

BIRD FRIENDLY DESIGN WORKSHOP

AGENDA ITEM 4

INITIAL EXPRESS TERMS FOR PROPOSED BUILDING STANDARDS OF THE CALIFORNIA BUILDING STANDARDS COMMISSION REGARDING THE 2022 CALIFORNIA GREEN BUILDING STANDARDS, CALIFORNIA CODE OF REGULATIONS, TITLE 24, PART 11

(BSC XX/22)

The State agency shall draft the regulations in plain, straightforward language, avoiding technical terms as much as possible and using a coherent and easily readable style. The agency shall draft the regulation in plain English. A notation shall follow the express terms of each regulation listing the specific statutes authorizing the adoption and listing specific statutes being implemented, interpreted, or made specific (Government Code Section 11346.2(a)(1)).

If using assistive technology, please adjust your settings to recognize underline, strikeout and ellipsis.

LEGEND for EXPRESS TERMS (California only codes - Parts 1, 6, 8, 11, 12)

- Existing California amendments appear upright
- Amended or new California amendments appear underlined
- Repealed California language appears ~~upright and in strikeout~~
- Ellipsis (...) indicate existing text remains unchanged

INITIAL EXPRESS TERMS

ITEM 1

Chapter 2 Definitions

SECTION 202 DEFINITIONS

2 X 2 RULE: Visual markers are most effective collision deterrents if spaced no more than 2 inches (5.1 cm) apart, a distance most birds cannot fly through.

ADHESIVE MARKER: Individual marker applied to the first surface of glass (surface 1) in a pattern or as a custom decal.

FILM: A material adhered to the first surface of glass, (surface 1), perforated or printed with patterns as visual markers.

GLASS, ACID ETCHED: Glass with hydrofluoric acid washed across the entire first surface, (surface 1), which can result in a variety of patterns as visual markers.

GLASS, FRITTED: Glass manufactured with ceramic-based paint applied in various patterns as visual markers.

GLASS SURFACE: The exterior is the first surface, (surface 1), where visual markers are usually applied, with subsequent interior surfaces numbered in ascending order.

MATURE TREE CANOPY: The top of the mature trees or vegetation typical of a region.

ULTRAVIOLET (UV): Electromagnetic radiation on the first surface of glass, (surface 1), with wavelengths between 300 and 400 nanometers (optimum at 370) visible to birds.

VISUAL MARKER: Usually applied to the first surface of glass, (surface 1), a pattern, solid shape, or treatment visible to birds. If markers are applied on an inside surface, surface 1 should have maximum 15% reflectivity.

SECTION A5.102 DEFINITIONS

A5.102.1 Definitions. (The following terms are defined in Chapter 2)

2 X 2 RULE

ADHESIVE MARKER

FILM

GLASS, ACID ETCHED

GLASS, FRITTED

GLASS SURFACE

MATURE TREE CANOPY

ULTRAVIOLET (UV)

VISUAL MARKER

APPENDIX A5 NONRESIDENTIAL VOLUNTARY MEASURES

SECTION A5.107, BIRD-FRIENDLY DESIGN

A5.107 Bird-friendly building design. Newly constructed buildings, or the alteration of an existing building which includes the replacement of all exterior glazing shall comply with the “bird-friendly” building design elements and features in Sections A5.107.1 through A5.107.3 and the California Energy Code.

A5.107.1 Required elevation treatment. Building elevation treatment shall incorporate bird friendly mitigation strategies. No less than 90 percent of a building elevation, measured from grade to a height of 40 feet (12 m) above grade, or from grade to the height of an adjacent mature tree canopy (whichever is greater), shall incorporate bird friendly mitigation strategies. No less than 60 percent of building elevation, 40 feet (12 m) above grade to the top of the building elevation, shall incorporate bird friendly mitigation strategies.

Strategies to minimize the risk of birds colliding with buildings:

1. Glazing

Glazing with visual markers shall include, but is not limited to, the following:

- a. Etched or fritted glass with patterns of elements on the exterior having minimum dimensions of 1/4" (.64 cm) diameter for dots or 1/8" (.32 cm) width for stripes in a density of 2 inches (5.1 cm) maximum horizontally and vertically (the "2 X 2 Rule");

Note: If the visual markers are on glass surface 2, they can be effective if visible behind an exterior surface with reflectivity of 15% or less.

- b. Interior or exterior glazing film with 2 X 2 visual markers;
- c. Laminated glass with 2 X 2 visual markers, patterned Ultraviolet (UV) coating or use of contrasting patterned UV-absorbing and UV-reflecting films;

Note: Low-e coatings shall be behind the visual markers;

- d. Glass block or channel glass;
- e. Developed glazing technologies, documented to reduce bird strikes, as tested by an independent third party and approved by the authority having jurisdiction; or

2. Slats, Screens, Netting, Louvers

Glazing protected by exterior features that create a visible barrier in front of the glazing, may include, but not be limited to:

- a. Horizontal or vertical slats of 1/8" (.32 cm) minimum face width with minimum 2" (5.1 cm) spacing that obscure 85% of glass when viewed from all feasible angles;
- b. Grilles, screens or 1/8" (.32 cm) dia. welded wire mesh with openings no more than 2" (5.1 cm) maximum horizontally and vertically installed parallel to and no more than 3 1/4 ft. (1 m) from the first surface of glass (glass surface 1);
- c. Netting with 1" (2.5 cm) maximum openings, installed taut at least 6" (15 cm) away from the first surface of glass; or
- d. Sunshades or louvers 9" (22.5 cm) deep vertically spaced a maximum 9" (22.5 cm) or 6" (15 cm) deep horizontally at maximum 6" (15 cm) spacing and parallel or angled to the glass surfaces.

A5.107.2 Special conditions. The following special conditions shall comply with the provisions in Section A5.107.1 (as appropriate)

1. Glass facades adjacent to vegetated roof.
2. Glass railings and guardrails.
3. Transparent corners that extend 5.5 feet (1.68 m) on either side of a building.
4. Glass passageways less than 5.5 feet (1.68 m) wide.

5. Auxiliary glass building such as a glass pavilion or atria exposed to the sky.
6. Auxiliary glass building such as a glass pavilion or atria exposed to a courtyard with a water feature or plants.

A5.107.3 Nighttime conditions. Nighttime lighting at the top of the building, and in the interiors of all areas visible through exterior glazing, including lobby and atria, shall be controlled with time-switch control devices or occupancy sensors complying with the current California Energy Code. The control device shall be programmed so the lights are extinguished from 2 am to dawn.

Exception: Emergency lighting and lighting required for nighttime security.

A5.107.3.1 Systems or operation and maintenance manual. Include written recommendations that lighting is extinguished pursuant to Section A5.107.3 and janitorial services to the building are scheduled between sunrise and sunset.

Notation:

Authority: Health & Safety Code Section 18930.5
Reference: Health & Safety Code Section 18930.5

Initial Statement of Reason:

BSC is proposing to add Section A5.107 Bird-friendly building design and adopt amendments that address “bird-friendly” standards for planning and design of buildings that specifically reduce the negative impact of bird deaths caused by collisions with buildings.

BSC received a petition (March 25, 2019) to include Bird-Friendly Design as a voluntary measure in the 2019 Intervening Code Cycle Rulemaking. The petition: “voluntary bird-friendly building design standards.” The California Building Standards Commission has the authority under Health and Safety Code (HSC) 18930.5 to propose green building standards for non-residential buildings across California. State laws HSC 18941.5, with reference to HSC Section 17958.7, authorize local governments and fire protection districts to adopt local ordinances that make amendments to the building standards of Title 24, which allows for more restrictive local amendments that are reasonably necessary because of local climate, geological, or topographical conditions. California Code of Regulations, Title 24, Part 11, California Green Building Standards Code (CALGreen), Section 101.7.1, provides that local climatic, geological, or topographical conditions include environmental conditions established by the city, county, or city and county.

BSC reviewed and determined that the petition met the criteria for a petition as shown in Title 24, Part 1, California Administrative Code, Article 3, Section 1-315. Thus, BSC has agreed to carry the petition in the 2022 Intervening Code Cycle.

During the 2019 intervening code cycle the bird-friendly design regulations were brought to the GREEN & PEME, AD HOC Code Advisory Committee Meeting March 4, 2020. There were a number of questions brought up, and we were asked to have the regulations reviewed by State Fire Marshal and California Energy Commission. At that time, BSC chose to withdraw the regulations and move forward in the 2022 intervening code cycle.

State Fire Marshal and California Energy Commission reviewed the proposed regulations for conflict with other Title 24 codes. No conflicts found.

The petition sets out to address is the large number of bird deaths caused by collisions with buildings. Many varieties of birds are at risk. In general, it is the smaller species that fly at lower altitudes that are in most danger of collisions in California. Material alternatives to vision glass for the treatment of building areas posing the greatest risk for collision is part of the consideration in bird-friendly design.

BSC proposes to add Section A5.107 and sub-sections A5.107.1, A5.107.2, A5.107.3 with exception, and A5.107.3.1. Bird-friendly building design and subsections, adopt the proposed amendments that address “bird-friendly” standards for planning and design of buildings. The intent of these voluntary standards is to reduce the number of bird deaths caused by collisions with buildings. BSC is proposing concepts and alternative materials to vision glazing and other building features for designers and developers to use when designing buildings to reduce bird collision. Cities such as San Francisco, Oakland, San Jose, Palo Alto, Sunnyvale and Richmond have adopted legislation or guidelines to address bird collisions. Additionally, cities such as New York, Toronto, Chicago and the state of Minnesota have already adopted Bird-Friendly Building Guidelines, some regulatory, some voluntary. The city of Portland Oregon created a guide “Resource guide for bird-friendly Building Design” First edition July, 2012 that followed those of the American Bird Conservancy, and has recently moved forward from guidelines to an administrative rule for bird-friendly building treatments refer to [Portland bird friendly ordinance](#) for codified ordinance . By identifying and incorporating “bird-friendly” strategies for designers and developers, the number of birds killed by collision with buildings will likely be reduced. According to a study by Cornell’s Laboratory of Ornithology which cites work by the American Bird Conservancy shows upwards of 500,000,000 bird deaths by collision in North America alone.

May 2019 Canada adopted a National Standard of Canada for bird-friendly building design (CSA A460:19). CSA A460 covers bird-friendly building design in both new construction and existing buildings intended to reduce bird collisions with buildings.

The petition sets out to address is the sheer number of bird deaths, numbering in the hundreds of millions, caused by collisions with buildings across the nation. Populations at risk are generally small perching birds, or passerines, that utilize various migratory routes from summer breeding grounds to winter feeding areas, and some residents. Also at risk are shorebirds and raptors. All of these birds perform environmental services for humans in controlling insect and rodent populations and in pollinating plants

and spreading seed; and they give many human observers great pleasure to the tune of a \$40 billion bird-watching industry.

What creates the greatest threat to these birds is building glass, which birds and humans alike find invisible. However, birds' poor depth- and contrast perception as well as the speed at which they approach building glass puts them at high risk for collision. Most building collisions occur in morning hours but building lighting can create reflections and disrupt birds' orientations, causing some collisions to occur at night.

Material alternatives to vision glass for the treatment of building areas posing the greatest risk for collision do not need to be prohibitively expensive and can be cost-neutral. Portland, OR, in its bird-friendly guidelines, notes that vision glass is the least energy efficient of façade materials, attributing an operating cost to it that is higher than that of patterned glass. A House of Representatives proposal for bird safe design for federal building (H.R. 919) was opined by a Congressional Budget Office to generate no premium in cost. Portland cites cost studies of a local library and a health center, comparing vision glass to fritted or UV-patterned glass and found increases of .05% and .03%, respectively, in the overall building costs. Independently, this author evaluated building materials for cost, finding that opaque materials like concrete or plaster are about half the cost of glass. Some designers of bird-friendly buildings note that costs are not significant if the features are incorporated early in design; retrofitting elements to shield glass will add cost, but economical options can be found.

Any cost impacts of bird-friendly design are further tempered by findings that lower floors typically are those that pose the most threat to at-risk birds and incorporating specialty features is not necessary over an entire tall building.

2. Statewide significance

Beginning in 2010, local jurisdictions in Toronto and San Francisco proposed ordinances to address this problem. Since then, many other California jurisdictions have done so, including San Jose and Oakland, and there is a good deal of variety in the policies. The United States Green Building Council (USGBC) initiated a pilot credit in its Leadership in Energy and Environmental Design (LEED) green building rating system, which ABC has incorporated into a model ordinance.

Many of the birds addressed by California's various policies utilize the Pacific Flyway to travel from summer breeding grounds to winter feeding areas, flying from as far away as Siberia to South America and back, almost a billion birds of over 350 species. Many of these are waterfowl, managed for hunting and conservation; these ducks, geese and swans face habitat loss and other threats but are not typically at risk by building collisions. It is the smaller species that fly at lower altitudes that are in most danger, and they occur throughout California in migration, with some stopping to breed or winter here, within our communities.

With many species already in decline due to building sprawl and loss of habitat, the direct kills of often-healthy birds from collisions with building glass exacerbates their fragile existence. To paraphrase the Portland guidelines, consistent bird-friendly

building design policy is necessary for "comprehensive urban sustainability strategy" to which a green building code is a major contributor.

History

At the conclusion of the 2007 legislative session, then-Governor Schwarzenegger vetoed three assembly bills of enrolled green building laws, writing "building standards should not be statutory" and recognizing the California Building Standards Commission's (CBSC) public process for the adoption of building regulations. He instructed CBSC to work with authoritative state agencies to develop and adopt green building standards for the 2010 building code cycle.

Subsequent amendments to the Health and Safety Code established CBSC's authority for green building standards absent the authority of other state agencies, but also requiring it [CBSC] coordinate with other agencies' experts in standards' development. The administrative regulations also called for cost analysis and a recommendation for voluntary or mandatory status; and if voluntary, whether the standards should become mandatory over the next several years.

The subject petition for voluntary bird-friendly building design standards relies on this authority and is proposed for non-residential buildings across California that can be adopted by local governments. While it is not intended to become mandatory within 3 years, future mandate is not precluded if the role of buildings in birds' decline becomes more critical.

Governor Newsom's [N-82-20](#) Executive Order pledged to preserve 30% of habitat by 2030 (the 30 x 30 pledge) (which the Biden Administration has since also declared) with the intent of stemming declines in biodiversity. Agencies were tasked with coordinating efforts to ensure that biodiversity is considered in fulfilling their mandates. Biodiversity, of course, includes birds.

Birds' numbers across North America have sharply declined in the last 50 years, according to a study by Cornell University published in 2019. Roughly 600,000,000 birds have perished annually due to climate change, habitat loss and commercial activities like resource extraction and agricultural practices. The American Bird Conservatory (ABC) has estimated that roughly the same number are killed by buildings in the U.S. each year. Since most of the birds cited in Cornell's study to have lost ground are from just 12 families, our common perching birds, and these are the birds killed by buildings, it is reasonable to surmise that the urban habitat and its glass buildings are responsible for much of the overall decline, a blow to biodiversity.

Finally, the purpose of Title 24, as noted by a member of the 2020 Ad Hoc Code Advisory Committee, is to protect the safety of human beings, not animals. Of course, in the early years when buildings collapsed and burned to due to inadequate knowledge and building practices, this was the case. However, since then Title 24 has expanded to include energy consumption and civil rights (access), and CALGreen defines a Green Building as one that minimizes its impact on the environment, the occupants and the community. It puts the environment front and center and recognizes that buildings can

have a negative impact on biodiversity, including birds, that it has the authority to address.

A legislative intervention as requested by the CAC would appear gratuitous given CBSC's authority for green building standards and CALGreens definition of a Green Building. However, CBSC worked with nongovernmental organizations in spring and summer of 2020 to obtain legislative authority, but the pandemic restricted the legislative agenda to a minimum. Lawmakers were unable to assist.

TECHNICAL, THEORETICAL, AND EMPIRICAL STUDY, REPORT, OR SIMILAR DOCUMENTS

Government Code Section 11346.2(b)(3) requires an identification of each technical, theoretical, and empirical study, report, or similar document, if any, upon which the agency relies in proposing the regulation(s).

[California Legislative Information](#), AB 35, AB 888, AB 1058, October 14, 2007

Health and Safety Code Section 18930.5(a), Stats 2013, Chapter 585, Sec. 2 (AB 341, Dickinson)

Sheppard, Christine and Phillips, Glenn, Bird-Friendly Building Design, 2nd Ed. (The Plains; VA.)

American Bird Conservancy [ABC], 2015

Resource Guide for Bird Friendly Building Design, 1st Edition. 2012, Portland, Oregon, Article/446308

Saylor Publications. 2014 Ed.

Follow the Pacific Flyway in California State Parks, California Department of Parks and Recreation, [Pacific Flyway - Water Education Foundation](#), undated article

Bird Migration: Birds of the Pacific Flyway, [Bird Migration: Birds of the Pacific Flyway \(perkypet.com\)](#), undated article

CSA Bird-Friendly Building Design Standard, [CSA Standard – BirdSafe](#)

STATEMENT OF JUSTIFICATION FOR PRESCRIPTIVE STANDARDS

Government Code Section 11346.2(b)(1) requires a statement of the reasons why an agency believes any mandates for specific technologies or equipment or prescriptive standards are required.

The California Building Standards Code has historically been a mix of performance and prescriptive provisions and reference standards. The CALGreen code is no different, and wherever possible, a performance option is included to provide flexibility to the code user.

CONSIDERATION OF REASONABLE ALTERNATIVES

Government Code Section 11346.2(b)(4)(A) requires a description of reasonable alternatives to the regulation and the agency's reasons for rejecting those alternatives. In the case of a regulation that would mandate the use of specific technologies or equipment or prescribe specific action or procedures, the imposition of performance standards shall be considered as an alternate. It is not the intent of this paragraph to require the agency to artificially construct alternatives or describe unreasonable alternatives.

BSC has not identified any reasonable alternatives to these proposed regulations, which do not mandate the use of specific technologies or equipment. This is a voluntary provision intended to provide options to building owners/designers to protect biodiversity and prevent bird collision in buildings of up to 40 feet or more.

REASONABLE ALTERNATIVES THE AGENCY HAS IDENTIFIED THAT WOULD LESSEN ANY ADVERSE IMPACT ON SMALL BUSINESS

Government Code Section 11346.2(b)(4)(B) requires a description of any reasonable alternatives that have been identified or that have otherwise been identified and brought to the attention of the agency that would lessen any adverse impact on small business.

No alternatives were identified to lessen any adverse impact on small businesses. Health and Safety Code Section 18928 mandates the proposed action, which will not result in an adverse impact on small business.

FACTS, EVIDENCE, DOCUMENTS, TESTIMONY, OR OTHER EVIDENCE OF NO SIGNIFICANT ADVERSE IMPACT ON BUSINESS

Government Code Section 11346.2(b)(5)(A) requires the facts, evidence, documents, testimony, or other evidence on which the agency relies to support an initial determination that the action will not have a significant adverse economic impact on business.

BSC reviewed and determined that the petition met the criteria for a petition as shown in Title 24, Part 1, California Administrative Code, Article 3, Section 1-315. Thus, BSC has agreed to carry the petition in the 2022 Intervening Code Cycle.

During the 2019 intervening code cycle the bird-friendly design regulations were brought to the GREEN & PEME, AD HOC Code Advisory Committee Meeting March 4, 2020. There were a number of questions brought up, and we were asked to have the regulations reviewed by State Fire Marshal and California Energy Commission. At that time, BSC chose to withdraw the regulations and move forward in the 2022 intervening code cycle.

CBSC conducted two stakeholder workshops: one on June 7, 2022, and the second one September 9, 2022. These workshops were attended by state agencies, interested parties and stakeholder representatives such as Keish Environmental, San Joaquin Audubon Society, USGBC, CBIA, State Fire Marshal, American Bird Conservancy.

ASSESSMENT OF EFFECT OF REGULATIONS UPON JOBS AND BUSINESS EXPANSION, ELIMINATION OR CREATION

Government Code Sections 11346.3(b)(1) and 11346.5(a)(10)

The California Building Standards Commission has assessed whether and to what extent this proposal will affect the following:

- A. The creation or elimination of jobs within the State of California.**
These regulations will not affect the creation or elimination of jobs within the State of California.
- B. The creation of new businesses or the elimination of existing businesses within the State of California.**
These regulations will not affect the creation or elimination of existing businesses within the State of California.
- C. The expansion of businesses currently doing business within the State of California.**
These regulations will not affect the expansion of businesses currently doing business with the State of California.
- D. The benefits of the regulation to the health and welfare of California residents, worker safety, and the state's environment.**
These regulations will increase the protection of bird species across California. Governor Newsom's [N-82-20](#) Executive Order pledged to preserve 30% of habitat by 2030 (the 30 x 30 pledge) (which the Biden Administration has since also declared) with the intent of stemming declines in biodiversity. Agencies were tasked with coordinating efforts to ensure that biodiversity is considered in fulfilling their mandates. Biodiversity, of course, includes birds.

ESTIMATED COST OF COMPLIANCE, ESTIMATED POTENTIAL BENEFITS, AND RELATED ASSUMPTIONS USED FOR BUILDING STANDARDS

Government Code Section 11346.2(b)(5)(B)(i) states if a proposed regulation is a building standard, the initial statement of reasons shall include the estimated cost of compliance, the estimated potential benefits, and the related assumptions used to determine the estimates.

[State estimated cost of compliance, potential benefits, and related assumptions]

DUPLICATION OR CONFLICTS WITH FEDERAL REGULATIONS

Government Code Section 11346.2(b)(6) requires a department, board, or commission within the Environmental Protection Agency, the Resources Agency, or the Office of the State Fire Marshal to describe its efforts, in connection with a proposed rulemaking action, to avoid unnecessary duplication or conflicts with federal regulations contained in the Code of Federal Regulations addressing the same issues. These agencies may adopt regulations different from these federal regulations upon a finding of one or more of the following justifications: (A) The differing state regulations are authorized by law and/or (B) The cost of differing state regulations is justified by the benefit to human health, public safety, public welfare, or the environment.

These regulations do not duplicate nor conflict with federal regulations.