

## **084000 Storefronts, Curtain Walls, and Windows**

### **Sections Included In This Standard:**

- 1.1 Design
- 1.2 Glazing Systems for Renovations
- 1.3 View Windows and Side Lights
- 1.4 Quality Control
- 1.5 Bird-Friendly Glazing

### **1.1 DESIGN**

- A. Registered Architect or Engineer Required: All new, repair, and replacement window glazing projects shall have plans and specifications prepared by a registered architect or engineer licensed by the State of Florida. The professional consultant shall have a minimum of ten (10) years direct experience in window design.
- B. Design: The designer shall specify current Florida Building Code Product Approval or Miami-Dade Notice of Acceptance (NOA) indicating that the system has been satisfactorily tested for wind design pressures as determined by the project structural engineer. The wind design pressures shall be indicated on the plans according to the Florida Building Code. Window assemblies must have the impact resistance ratings required by code for the intended application.
- C. Design References and Guides: All installations shall comply with following industry standards and guidelines:
  - 1. Florida Building Code
  - 2. American Society of Civil Engineers – Minimum Design Loads for Buildings and Other Structures (ASCE 7-02, or edition referenced by the current edition of the Florida Building Code).
  - 3. University of Florida Design and Construction Standards
  - 4. American Architectural Manufacturers Association (AAMA)
  - 5. GANA Glazing Manual, Glass Association of North America
  - 6. ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA, 19428-2959, [www.astm.org](http://www.astm.org)
    - a. ASTM C1036 – Standard Specification for Flat Glass
    - b. ASTM C1048 - Standard Specification for Heat Treated Glass
    - c. ASTM E2112 – Standard Practice for Installation of Exterior Windows, Doors and Skylights
- D. Frames: Frames shall be factory finished, off-white **or clear anodized** aluminum. Depending on the application, framing systems may be thermally broken or thermally isolated to resist condensation.
  - a) **For renovations the window frames need to match the rest of the building.**
- E. Glazing: All glazing shall be insulated. The preferred glazing is a low emissivity glass. Glazing options may need to be analyzed as a part of energy modeling requirements.
- F. Tinting: Tinting of glazing, if any, is typically gray on the UF campus. Other options must be presented to and approved by the Land Use & Facilities Planning Committee during design. Surface applied window film shall not be used.

- G. All connections and flashing conditions shall be shall detailed (including heads, jambs, sills, corners, terminations, and flashings). Where possible, window assemblies shall bear on integral sub-sill or independent sill pan flashing with end dams. The sill pan flashing shall be sealed to the wall opening substrate. Structural connections through the sill pans shall be avoided if possible. Glazing systems shall be designed and constructed with flashing and internal drainage and weep details to manage water infiltration.
- H. Crime Prevention Through Environmental Design: In keeping with the principals of CPTED, windows are encouraged to overlook exterior spaces near building entries, parking lots, bicycle parking, walkways and areas with high pedestrian use.
- I. Operable Window Openings: For most applications, the selection of fixed glazing is preferred over operable windows.
- J. See section 081000 for information regarding storefront doors.

## **1.2 GLAZING SYSTEMS FOR RENOVATIONS**

- A. Window refurbishment or replacement shall be considered for all significant building renovations, both for performance and esthetic reasons. The new or refurbished windows shall be in character with the building architecture, while still meeting or exceeding the requirements of this section as fully as possible. For historic buildings, the renovation or replacements details shall be reviewed and approved by the Preservation of Historic Buildings and Sites Committee (PHBSC).

## **1.3 VIEW WINDOWS AND SIDE LIGHTS**

- A. View windows in new corridor and stairwell fire/smoke doors shall be vertical style in a fire rated metal frame. The height of the glass shall be 25" clear. The width shall be 6" clear unless Life Safety and Fire Codes require 100 square inches maximum, in which case the width shall be 4" clear. Locate the window frame edge 10" from the door edge (latch side), ~~with bottom edge of the window frame 48" from the floor.~~
- ~~B.~~ In new buildings, or areas of major renovation in existing buildings, view windows in doors shall be vertical style, 25" clear height and 6" clear width unless Life Safety and Fire Codes require 100 square inches maximum, in which case the width shall be 4" clear. Locate the window frame edge 10" from the door edge (latch side), ~~with bottom edge of the window frame 48" from the floor.~~
- C. As a preferred method in all UF facilities, vertical side lights in hollow metal frames, which are integral with the doorframe, shall be utilized where there is a request or need for an entrance view window into an office suite, reception area, or similar public destination point. The height and width of the side lite and horizontal mullions (muntins) shall match that of the building standard.

## **1.4 QUALITY CONTROL**

- A. Pre-Construction Conferences: The University shall coordinate a window or building envelope preconstruction conference for all window installation and replacement projects. Participants should include the University office responsible for administering the project, the University office responsible for maintaining the facility, the Architect/Engineer, Contractor, Window Installation Contractor, Window Manufacturer's representative, and other related trades representatives.

- B. Mock up panel assembly: Depending on the facility, a mock up panel assembly may be required to demonstrate the interfaces of building envelope systems. The project specifications shall indicate the nature of the mock up panel(s). Depending on the complexity of the building envelope systems, it may be necessary to provide schematic details of the mock up panel(s).
- C. Quality Control: The installer shall be certified by the manufacturer and the manufacturer shall certify the installation on completion.
- D. Moisture Intrusion Testing: Depending on the facility, performance testing of installed glazing systems shall be performed to verify that they are installed properly. The project specifications shall indicate the frequency and use of standard field test procedures developed by AAMA and ASTM.
  - 1. AAMA 501 – Voluntary Specification for Field Testing of Windows and Sliding Glass Doors
  - 2. AAMA 502 – Voluntary Specification for Field Testing of Metal Storefronts, Curtain Walls and Sloped Glazing Systems
  - 3. ASTM E1105 – Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors and Curtain Walls by Uniform or Cyclic Static Air Pressure Difference
- E. Building Commissioning: The University may employ an independent consultant to serve as building envelope Commissioning agent. In such cases, the technical specifications should stipulate Commissioning procedures and requirements.

## 1.5 **WARRANTY**

- A. All systems covered in this standard (Storefronts, Curtain walls and Windows) shall have a minimum 10 year material warranty.
- B. The installers of these system shall provide 5 years of labor warranty.

## 1.6 **BIRD-FRIENDLY GLAZING**

- A. Background.

Migration patterns for a variety of birds involve bi-annual flights through North Central Florida. A number of these birds die after colliding with buildings, and many of those impacts stem from the birds' confusion when confronted with reflective or transparent glass and their lack of depth perception.

*Daytime strikes occur because birds cannot perceive images reflected in glass as reflections, and thus will fly into windows that they think are trees or sky. Clear glass also poses a danger as birds have no natural sense designed to perceive clear glass as a solid object. Birds will strike clear glass while attempting to reach habitat and sky seen through corridors, windows positioned opposite each other in a room, ground floor lobbies, glass balconies, or where glass walls meet at corners.*

- City of Toronto Green Development Standard (2007)

## B. Bird-Friendly Strategies.

Designers for the project types listed below under “Application” shall consider the following strategies for creating bird-friendly exteriors – two primary strategies and several secondary strategies:

1. The first primary strategy – particularly for new construction – is to simply reduce the quantity of exterior glazing. This requires skillful and sustainable design in order to not impinge upon other contextual or programmatic goals (e.g., energy efficiency and daylighting).
2. The second primary strategy is to add visual markers to or within exterior glazing that indicate to birds that the glazing is a solid object to be avoided. This may be achieved with patterned, fritted, or etched glass; surface-applied films; dense fenestration patterns; decorative grilles; or combinations of these.

The optimal and preferred solution for exterior glazing on UF buildings – punched windows, storefront, or curtainwall systems – is etching the first internal surface of double-paned insulated glazing (i.e., surface #2 of four).

3. Secondary strategies for “bird-friendly” exterior glazing include techniques that mute or reduce reflections, such as:
  - Angled glass (so reflections are reflected downward)
  - Internal screens/blinds
  - Awnings, overhangs, external sun screens or shades, louvers, and physical grids
4. Collisions are most effectively reduced when un-patterned or un-screened glass is kept to less than 4” vertically and 2” horizontally. Therefore, vertical elements of window patterns should be at least ¼” wide at a maximum spacing of four inches or horizontal elements at least 1/8” wide at a maximum spacing of two inches (2011 Standards for Bird-Safe Buildings, City of San Francisco Planning Dept.).

## C. Application.

1. This guidance and the duty to at least consider strategies that reduce bird impacts with exterior glazing applies to all new construction projects, additions, and projects involving the replacement or rehabilitation of all exterior glazing in an existing building.
2. Application of the above-listed strategies and techniques is particularly important for the first 5-6 stories of a building since bird strikes are most likely to occur within 60’ of the ground.
3. Applied bird-friendly techniques should be site and building-specific, accounting for orientation of the facility, height, surrounding environment, etc. For example, glazing on a building adjacent to a natural area with trees that grow higher than 60’ should include treatment (e.g., etched patterns) to or above the eventual top-of-vegetation height.
4. Particular care must be given to glazing for additions or new buildings within the main campus historic district or projects involving window replacement or rehabilitation for an historic building. Designers must strike a balance between context, compliance with the Secretary of the Interior’s Standards & Guidelines for Treatment of Historic Properties, cost, and the guidance outlined herein.

END OF SECTION