

BIRD-SAFE DESIGN RECOMMENDATIONS – CHICAGO SKYSCRAPER

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INTRODUCTION

Bird-safe design practices and materials should be incorporated throughout the structure, from street level to the spire's top, to avoid the creation of an environmental hazard for birds.

EXECUTIVE SUMMARY

Birds do not recognize that reflections are false and that glass is a barrier. As a result, if something on or behind the glass is an attraction, birds will fly into the glass. Typical attractants are reflections of the sky, clouds or other buildings, green plants in lobbies, and lights.

Because of its critical location on the shorelines of Lake Michigan and the Chicago River, the building will be in the path of tens of millions of birds that travel through the area during migration.

Extensive scientific research has determined that birds *stop* flying toward an attractant when the visible opening is smaller than two inches high or four inches wide. Consider that birds have evolved to negotiate small spaces in trees; they need no larger spaces when traveling in the built environment and, thus, will attempt to fly through very small openings that are presented in windows or reflections.

The architect's goal is to create sufficient "visual noise" to induce birds to avoid the building.

Architectural practices have been established that incorporate the research findings such that the impact on the structure's design and materials is not readily identifiable by the public. Even in very high-profile, well-covered projects, the bird-safe aspect has only merited one sentence in professional publications.

Without a proactive stance, however, the building is likely to be the source of significant bird kills and ensuing negative consequences.

REPORT

Birds are a critical part of the earth's ecosystem. They play a vital role in agricultural pollination and pest control (and no doubt make other contributions we have yet to appreciate). Man has greatly reduced their habitat (by turning the vast prairies into farmland and then farmland into housing developments, for example) and increased the hazards to be traversed.

Building and window glass is now considered the most significant of these hazards.

There is no (financially feasible) way to scientifically count the number of birds killed flying into glass. Each expert who has tried comes up with a number larger than the last. One way to approach the enormity of the problem is to consider that if each person in North America is responsible for the death of just one bird per month –a number that would be considered trivial- the total dead is four billion per year.

Biologists have complained about the bird strikes at buildings for at least a century and carried out serious research for over thirty years. The findings are consistent and simple:

- Birds treat reflections as authentic. The reflected clouds floating by on the side of a skyscraper appear real to birds. Likewise, the reflection of a neighboring building or skyline must be seen as an indication that the birds should fly over the reflection (and into the glass).
- Birds live in our world. They see in hazy conditions and thus, even minimal reflections are real to them.
- Clear glass is not recognized as a barrier.
- The smallest birds will attempt to fly through any opening they can see that is larger than two inches tall or four inches wide. We refer to this as the 'handprint rule' as a handy reminder of the approximate size.
- Tints that reduce reflection or see-through capability will reduce bird strikes. There are no colors that are more or less significant.
- Downward angled windows –40 degrees is optimal– deter birds.
- Lights hold a special attraction and, in the built environment, cause birds to end up in areas they would not normally be drawn to. It takes only one light to be an attraction.
- Beacon lights 'trap' birds and appear to cause death through exhaustion.
- There are no patterns or designs that are more or less useful in deterring birds. Researchers tend to use stripes or dots, which have been construed to be significant; they are not. Additionally, the popular use of bird outlines (e.g., hawks) is a testament to the power of urban legends, not science.

Bird-safe design practices and materials are evolving and expanding as design professionals talk publicly about their bird-safe work. It bears repeating that properly-done bird-safe work is not noticeable to humans and, thus, we don't know all of the tips and techniques of the design trade that are secreted away.

This list should be considered a starting point.

1. UV-A Glass: Biologists have long believed that manufacturers could use the ability of birds to see into the UV-A range (which humans do not see) to create a deterrent pattern in glass (or window film) that would not impact human uses.

ORNILUX® 'bird protection' glass has been announced by ISOLAR-Glas-Beratung GmbH (www.isolar.de). Minimal technical details are available about this product; US researchers specifically do not know how birds react to reflections in the glass.

NYC architect Daniel Piselli (FxFowle Architects) has procured a sample and reports: The sample is an insulated glass unit consisting of a layer of laminated glass toward the exterior side and a single piece of glass on the interior side. The stripes are sandwiched in the laminated interlayer, alternating between 2" darker bands and 1" lighter bands. The stripes are transparent, but they are readily apparent.

2. Fritted Glass: Traditional patterned or fritted glass products are excellent for blocking the see-through aspect of glass but not the reflection.

Bird-safe fritted glass must have the pattern applied on the *external* layer to deter reflections.

3. Film: Printed film can be used to mimic the characteristic of fritted glass. Regardless of its application inside or outside, the installation should be tested to ensure that the pattern 'absorbs' reflections. (This is very situational depending upon the pattern used and the site circumstance.)

4. External Window Coverings: Any and every functional or decorative option should be considered, including blinds, shades, screens, latticework, tubing, vivid pane dividers, grills and art work.

5. Interior options depend upon the specific need:

For obstructing the views through a building (i.e., in one window and out another), the solutions can be applied at one end of the facility or piece-meal across the field of view. The test is what birds see from the outside. Thus, any combination of furniture, artwork, banners and window coverings can be placed to create a visual block.

Using interior pieces to block an exterior reflection is more challenging. In general the solutions must have a very busy pattern and be installed immediately inside the glass. (Both drapes and blinds, with brightly colored patterns, have been used this way.)

CONCLUSION

Bird-safe design practices are considered by knowledgeable architects to be "just another item" on their long list of factors for a project. Generally it simply requires creative thinking and expanded materials selection to make the structure unattractive to birds.

RECOMMENDATIONS

Review these websites which have many photo examples used by designers:

www.birdsandbuildings.org

www.flap.org

www.windowcollisions.info.

Cladding specifications should reflect bird-safe glass.

The documentation for the project should identify those actions taken for bird safety for LEED and/or Chicago Green Permit innovation points.