

Bird-Safe Building Strategies

How Bird-Safe Strategies Work

Strategies to decrease bird-window collisions work by decreasing the transparency and/or reflectivity of glass.

One set of strategies involves creating visual markers in glass that allow birds to perceive the glass as solid. Visual markers break up expanses of transparent or reflective glass.

Birds will fly into any space they perceive as being large enough for them to pass through. For most bird species, visual markers need to be separated no more than two inches vertically or four inches horizontally, as illustrated below.

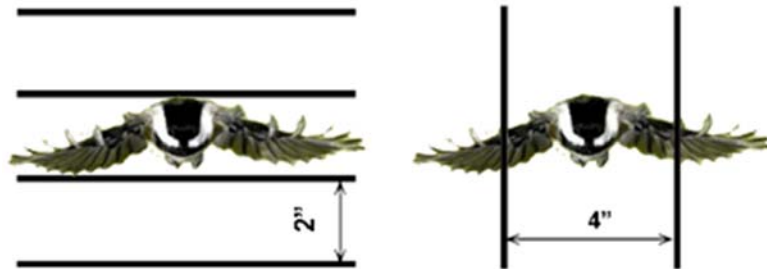


Illustration by Fatal Light Awareness Program (FLAP).

Visual markers in glass can be in any shape and pattern as long as they conform to this spacing standard. Patterns can be created through fritting, etching, stenciling, film, or decals. Because birds see in the ultraviolet (UV) spectrum, patterns can also be created through UV-reflective coating applied to the glass.

Another strategy is using glazing materials that are more readily perceived as solid, such as glass block or translucent glass, rather than transparent glass. Interior shades that are pulled down also create a solid appearance.

Netting can create visual markers as well as soften the potential impact of a bird colliding with a window.

Other bird-safe strategies function by decreasing the reflectivity of the glass. These include exterior shades, louvres, sunshades, and angled building facades.

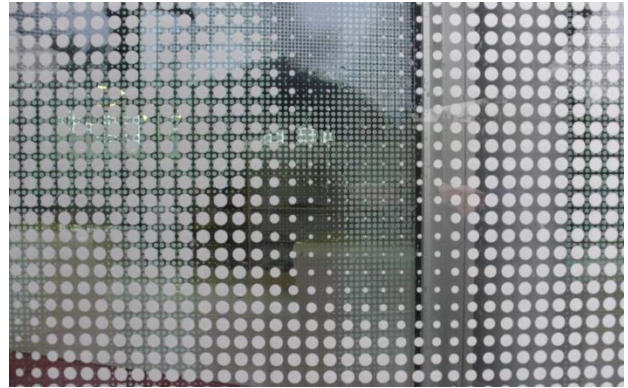
Photo Gallery

Fritted Glass

Fritting is a method of patterning glass by applying frit paint (made of minute glass particles, pigment, and a medium) to glass then firing the glass in a tempering furnace to create a permanent coating.



Fritting with vertical lines.



Fritting in a dot pattern.



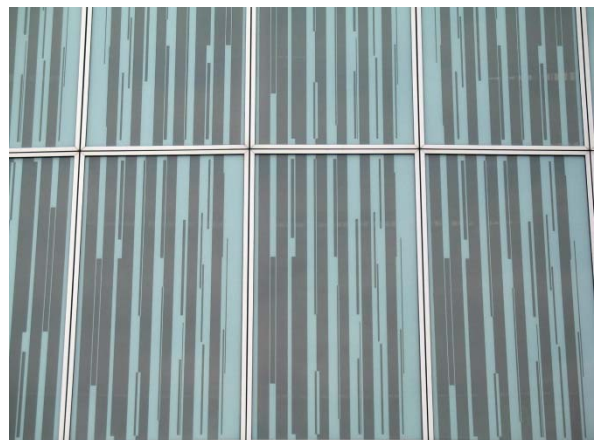
New bus shelters in San Francisco use glass with a subtle frit pattern called “SF Fog” to make them more visible.



Bus stop with fritted glass, King County, Washington.



Cathedral of Christ the Light, Oakland, CA.



Close-up of fritted glass on Cathedral of Christ the Light.

Fritted Glass *continued*



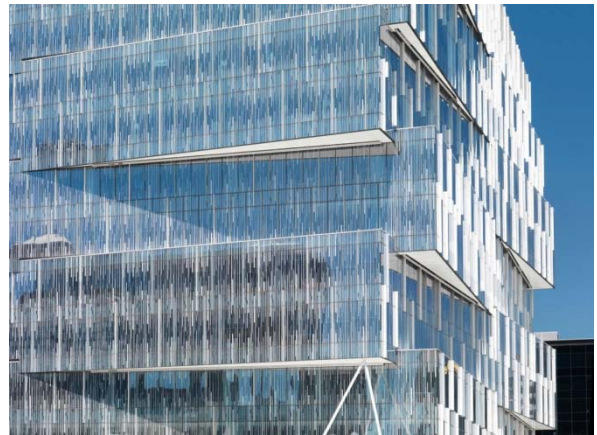
Minneapolis Central Library, Minneapolis, MN.



Interior view, Minneapolis Central Library.



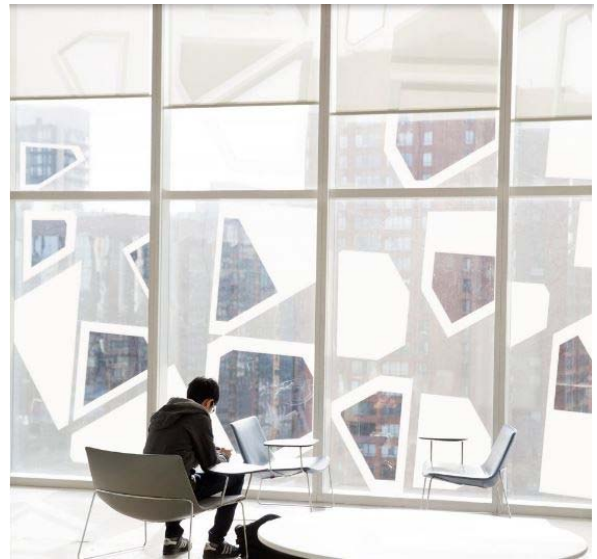
Glass facade with vertical frit pattern, University of British Columbia Library.



Seven17 Bourke Street Building, Melbourne, Australia.



Ryerson University Student Learning Centre, Toronto.



Ryerson University Student Learning Centre, Toronto.

UV-patterned Glass

Because birds see in the ultraviolet (UV) spectrum, visual markers for birds can be created by applying UV-reflective material to glass. The UV coating is visible to birds but invisible to humans.



This illustration from the maker of ORNILUX Bird Protection Glass simulates what a bird would see on glass coated with UV-reflective material. Photo courtesy of Arnold Glass.



An installation of UV-patterned glass on a storefront at 2175 Market Street, San Francisco, shows that the UV pattern on the glass is invisible to humans. Photo courtesy of Arnold Glass.

Glass with Photovoltaic Cells

Glass that incorporates photovoltaic cells (solar cells), is a relatively new technology considered to have promise not only for power generation but also for bird safety. The solar cells, sandwiched between two sheets of glass, can serve as visual markers.



Kankakee Community College, Kankakee, IL. Photovoltaic glass by Atlantis Energy Systems.



Transparent solar panels by Dynamic Solar Tech, Canada.

Window Films and Decals

Films and decals applied to the surface of glass can be an affordable and effective strategy for reducing bird-window collisions.



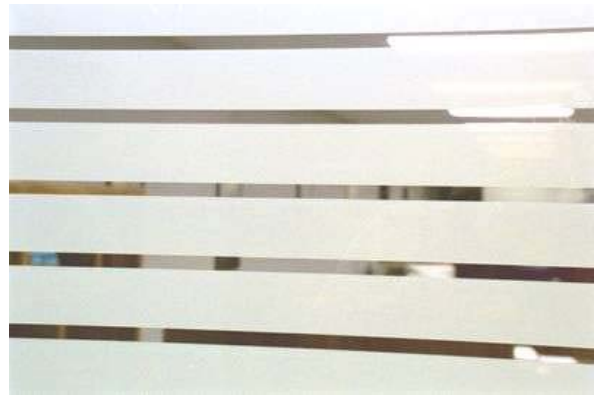
Window film with horizontal stripe pattern by Solyx.



Dots of bird tape by CollidEscape, a nonprofit organization dedicated to reducing window collisions.



Window film by 3M.



Horizontal window film pattern, Solyx.



Decorative window film by Denver Window Film.



Decorative window film.

Art Images

Art incorporated into glass (through applying window film, silk-screening, or other methods) can serve dual purposes of making the glass appear solid to birds.



This pattern was created with window film.



Illinois Institute of Technology, Chicago Student Center.



Silkscreened image on glass at City College of San Francisco, Chinatown Campus.



Silkscreened image on glass at City College of San Francisco, Chinatown Campus.

Translucent Glass

Translucent glass presents a more solid appearance than transparent glass. There are historic and modern examples.



Translucent transom windows, Park Street, Alameda.



Translucent transom windows, historic hotel building, Downtown Oakland



Translucent glass on portion of the storefront in a recently constructed mixed-use building, Berkeley.



Translucent windows, Target store, Alameda.



A modern and extensive application of translucent glass: Kunsthhaus, Bregenz, Austria.



A modern and extensive application of translucent glass: Nelson-Atkins Museum of Art, Kansas City, MO.

Glass Block

Glass block presents the appearance of a solid object to birds. Most popular in the middle of the 20th century, it also has been incorporated in some contemporary buildings.



Glass block comes in a variety of patterns.



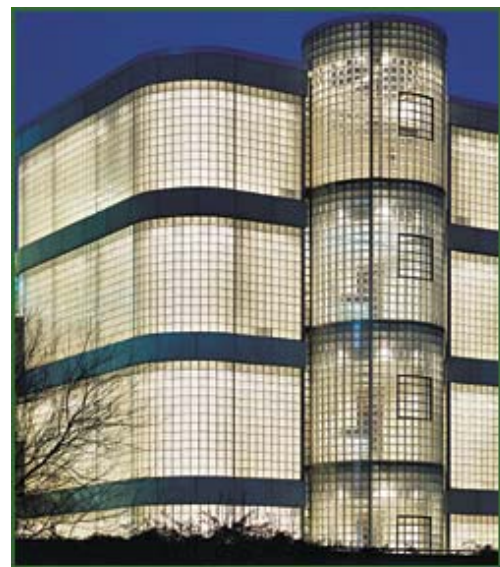
Glass block at first floor of commercial building across from Alameda City Hall.



Hecht Warehouse, Washington, DC.



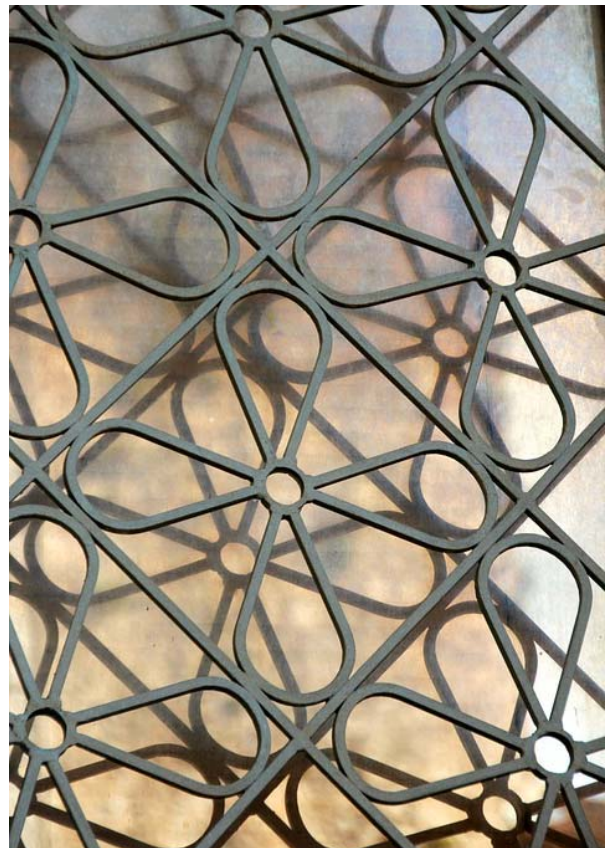
Modern building with glass block.



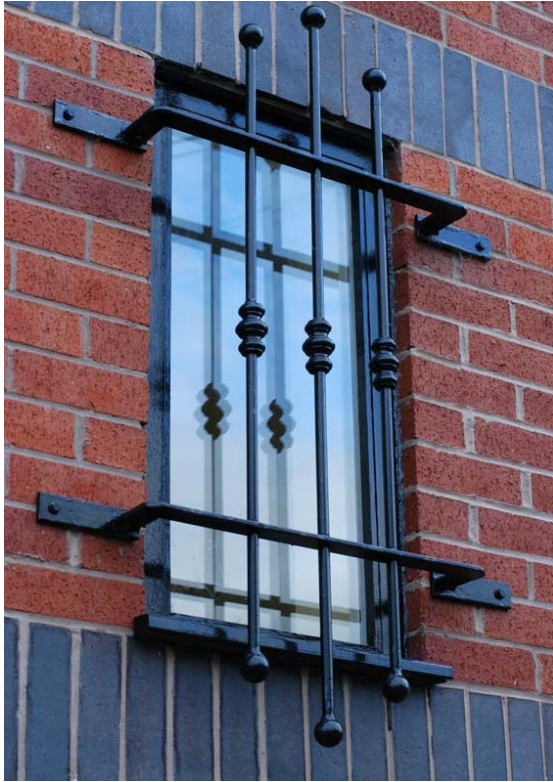
Modern building with glass block.

Decorative Grilles

Decorative grilles installed over window openings can serve as effective visual markers for birds as long as the elements are densely spaced enough. Grilles can be designed in a variety of patterns.



Decorative Grilles *continued*



Historic grille over glass door, Masonic Temple, Alameda.



This screen/grille on the New York Times Building doubles as a sign. It permits light into the building but presents as a solid object to birds.



Screen and sign, New York Times Building.

Mullions and Muntins

Common in historic buildings, divided-lite windows with closely spaced muntins also have modern applications. If the muntins are closely spaced enough, they can serve as visual markers and help birds perceive that they cannot fly into the glass.



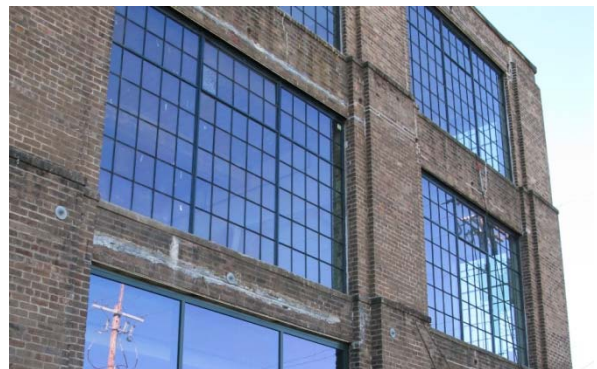
Window with closely spaced muntins and translucent glass, historic industrial building, Alameda Point.



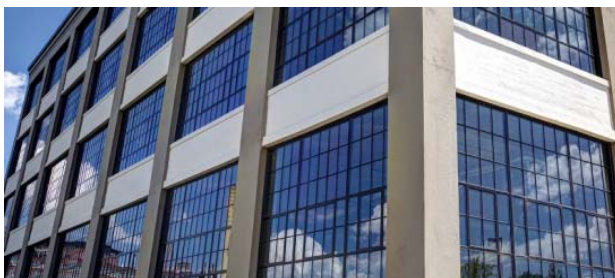
Steel sash windows in former hangar, Alameda Point.



Closely spaced mullions and translucent glass, downtown Oakland.



Older brick commercial building with mullions and muntins.



Modern building with divided-lite windows.



Modern building with divided-lite windows.

Exterior Screens

Exterior screens reduce window reflections. They can also provide a cushion between birds and windows.



Exterior screen by The Bird Screen Company.



Exterior roller screens by Envirolinds.



Exterior roller screens.

Interior Screens

Interior shades that are pulled down over windows give the windows a more solid appearance for birds.



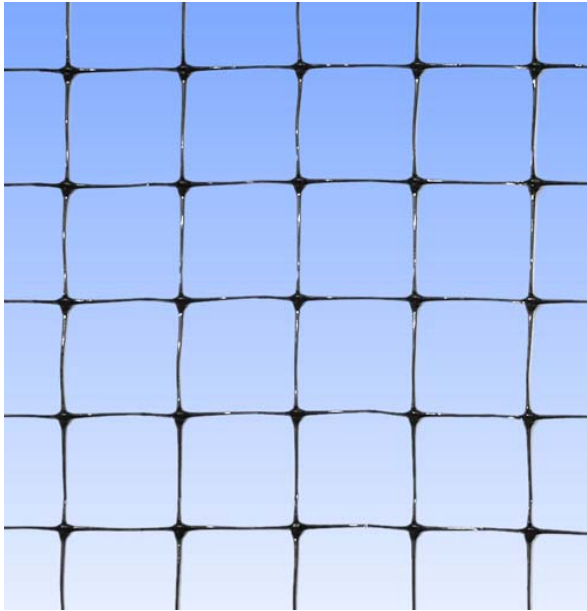
Interior screens on ground-floor windows, downtown Oakland.



Solar blinds as seen from interior of a library.

Bird Netting

Bird netting placed over windows can cushion bird strikes. Netting can be a good solution for historic buildings because it doesn't involve replacing windows.



Architectural Solutions—Angled Facades

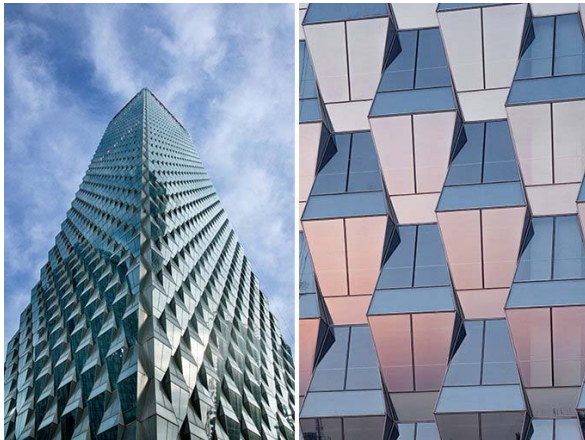
Angling glass facades reduces their reflectivity.



IAC Building, New York, NY, by Frank Gehry.



Korea Tower



Beijing Greenland Center.



Korea Tower



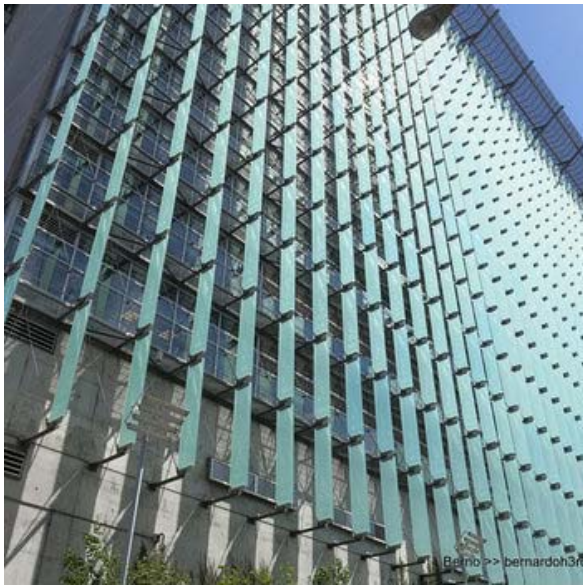
Angled façade.



Berkeley City College

Architectural Solutions—Sunshades and Louvres

Sunshades and louvres are intended to reduce the amount of energy required to cool buildings. By partially shading windows, they can also serve to reduce the reflections that present hazards to birds.



Sunshades, San Francisco Federal Building



Sunshades, University of Southern Denmark



Screens, Edith Green – Wendell Wyatt Federal Building, Portland, OR.



Sunshades, U. S. Census Bureau Headquarters, Suitland, MD



Louvres, Aqua Tower, Chicago

Louvres *continued*



Wood louvres



Louvres, Biola University, La Miranda, CA



Louvres, Bayside Business Park, Queensland, Australia.



Louvres on renovated office building, by Glasscom.