University of Washington
Bird-Friendly Campus Design Standards
Judy Bowes, College of the Built Environments, PI Bird-Friendly UW
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Introduction

Based on collision data gathered on the University of Washington Seattle campus at 22 buildings from September 2022 through March 2024, the following Bird-Friendly Design Standards are proposed to reduce bird mortalities related to collisions with transparent glass and reflective materials.

Minimum bird-safe standards can prevent many collisions by avoiding designing with collision "hot spots," designs that are highly conducive to collisions, or treating the "hot spots" with bird-safe patterns and designs. Minimum requirements should only be followed when budget or time constraints prevent treating most of the building's glass surface area. However, following the Recommended Standards is suggested to avoid most collisions. Complete bird-safe standards are included for projects that aim to be 100% bird-safe, preventing all possible collisions.

Approved Bird-Safe products consist of patterns applied to Surface 1 of the glass, spaced 5 cm apart or closer. Additional Bird-Safe options include opaque and textured glass, external designs such as external shades, mesh, or solar fins, and perforated film.

Minimum Bird-Safe Standards

The following design "hot spots" are to be avoided or treated with bird-safe glass or approved design options.

Transparent Railing

Avoid designing with transparent glass railings, as they are the deadliest design feature documented on the UW Seattle campus. If treating with bird-safe glass, the patterns must be spaced 5 cm apart or closer and applied to each exposed glass surface (both sides) of the total glass area.

Transparent Sky Bridges, Walkways, and Breezeway Windows

If the project cannot avoid designing sky bridges, walkways, and breezeways without transparent glass, bird-safe glass with patterns spaced 5 cm apart or closer must be applied to Surface 1 of the total glass area of the design feature(s).

Transparent and Reflective Glass Corners

If the project cannot avoid designing with transparent or reflective glass corners (including reflective materials such as mirrors or metals), bird-safe glass with patterns spaced 5 cm apart or closer must be used, and the pattern must extend 5 m out from the meeting point.

Parallel Transparent or Reflective Glass or Materials (Mirrors or Metals)

If the project cannot avoid designing with parallel transparent or reflective glass or materials, bird-safe glass with patterns spaced every 5 cm or closer must be used on all glass or reflective surface areas of the design(s).

Reflective Glass or Surfaces and Vegetation

Reflective surfaces within 20 m of vegetation or habitat space located near the building perimeter and reflective surfaces visibly reflecting vegetation or habitat space when standing within 0-100 m of the building perimeter must be treated with bird-safe design options.

Transparent Glass and Vegetation

Transparent glass surfaces within 3 m of vegetation or habitat space located near the building perimeter and vegetation (including interior vegetation) or habitat space visible through the transparent glass when standing within 0 - 100 m of the building perimeter.

Recommended Bird-Safe Standards

Recommended Bird-Safe Standards include the Minimum Bird-Safe Standards in addition to the following:

Building Height and Vegetation

All exterior transparent glass or reflective surface areas 0 - 15 m above grade or 7 m above mature canopy, whatever is greater, are to be treated with bird-safe design options.

For rooftop vegetation or habitat space, all exterior glass 0 - 7 m above mature vegetation is to be treated with bird-safe design options.

If habitat space is within 100 m of a building, it is highly recommended that the building treat transparent glass and reflective surfaces up to 75 m from grade to reduce collisions during migration seasons (Autumn, Winter, and Spring).

Artificial Lighting

(This applies to surfaces that do not use bird-safe glass or designs.)
Stories above the sixth story must turn out lights from dusk to dawn when not in use. The sixth story and below are encouraged to turn out lights from dusk to dawn and use timers or motion sensors to reduce light use after sunset. Required security lights or lighting needed during building use should consider drawing internal shades or blinds after dusk to minimize light pollution. Timers and motion-sensitive lighting may be used in lobbies, walkways, and corridors for safety.

External Lights

Timers and motion-sensitive lighting may be used for external security. If this is not possible, no exterior lights should point upwards or illuminate large areas of the building or structure. Avoid using red wavelengths, strobe lights, and bright white lights, and opt for green or blue wavelengths of lights when appropriate.

Complete Bird-Safe Standards

Complete Bird-Safe Standards include the Recommended and Minimum Bird-Safe Standards in addition to the following:

Bird-Safe glass and designs are used on all transparent glass and reflective surfaces.

Identify “bird traps,” such as pipes, ducts, or vents, and cover them with tight-weave mesh, screen, or netting to discourage nest building and prevent the entrapment of birds and other wildlife.

Bird-Safe Design Patterns

Bird-safe design patterns are to be spaced every 5 cm or closer, and markers or design lines must be at least 0.32 cm in diameter. All design patterns require placement on Surface 1 (the outermost surface) of the glass. Patterns can be etched or fused onto the glass surface. Frosted, textured, or patterned glass is bird-safe if not entirely transparent, or smooth surfaces larger than 5 cm wide are visible. Adhesive vinyl patterns in colors white, gray, or black can be applied before or after glass installation. However, color images on vinyl sheets or patterns on transparent vinyl sheets that cover the entire glass surface area are discouraged due to rapid degradation and discoloration. Bird-safe options that cover the entire glass surface area include screens or netting, exterior shades with openings less than 5 cm in diameter, and perforated vinyl.

Approved Bird-Safe Products

Viracon Bird-Friendly Glass:
(In order of effectiveness)
Print #50956, #2070, #51767, #51777, and #2824

Walker AviProtek:
(In order of effectiveness)
Opaque, Velour, and Satin Finishes
Patterns 211, 217, 215, and 226

Guardian Glass, Guardian Bird1st™ Etch:
Bird1st Etch DX22
Bird1st Etch SqX22

GlasPro:
(In order of effectiveness)
Frit with 20% White Dots
Frit with Horizontal Lines
FS 3002, FS 3000, FS 2000, and FS 2001

Feather Friendly:
Any 5 cm (or less) Spaced Design
Patterns include Harmony, Symmetry, Sequence, and Sunburst

Other Options:
Perforated film, screens, netting, and external shades or screens are available from various manufacturers. Etched or high contrast patterns spaced every 5 cm or less on Surface 1 of the glass.

Prohibited Products and Patterns

Ultraviolet (UV) Products
UV products should be avoided until further study indicates they are as or more effective than human-detectable products. Currently, UV products are, on average, less than 70% effective in perfect conditions, resulting in less reduction in collisions, particularly in overcast climates such as Seattle. Additional risks of using UV products include attracting birds that utilize UV to detect food sources, mates, and flock members; UV is not detectable by all birds equally and is less visible in overcast

conditions and at dawn/dusk. UV can potentially decrease wavelengths needed to balance human circadian rhythms and increase external temperatures due to increased reflectivity.

Internal Shades or Blinds
Angled Glass
Projections, Colored Lights, Strobing Lights or Reflective Strips/Shapes
Bird of Prey Images or Decoys
Audible Deterrence Methods
and
Patterns, decals, vinyl, lettering, mullions, or any other design feature spaced more than 5 cm apart.

Discouraged Guidelines

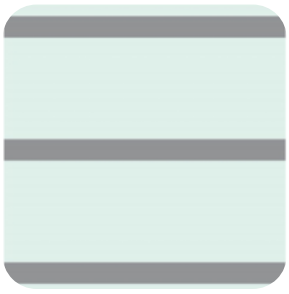
American Bird Conservancy (ABC)'s Threat Factor Ratings
After a thorough review comparing ABC's testing methods to case studies, the review found the threat factor was misleading, as the testing method overestimated the effectiveness of some products by up to 40%. A low threat factor does not guarantee its effectiveness in reducing collisions. Following the ABC guide alone is discouraged and should not be used as the only guideline for meeting LEED Pilot Credit's 55 requirements.

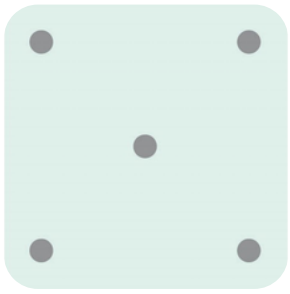
The "2x4 Rule"
The "2x4 Rule" is a spacing rule often recommended for bird-safe glass patterns. The rule suggests spacing patterns every 2 inches/5 cm horizontally and every 4 inches/10cm vertically will reduce most collisions. However, smaller birds and birds able to maneuver through small spaces are not protected. Spacing patterns every 5 cm or closer will protect all birds.

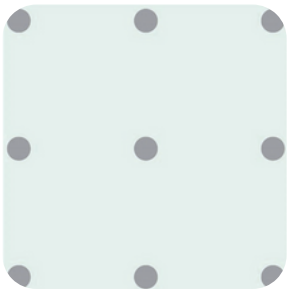
Image Guide: Approved Bird-Safe Products

Viracon Bird-Friendly Glass


Print #50956


Print #2070


Print #51767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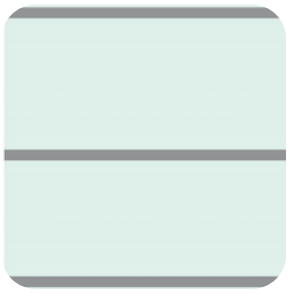
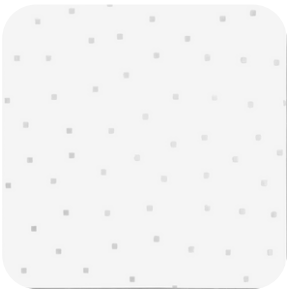

Print #2824

Walker AviProtek

Pattern 211


Pattern 217


Pattern 215


Pattern 226

Guardian Glass, Guardian Bird1st™ Etch


DX22


SqX22

GlasPro


Frit: 20% White Dots


Frit: Horizontal Lines

GlasPro

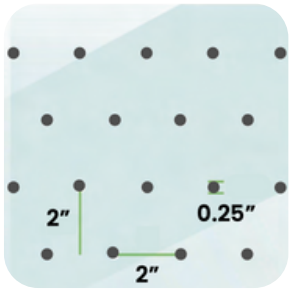

FS 3002


FS 3000

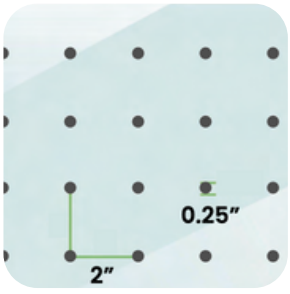

FS 2000


FS 2001

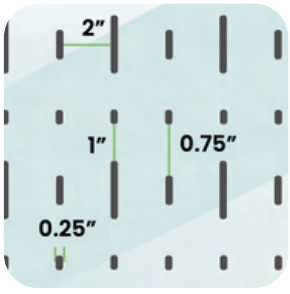
Feather Friendly



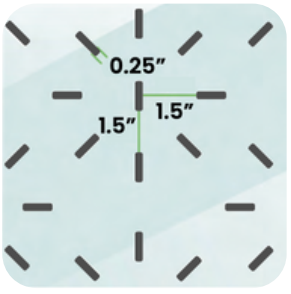
Harmony



Symmetry



Sequence



Sunburst