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A104, A104.10 (New), A104.10.1 (New), A104.10.2 (New)

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Revise as follows:

TABLE A104
SITE PROJECT ELECTIVES

		MINIMUM NUMBER OF ELECTIVES REQUIRED AND ELECTIVES SELECTED
A102.2	The jurisdiction shall indicate a number between and including 0 and up to and including 6 to establish the minimum total number of project electives that must be satisfied.	—
A104.1.1 A101.1.2 A101.1.3	Flood hazard area preservation Flood hazard area minimization Flood hazard area, existing building	□Yes □No
A104.2	Wildlife corridor	□Yes □No
A104.3	Infill site	□Yes □No
A104.4	Brownfield site	□Yes □No
A104.5	Site restoration	□Yes □No
A104.6	Mixed use development	□Yes □No
A104.7	Changing and shower facilities	□Yes □No
A104.8	Long-term bicycle parking and storage	□Yes □No
A104.9 A104.9.1 A104.9.2 A104.9.3 A104.9.	Heat island Site hardscape project elective 1 Site hardscape project elective 2 Site hardscape project elective 3 Roof covering project elective	□Yes □No
A104.10	Bird collision deterrence	□Yes □No

Add new text as follows:

A104.10 Bird Collision Deterrence. Where projects are intended to qualify for a bird collision deterrence project elective, exterior wall materials shall be selected so that the total building bird collision threat rating shall not exceed 15.The total bird collision threat rating for buildings three stories or less

above grade shall be calculated in accordance with equation A-1.For all other buildings the total bird collision threat rating shall be calculated in accordance with equation A-2.

$BCTR_{TB} = BCTR_A$ **(Equation A-1)**

$BCTR_{TB} = [(2 \times BCTR_A) + BCTR_B] / 3$ **(Equation A-2)**

where:

$BCTR_{TB}$ = total building bird collision threat rating
$BCTR_A$ = bird collision threat rating for façade zone A determined in accordance with Section A104.10.1
$BCTR_B$ = bird collision threat rating for façade zone B determined in accordance with Section A104.10.2

TABLE A104.10
BIRD COLLISION THREAT FACTORS

Material Type	Threat Factor
Opaque surfaces that do not transmit light	0
Fiberglass panels	0
Insect screens installed not less than 2 inches from exterior surface of fenestration	0
External horizontal louvers spaced not more than 2 inches on center	0
External vertical louvers spaced not more than 4 inches on center	0
Frit pattern: not less than 1/8-inch thickness horizontal opaque lines spaced not more than 2 inches on center	13
Frit pattern: not less than 1/8-inch thickness horizontal opaque lines spaced not more than 1.5 inches on center	9
Frit pattern: not less than 1/8-inch thickness horizontal opaque lines spaced not more than 4 inches on center	22
Frit pattern: not less than 1/4-inch thickness vertical opaque lines spaced not more than 4 inches on center	13
Frit pattern: not less than 1/8-inch thickness horizontal or vertical opaque lines spaced not more than 1/2" on center	8
Frit pattern: not less than 1/8-inch diameter opaque dot array, not less than 20% coverage	41
Frit pattern: not less than 1/8-inch diameter opaque dot array, not less than 40% coverage	34
Frit pattern: not less than 1/4-inch x 1/4” opaque squares spaced not more than 2 inches on center vertically and horizontally	29
Frit pattern: not less than 3/8-inch x 3/8-inch opaque squares spaced not more than 2 inches on center vertically and horizontally	15
All Other	100

A104.10.1 Façade Zone A. Façade zone A shall consist of the first three stories of above grade exterior wall. The bird collision threat rating for façade zone A shall be a weighted average of the individual threat factors for each material used in this façade zone, as determined in accordance with equation A-3.

$BCTR_A \sum(TF_1 \times WA_1/TA_A) + (TF_2 \times WA_2/TA_A) +$ **(Equation A-3)**

where:

$BCTR_A$ = bird collision threat rating for façade zone A
$TF_{1,2}$ = The threat factor for each material type, as determined in accordance with Table A104.10.
$WA_{1,2}$ = The wall area of each material type.
TA_A = The total above grade wall area for façade zone A.

A104.10.2 Façade Zone B. Façade zone B shall consist of all above grade exterior wall that is not part of façade zone A. The bird collision threat rating for façade zone B shall be a weighted average of the individual threat factors for each material used in this façade zone, determined in accordance with equation A-4.

$BCTR_B = \sum(TF_1 \times WA_1/TA_B) + (TF_2 \times WA_2/TA_B) +$ **(Equation A-4)**

where:

$BCTR_B$ = bird collision threat rating for façade zone B

$TF_{1,2}$ = The threat factor for each material type, as determined in accordance with Table A104.10.

$WA_{1,2}$ = The wall area of each material type.

TA_B = The total above grade wall area for façade zone B.

Reason: Collision with buildings is the single biggest known killer of birds in the United States. Collisions occur in virtually every environment, from urban to rural. The most recent estimate, based on a meta-analysis of data from across the country, is that 635 million birds die each year in collisions with buildings. Biologists consider this to be a significant factor in the decline of populations of wild birds. Birds have intrinsic value but also provide irreplaceable ecological services, including habitat regeneration and pest control.

Research has shown that glass located between ground level and treetops is responsible for most collisions. Glass is invisible to both birds and humans, but humans learn to "see" glass, through a combination of experience and contextual cues. Unfortunately, most birds' first encounter with glass is fatal. They collide at full speed when they try to fly to sky, trees or other objects seen through glass or reflected from its surface. Death from collisions is frequently not instantaneous and may occur as a result of internal hemorrhaging days after impact, far away from the original collision site.

Where humans are usually looking in the direction they're moving, birds must also be alert to possible predators coming from behind, so their eyes are on the sides of their heads. They have limited depth perception and poor contrast sensitivity. Patterns placed on glass to alert birds don't cause birds to understand that glass is there – a single decal to them is something they could fly around. To be perceived as a barrier, patterns must treat entire surfaces and preferably be integral to the glass.

For several years the glass industry has been collaborating with wildlife advocates to introduce "bird friendly" glass options, and to finance research into reducing bird collisions. However, far too many buildings are built without considering these products. Research in the U.S. and Austria has shown that effective visual signals should be based on the body size of small songbirds. Birds are reluctant to fly between vertical lines less than 4" apart. They also avoid flying between horizontal lines less than 2" apart. These dimensions are the basis for recommendations for creating bird-friendly fenestration patterns or screen materials. Common patterns have been tested and are represented, with relative "threat factor" scores, in the proposed table. Testing of proposed solutions started in the early 1990's, using field trials which scored the relative number of birds killed or injured by glass with different treatments placed near feeders, and through aviary trials, where birds were presented with the choice of two flight paths, one invisible clear glass, the other modified by a test pattern. A major testing program developed in Austria in 2003 took the concept of the aviary choice trials and expanded it to what is now called "tunnel testing", incorporating a net so that birds are not injured, using large sample sizes of diverse species and controlling factors such as light intensity. This test is now an official standard for bird-friendly glass evaluation in Austria. (See annotated bibliography, including bird tunnel testing protocols, at http://collisions.abcbirds.org/research.html)

The first tunnel in the U.S. was constructed in Pennsylvania in 2009 and has been used both for research and to provide relative threat ratings for commercial materials, including fritted glass, window films, decals, tapes and coatings. These ratings were used in the development of LEED Pilot Credit #55: Reducing Bird Collisions. Minnesota incorporated a bird-friendly design requirement in their Sustainable Building Guidelines, starting in May 2013. San Francisco adopted Bird-safe Building Standards in 2011 and Oakland followed suit in 2013. In 2009, the Toronto City Council passed a motion making parts of the Toronto Green Standard – which includes bird-friendly design and applies to all new construction in the city – mandatory. As of 2013, building owners in Ontario, Canada are held legally responsible for bird deaths caused by collisions with glass.

Glass is a critically important building material, connecting people in a building to the environment outside while bringing warmth and daylight inside. Using bird-friendly glass in priority applications will enhance sustainable design, benefitting both birds and humans.

Cost Impact: Will increase the cost of construction. Projects choosing this elective may incur additional costs for frit patterns applied to fenestration.

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