normal use of the building between midnight and dawn may be operated.

F. Bird safety: first-year monitoring

For one year after construction/occupancy, the perimeter of the building(s) should be walked and all accessible setbacks and roof areas observed at least twice per week. Activity and findings should be surveyed and documented as listed in Appendix S-5f Bird-Safe Monitoring Worksheets.

G. Protection of rare, threatened, or endangered species:

If the project site is within 2 miles of a Minnesota state rare, threatened, or endangered species, the project team must create and execute a Minnesota state rare, threatened, or endangered species protection plan for those species on the project site, in coordination with MBS staff at the DNR. This shall include the following:

1. A perimeter exclusion fence a minimum of 42 in. tall.
2. A permanent outdoor interpretive sign of dimensions greater than 24 in. by 36 in. that references the site's identified rare, threatened, or endangered species using Tilden's 5 Principles of Interpretation.
3. An O&M manual to vigorously protect species, with instructions on how to enhance the vigor of the subject species until delisting.
4. Supportive habitat for the noted species, aggregated into largest single units with least perimeter.
5. Management practices for the subject site designed to protect and enhance the viability of rare, threatened, or endangered species until that species is delisted. Requirements may include avoidance, buffers, management with fire, elimination of fertilizers and invasive species, and/or artificial drainage.

H. The following provisions for animal habitat should be included in design:

1. Water features with the following characteristics are required for all B3 sites subject to the listed exclusions:
  - i. Open year-round (e.g., an aerator may be required to ensure that at least 10% of the water feature is accessible year-round).
  - ii. Gently sloped (<10% grade) access for a 5-ft. horizontal distance.
  - iii. Sites with limited ledges and sharp drop-offs.
  - iv. For water features, the primary water source should be roof-collected rainwater, supplemented by treated greywater and potable water as necessary to maintain water feature.
  - v. Water features are not required for sites within 500 ft. of an existing natural water body of at least 1 acre in size or a stream at least 10 ft. in width.
  - vi. Size requirements as follows, for listed nonbuilding area:

Size of Site	Size of Water Feature (in Square Feet)	Maximum Depth of Feature (in Inches)	Size of Feature of Under 2" Depth (in Square Feet)	Percent of Perimeter with Gently Sloped (Under 10% Grade) Access
Less than 1 Acre	100	12	50	50%
1 to 3 Acres	300	12	100	50%
3 to 5 Acres	500	24	200	40%
5 to 10 Acres	2,000	24	200	30%
10 to 20 Acres	8,000	36	1000	30%
20 to 40 Acres	16,000	n/a	2000	30%
More than 40 Acres	15% of site area	n/a	15% of water feature area	20%

2. If the project site is either greater than 3 acres in size or if the site is adjacent to or adjoining a permanent surface water body, natural bat habitat enhancement should be installed and maintained, including implementation of the following:
  - i. Multiple standing snags (>10" DBH) and downed logs in all wooded areas of subject site.
  - ii. Bat boxes to provide roosting area for 80 colony roosting bats per acre of surface water and 40 colony roosting bats per acre of nonsurface water areas.
  - iii. Bat boxes within 100 ft. of permanent site water feature, facing south or southeast.
  - iv. During the fifth growing season following project opening, the number of bats on subject site should be observed and recorded. Bat habitat should be remediated if at least 50% of the bat boxes have not been used by at least one species of bat that season.
3. Reptile and amphibian habitat and breeding sites should be created with natural and human-made structures to achieve at least one amphibian and one reptile by the fifth growing season. Provide acceptable reptile and amphibian enhancement structures on a year-round basis, including implementation of the following:
  - i. Natural options: standing snags, brush piles, piles of leaf litter, downed log, haul-out logs in water bodies, large flat sunning stones in full sun, wood and rock mulches, sand and gravel baths on south slopes and in shallow water.
  - ii. Human-made options: stone snake or reptile hibernaculum; fabricated buried wood, stone or concrete reptile and amphibian dens; submerged Christmas tree reefs; wooden stream-bank lunkers.
  - iii. Any other reptile and amphibian habitat enhancement structures may be acceptable if they have been listed in peer-reviewed literature and approved by the B3 Guidelines Administrators.
  - iv. Limiting area of mown lawn to increase available reptile and amphibian habitat.
  - v. Avoiding use of pesticides that harm animals.
  - vi. Verifying the presence of reptile and amphibians during the fifth growing season following the project opening and during the monitoring period of March to November, for a period not to exceed 24 hours. A 48-hour bio-blast monitoring protocol is an acceptable methodology. Animals may be captured for monitoring purposes only, but limit time of handling to avoid stressing, injuring, or killing these temporarily captured animals. Remediate reptile and amphibian habitat if at least one reptile and one amphibian have not been observed.
4. Insect pollinator habitat should be created so that during the fifth growing season following the project opening, at least one butterfly, one bee, and one other insect pollinator shall be found on site using monitoring protocols during a 24-hour search. The site design should be remediated as necessary to achieve this if insect pollinators are not found during monitoring.
- I. The aggregate illumination level outlined under the most recent International Dark-Sky Association (IDA) IES Model Lighting Ordinance (MLO) should not be exceeded for the project's lighting zone.

## Recommended Performance Criteria

- J. A WBTF of less than or equal to 15 (see S.5A for more details).
- K. Enhanced bird-safe building monitoring, implementing one or more of the following:
  1. Continued monitoring performed under S.5F by one or more additional years.
  2. More surveys per week for the first or more years.
  3. Ongoing work with an organization such as Audubon Minnesota to collect and catalog birds found.

L. Bird-safe lighting design.

1. Lighting levels listed below are not exceeded for the listed environmental lighting zone.<sup>9</sup>

Environmental Lighting Zone	Description	Maximum Vertical Illuminance Levels [fc] at Property Line	Achieve the Following Light Distribution Characteristics
E1: Intrinsically Dark	Parks and residential areas where controlling light pollution is a high priority	0.1	Use luminaires with light distribution that meets IES's Full Cutoff Fixtures.
E2: Low Ambient Brightness	Outer urban and rural residential areas	0.1	Use luminaires with light distribution that meets IES's Cutoff Fixtures.
E3: Medium Ambient Brightness	Urban residential areas	0.2	Use luminaires with light distribution that meets IES's Semi-Cutoff Fixtures.
E4: High Ambient Brightness	Urban areas having both residential and commercial use and experiencing high levels of nighttime activity	0.6	Use luminaires with light distribution that meets IES's Cutoff Fixtures.

- i. For façade, display, sculptural, and sign lighting:

- (1) For luminaires of 3500 or more lumens, objects lit from above.

- (2) For luminaires of less than 3500 lumens, objects may be lit from below. An effort is made to minimize non-target light (and to maximize the percentage of uplight that falls on the target).

2. Create lighting control zones and provide lighting control devices for parking lot, security, and decorative and façade lighting so that each type of lighting can be controlled independently and can be turned off or reduced in response to reduced lighting needs during low use or nonuse periods. Clearly relate decisions to the Lights Out program.
3. Document bird-safe lighting design measures undertaken.

M. Bird-safe building narrative: A Bird-Safe Case Study Narrative Report documents and shares bird-safe efforts. (Use Appendix S-5m Bird-Safe Building Narrative Template or include a writeup with similar content.)

N. Limited use of pesticides site-wide, specifically eliminated within 300 ft. of the site's required permanent water feature and all other surface waters within 1,000 ft. of the site.

## Meeting the Guidelines

In Predesign and early design, the impact of glazing percentage on bird safety should be considered and evaluated. If the building use is likely to be associated with large glazed areas, consider if increased risk/adjustments are needed on highly vegetated sites. Additionally, an ecological assessment of the site that includes an evaluation of bird species, habitat, and migration patterns should be considered.

<sup>9</sup> Adapted from Illuminating Engineering Society of North America (IES) RP-33-99, using “post curfew” recommendations for all values to ensure that light trespass is minimized for each environmental zone.

Through the design process, identify attractant areas for birds on the site, plan deterrents for facades adjacent to attractants, and keep glazed areas of buildings greater than 50 ft. away from attractants. Configure building to minimize bird collision traps. Traps can include clear barriers, transparent railings, or other glazed see-through conditions. See guideline for complete conditions deemed to be traps.

Early designs should be evaluated with the Bird-Safe Calculator (Appendix S-5a) and designs should be adjusted to meet bird-safe criteria. Design should be checked against bird-safe criteria and the WBTF in the Bird-Safe Building Calculator update to confirm continued compliance.

As the construction documents are developed, continued compliance with all required and pursued recommended bird-safe criteria should be confirmed, adjusting documentation and design as needed.

Contract documents should include those features needed for bird-safe compliance, as calculated using the Bird-Safe Calculator (Appendix S-5a). Bidders should be made aware of specific requirements for sustainable construction according to the B3 Guidelines. Substitutions that would change the bird-safe performance of the building should be monitored, and any material substitutions should meet bird-safe performance criteria. Correct implementation of features affecting bird-safe performance should be confirmed according to drawings and specifications. Bird-safe first-year monitoring and Lights Out program criteria should also be implemented in the project documentation. A lighting engineer should be consulted regarding controls for lights to accommodate Lights Out program compliance.

Required first-year bird-safe monitoring should be performed, as should any recommended ongoing monitoring that was pursued, using Appendix S-5f for First-Year Building Monitoring. If pursuing Bird-Safe Case Study Narrative, coordinate with lighting engineer on documentation of lighting benefits anticipated from Lights Out program. Documentation of recommended bird-safe lighting design under S.5L Bird-Safe Lighting Design should also be considered.

Prior to any physical site activities including inspections, disturbance, or mobilization of the project site, the relevant DNR, Minnesota Heritage Division, CBS maps should be consulted to determine if there are any Minnesota state rare, threatened, or endangered species within 3 miles of the subject site. Minnesota state rare, threatened, or endangered species symbols are typically identified as ◊ animal or \* plant on the CBS maps.

If a Minnesota state rare, threatened, or endangered species is located within 5 miles of the project site, staff at the MBS of the DNR should determine the subject site's distance adjacency to a Minnesota state rare, threatened, or endangered species. If MBS DNR determines that the subject site is within 2 miles of a Minnesota state rare, threatened, or endangered species, the project team should be notified and informed of which plant or animal species is the Minnesota state rare, threatened, or endangered species. The project is then required to create a Minnesota state rare, threatened, or endangered species protection plan for those species on the subject site, in coordination with MBS staff at the DNR.

If bat boxes are required due to the site condition per guidelines, required bat boxes should be located so that the largest surface of the bat box has a south, west, or southeast aspect during the growing season (April–October), so that sun exposure on the bat box is a minimum of six hours per day. Bat boxes should not be mounted in shade and should be seasonally mounted and ready for use by bats no later than April 1. Bat boxes should be located on solid structures with a minimum of a 30-ft. distance from trees (do not mount on poles or trees, and do not mount on or adjacent to windmills). The bottom of bat box should be elevated a minimum of 15 ft. above the ground or at least 12 ft. above the top of nearest vegetation. Bat boxes should be sheltered from prevailing winds during the growing season. They should not be illuminated from above or below. They should not be located immediately above an asphalt road or parking lot. Fabricate larger (>24 in. x >24 in. x 8 in.) bat boxes from natural, dark colored untreated wood with rough surfaces throughout (cedar, cypress, redwood, juniper). Do not use polished or planed surfaces in the construction of bat boxes,

and do not attach wires or hardware mesh. Do not paint interiors or exteriors of bat boxes. Use closely spaced (~1/2 in.) multi-chambered bat boxes accessed by bats from below (see Bats Conservation International guidance). Provide a vertical landing pad immediately beneath bat box access point. Use black roofing, maintain waterproofing throughout, and tightly seal. Thoroughly caulk all site buildings adjacent to bat boxes to close openings smaller than a dime to eliminate accidental bat infestation. At year five, post-occupancy, monitor bat boxes to ensure at least 50% of bat boxes are occupied with bats. Report any incidences of white-nose syndrome on bats to DNR Nongame Wildlife. Clean bat boxes annually per Bat Conservation International bat box maintenance guidelines.

Insect-pollinated trees, shrubs, vines, and groundcovers which may be used to create insect pollinator habitats include:

- Spring and summer: cherries, plums, peaches (*Prunus* spp.), apples, crabapples (*Malus* spp.), pears (*Pyrus* spp.), persimmon (*Diospyros* spp.), hawthorns (*Craetagus* spp.), serviceberries (*Amelanchier* spp.), nannyberries (*Viburnum* spp.), honeysuckle (*Lonicera* spp.), holly (*Ilex* spp.), linden (*Tilia* spp.), catalpa (*Catalpa* spp.), dogwoods (*Cornus* spp.), willows (*Salix* spp.), redbud (*Cercis* spp.), hackberries (*Celtis* spp.), locusts (*Gleditsia* and *Robinia* spp.), elderberries (*Sambucus* spp.), magnolia (*Magnolia* spp.), tupelo (*Nyssa* spp.), tulip tree (*Liriodendron* spp.), horse chestnut (*Aesculus* spp.), hop tree (*Ptelea* spp.), mountain ash (*Sorbus* spp.), golden rain tree (*Koelreuteria* spp.), pagoda tree (*Sophora/Styphnolobium* spp.), silverbell (*Halesia* spp.), buttonbush (*Cephalanthus* spp.), New Jersey tea (*Ceanothus* spp.), lead plant (*Amorpha* spp.), grape vine (*Vitis* spp.), kiwi fruit (*Actinidia* spp.), trumpet creeper (*Campsis* spp.), raspberries (*Rubus* spp.), roses (*Rosa* spp.), blueberries, cranberries (*Vaccinium* spp.), strawberries (*Fragaria* spp.), prickly pear cactus (*Opuntia* spp.), stonecrop (*Sedum* spp.).

Insect-pollinated herbaceous perennials which may be used to create insect pollinator habitat include:

- Spring: lupine (*Lupinus* spp.), bloodroot (*Sanguinaria* spp.), buttercups (*Ranunculus* spp.), Dutchman's breeches (*Dicentra* spp.), columbine (*Aquilegia* spp.), Virginia bluebells (*Mertensia* spp.), spiderwort (*Tradescantia* spp.), lobelias (*Lobelia* spp.), golden alexanders (*Zizia* spp.).
- Summer: prairie clovers (*Petalostemum* spp.), milkweed (*Asclepius* spp.), wild bergamot (*Monarda* spp.), giant hysopp (*Agastache* spp.), beard tongue (*Penstemon* spp.), bush clovers (*Lespedeza* spp.), Canada milk-vetch (*Astragalus* spp.), Culver's root (*Veronicastrum* spp.), evening primrose (*Oenothera* spp.), ironweed (*Vernonia* spp.), false indigo bush (*Baptisia* spp.), tickseed (*Coreopsis* spp.), Canada tick trefoil (*Desmodium* spp.), obedient plant (*Physostegia* spp.), mountain mint (*Pycnanthemum* spp.), partridge pea (*Chamaecrista* spp.), yellow coneflower (*Rudbeckia* spp.), cup plant (*Silphium* spp.), Joe Pye weed (*Eupatorium/Eutrochium* spp.), blazing stars (*Liatris* spp.).
- Fall: asters (*Aster* spp.), sneezeweed (*Helenium* spp.), gentian (*Gentian* spp.), boneset (*Eupatorium* spp.), goldenrods (*Solidago* spp.), sunflowers (*Helianthus* spp.).

The lighting zone for the project can be determined by referencing the Joint IDA IES MLO dated June 15, 2011. Lighting zones include the following:

- LZ-0: No ambient lighting
- LZ-1: Low ambient lighting, or for other uses
- LZ-2: Moderate ambient lighting

The determination of the lighting zone and the calculated total site lumens for the site should be recorded. Site lighting requirements should be designed in accordance with the performance method allowed for the lighting zone and a project site plan submitted complying with the total site lumens for the selected light zone.



## Submittal Requirements

### Pre-design:

- S.5G: Submit DNR, Minnesota Heritage Division, CBS maps showing the boundary limits of subject site and the surrounding 5-mile distance in miles to nearest Minnesota rare, threatened, or endangered species. If dimensions show a Minnesota rare, threatened, or endangered species within 3 miles of subject site boundaries, obtain and submit a MBS determination on DNR letterhead of whether these species are at a distance less than 2 miles of the project site. If dimensions show a rare, threatened, or endangered species within a distance less than 2 miles of subject site boundaries based on MBS determination, obtain and submit a letter of cooperation from MBS staff to produce a joint rare, threatened or endangered species protection plan on dated DNR letterhead.

### Design:

- S.5A (and S.5J if pursuing): Submit WBTF (as calculated by Appendix S-5a), and preliminary version of Appendix S-5a.
- S.5B: Submit NETF (as calculated by Appendix S-5a), and upload of preliminary version of Appendix S-5a.
- S.5C: If the project includes new High Risk Surfaces, note that the area of that surface with a TF greater than 75 is less than guideline limits, and preliminary version of Appendix S-5a.
- S.5D: Submit traps TF (as calculated by Appendix S-5a), and upload preliminary version of Appendix S-5a.
- S.5G: If it has been determined that the project requirements are triggered for the protection of rare, threatened, or endangered species, include preliminary specification sections referencing design and installation of a perimeter exclusion fence a minimum of 42 in. tall and a permanent outdoor interpretive sign per guideline requirements. Also submit a joint rare, threatened, and/or endangered species protection plan cosigned by MBS staff on dated DNR letterhead, including details and specifications for site preparation (weed and erosion control), site drainage, and revegetation (seeding, planting, etc.) for this specialized NPC based on MBS DNR staff guidelines.
- S.5H: Submit preliminary site plan outlining guide requirements, including water feature, bat habitat, reptile and amphibian habitat, and pollinator habitat.
- S.5I: Lighting zone that most represents the surround site conditions of the project site and identified anticipated aggregate illumination level.

### Final Design:

- S.5A (and S.5I if pursuing): Submit WBTF (as calculated by Appendix S-5a), and final version of Appendix S-5a.
- S.5B: Submit NETF (as calculated by Appendix S-5a), and upload final version of Appendix S-5a.
- S.5C: If the project includes new High Risk Surfaces note that the area of that surface with a TF greater than 75 is less than guideline limits, and final version of Appendix S-5a.
- S.5D: Submit traps TF (as calculated by Appendix S-5a), and upload final version of Appendix S-5a.
- S.5G: If it has been determined that the project requirements are triggered for the protection of rare, threatened, or endangered species, include final specification sections referencing design and installation of a perimeter exclusion fence a minimum of 42 in. tall and a permanent outdoor interpretive sign per guideline requirements. Also submit a joint rare, threatened and/or endangered species protection plan cosigned by DNR MBS staff on dated DNR letterhead, including details and specifications for site preparation (weed and erosion control), site drainage, and revegetation (seeding, planting, etc.) for this specialized NPC based on MBS DNR staff guidelines and updated as needed from the design phase submission and incorporating all guidelines requirements.

- S.5L: Submit site plan outlining designed light levels demonstrating compliance with the guideline limits. Include narrative of lighting design and lighting control zones.
- S.5M: Submit Bird-Safe Case Study Narrative Report based on Appendix S-5m or using similar content.

#### Closeout:

- S.5A (and S.5J if pursuing): Ensure WBTF of installed condition meets guideline limits (as calculated by Appendix S-5a) and Appendix S-5a, updated as needed.
- S.5B: Submit NETF of installed condition (as calculated by Appendix S-5a), and upload final version of Appendix S-5a, updated as needed.
- S.5C: If the project includes new High Risk Surfaces, note that the area of that surface of installed condition with a TF greater than 75 is less than guideline limits and Appendix S-5a, update this as needed to reflect installed condition.
- S.5D: Traps TF of installed condition (as calculated by Appendix S-5a), and Appendix S-5a, updated as needed.
- S.5E: Verification of a Lights Out management program in place.
- S.5F: Verification that the facility operations team is aware of first-year monitoring requirements.
- S.5I: Lighting zone that most represents the surrounding site conditions and designed aggregate illumination level.

#### Occupancy – Submitted annually for ten years:

- S.5E: Verification of adherence to Lights Out management program.
- S.5F: (Year one only): Verification of first-year monitoring.
- S.5J: Documentation of enhanced bird-safe building monitoring.
- S.5H: Annual inventory, condition, and recovery rate of endangered species. At year five submit inventory of bat, reptile and amphibian, and pollinated populations to meet required performance criteria. Ensure at least 50% of bat boxes are occupied with bats. Remediate habitat if requirements are not met. Report any incidences of white-nose syndrome on bats to DNR Nongame Wildlife.
- S.5M: Documentation of operations pesticide limits and methods of ensuring compliance.

## Additional Resources

Appendix S-5a Bird-Safe Calculator

Appendix S-5f Bird-Safe Monitoring Worksheets

Appendix S-5m Bird-Safe Case Study Narrative Template

Bat Conservation International (BCI): <http://www.batcon.org/>.

Bird-Safe Building Guidelines by Audubon Minnesota and Project Birdsafe:  
<http://mn.audubon.org/conservation/birdsafe-buildings>.

Henderson, Carrol. 2010. *Woodworking for Wildlife*. Minnesota: MN DNR.

Henderson, Carrol. 1987. *Landscaping for Wildlife*. Minnesota: MN DNR.

Holm, Heather. 2014. *Pollinators of Native Plants: Attract, Observe, and Identify Pollinators and Beneficial Insects with Native Plants*. Minnesota: Pollination Press.

International Dark-Sky Association (IDA): [www.darksky.org](http://www.darksky.org), International Dark-Sky Association Joint IDA IES Model Lighting Ordinance: [http://www.darksky.org/wp-content/uploads/bsk-pdf-manager/16\\_MLO\\_FINAL\\_JUNE2011.PDF](http://www.darksky.org/wp-content/uploads/bsk-pdf-manager/16_MLO_FINAL_JUNE2011.PDF), Recommended Lighting Zones: <http://www.darksky.org/lighting/model-lighting-laws-policy/recommended-lighting->

[zones/](#), IDA Mapping Earth's Night One Picture at a Time: <http://www.darksky.org/mapping-earths-night-one-picture-at-a-time/>.

MN DNR, Ecological Classification System (select applicable ecosystem provinces, sections, subsection to download the complete plant lists): <http://www.dnr.state.mn.us/ecs/index.html>.

MN DNR, CBS Maps of Minnesota: <http://www.dnr.state.mn.us/eco/mcbs/maps.html>.

MN DNR, Invasive Species: <http://dnr.state.mn.us/invasives/terrestrialplants/index.html>.

MN DNR Pollinator BMPs and Habitat Restoration Guidelines:  
[http://files.dnr.state.mn.us/natural\\_resources/npc/2014\\_draft\\_pollinator\\_bmp\\_guidelines.pdf](http://files.dnr.state.mn.us/natural_resources/npc/2014_draft_pollinator_bmp_guidelines.pdf).

Minnesota County Biological Survey: [www.dnr.state.mn.us/mbs/index.html](http://www.dnr.state.mn.us/mbs/index.html).

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<http://www.revisor.leg.state.mn.us/laws/?id=101&doctype=Chapter&year=2009&type=0>.

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UMN Bee Lab "Plants for Minnesota Bees":  
[https://www.beelab.umn.edu/sites/beelab.umn.edu/files/plants\\_mn\\_bees.pdf](https://www.beelab.umn.edu/sites/beelab.umn.edu/files/plants_mn_bees.pdf).

Xerces Society Pollinator Conservation: <http://xerces.org/pollinator-conservation/>.

## Glossary

### **Brush Piles:**

Pile of topped or broken branches on the ground promoting insect-feeding bird habitat.

### **Tree Snag:**

A standing dead or dying tree often missing a top or most of the smaller branches, promoting insect-feeding bird habitat.

### **Gravel/Sand Baths:**

A shallow depression filled with evenly graded sand or gravel, above the toe of the slope to aid birds and small mammals in parasite removal.

### **Terraclium/Hibernaculum:**

Shelter occupied during winter by a cold-blooded dormant animal.

### **Christmas Tree Reefs:**

Human-made underwater structure build to promote aquatic habitat.

**Beaver Deceiver:**

Trapezoid protective fence upstream of pipe to eliminate beaver damming.

**Stream-Bank Lunkers:**

Three-sided, open framed, wooden fish crib installed directly into stream banks, anchored with steel rods, stone slabs and earth to create artificial cut bank for fish shelter/protection.

**Downed Tree Log:**

A length of trunk or large limb of felled tree to promote insect-feeding bird habitat and discourage unregulated mountain biking.

**Threat Factor (TF):**

Threat factor (TF), a property of a building material related to likelihood of bird collision, found in the TF Table (See Appendix S-5a). Consult the B3 Guidelines Administrators if you have questions on what TF should be used for a material.

**Traps:**

Traps are glazed conditions that are particularly likely to produce bird strikes. These are defined in the B3 Guidelines as any of the following: Transparent exterior railings (e.g., a glass or plexiglass panel in an exterior railing system), transparent-sided walkways (e.g., skyways with both sides glazed, covered walks with glazing on both sides), or any other condition where multiple transparent or translucent surfaces on the exterior of the project are separated by 20 ft. or less and which can be seen through simultaneously (e.g., a small atrium, or glazed corners).

**High Risk Surfaces:**

High Risk Surfaces are those surfaces within 50 ft. or less of attractants such as trees, shrubs, prairie, grassland, or open water, or any other condition where multiple transparent or translucent surfaces on the exterior of the project are separated by 20 ft. or more and which can be seen through simultaneously (e.g., a small atrium or glazed corners).

**Permanent Surface Water Body:**

Lake, pond, river, creek, stormwater pond.

**Solitary/Mason Bees:**

Provide untreated wooden drilled blocks with holes diameter ranging from 2–10 mm x 80–100 mm deep. Provide waterproof roof and mount on solid surface 48 in. (1,200 mm.) above ground. Replace blocks every 2 years.

**Critical Sites:**

For sites that include development of prime farmland, farmland of state significance, former municipal, township or county parkland, formerly federally protected lands, or that are on areas covered by a conservation easement, or that are on areas under a conservation easement, the only allowed activity is restoration to the original NPC, per the Minnesota CBS.