



# ALBUQUERQUE PUBLIC SCHOOLS

Facilities Design & Construction / Maintenance & Operations

## Glazing & Window Standards

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## A. Glass Selection

### 1. Glass Type & Color:

- a) Building Envelope Glass shall consist of industry standard Insulated Glazing Units (IGU's). Unit construction shall consist of 2 types of units identified as Impact Resistant and Industry Standard units:

Impact Resistant Glass shall be utilized in areas subject to high impact exposure. Areas include: ground level glass panels, perimeter doors, other areas accessible from ground

- Ground Level Glass Panels.
- Perimeter Doors & Sidelights.
- Any other areas identified as accessible glass providing a potential entry point into a facility.

Impact resistant glass shall consist of a laminated exterior pane / tempered interior pane.

Non-Impact Resistant Glass shall be utilized in areas less vulnerable to high impact exposure. Areas include glass above ground level, clerestory windows and within area with controlled access such as secure courtyards.

- Above Ground Level Glass Panels.
- Clerestory Windows.
- Within areas under controlled access such as secure courtyards, or other secure ground level locations.

Non-impact resistant glass shall be industry standard tempered / tempered IGU units.

- b) Glass shall be limited to Clear in color.

### 2. Glass Safety Type:

- a) Security films shall be allowable applied to exterior glazing as applicable.
- b) Single pane interior glazing shall be tempered glass, unless otherwise required for unusual safety exposure or security, in which case laminated may be used.
- c) Fire rated glazing (typically single glazed, interior locations): Any fire rated glazing allowable under the currently adopted version of the International Building Code is acceptable.

### 3. Glass Coating:

- a) Low-E Coating shall be placed per industry standard. Typically found on the second surface of the insulated glass units (inner surface of the exterior pane).
- b) Low-E Coating shall meet minimum requirements of PPG Solar Ban 60.

### 4. Glass Size:

- a) Glass panels shall be a maximum of 48" square, (actual glass dimensions).

### 5. Spandrel Glass: Size:

- a) Spandrel glass and other opaque glazing are NOT allowed. If there is a need for an opaque panel within a glazing framing system, it shall be of some other durable, non-breakable material.

## **B. Framing Systems for Glazing**

### **1. Hollow Metal Fixed Window Framing:**

- a) Building Envelope Hollow Metal frames shall be thermally broken as applicable for exterior use.
- b) Interior frames shall be designed so as to have the glass mounted toward the passage side of a frame. Example: classrooms would have the glass offset to the hallway so as to mount blinds for interior of classroom operation.

### **2. Aluminum Storefront Framing:**

- a) Building Envelope Aluminum Storefront Glazing shall be thermally broken. Acceptable manufacturers and series are as follows:
  - Kawneer - 451-T.
  - Vista Wall 3000 Thermal Multiplane.
  - Tubelite T14000
- b) Frame colors shall be factory finishes. Clear Anodized Aluminum is the preferred option, however alternate colors finishes are allowable as approved in writing by FD+C.

Coordinate to the APS standard specifications section for “Aluminum Framed Entrance and Storefront” systems for additional standards and guidelines.

### **3. Aluminum Curtain Wall Systems:**

- a) Curtain Wall systems shall be allowable when storefront systems are not appropriate for energy efficiency or structural reasons. Curtain Wall is not intended to replace traditional windows or systems where storefront glazing is deemed appropriate.
  - Curtain Wall systems shall operate similar to a storefront system in that they must provide removal of independent panes of glass without disassembly of multiple sections of the system frame.

### **4. Glass Installation:**

- a) Installation and maintenance of glazing to be determined by application. May vary dependent on specific design considerations.
  - Ground level glazing shall be installed from the exterior side.
  - Upper level windows will vary dependent on access. Windows accessible from the exterior side shall be installed as such. Windows with no accessibility from the exterior side shall be installed and replaceable from the interior of the building.
  - Multi-Story glazing systems shall be accessible from the exterior side when providing a lift for replacement.

## **C. Operable Windows**

### **1. Window Frame Materials:**

Operable windows shall be one of the following thermally-broken, aluminum systems:

- a) Kawneer - Isolock or Isoweb, thermally broken
- b) VistaWall - “Merit”, thermally broken.
- c) Tubelite – VW3700, thermally broken.

\* Specialty windows shall be allowed only by written authorization from FD+C as applicable to match existing conditions (i.e. Historic Buildings) or as applicable for specific design implications.

## 2. Operation Types:

The following types of window operation will be allowed when the conditions listed for each are met:

- a) Casement / Awning / Hopper: These are the preferred operable glazing types, however attention shall be paid to protection of pedestrian traffic by means of design elements (wing walls, landscaping, deep window sills, etc.)
  - Limiting stops shall be provided for wind load, pedestrian protection and opening limitation as applicable.
  - Interior operation is preferred where pedestrian walkways abut windows.
  - Outward operation is preferred at upper level windows and at non-sidewalk locations or locations buffered by design elements providing pedestrians protection from walking into windows.
  - Cranks: Double Arms or Double Arm Cranks are not allowable.
  - Shock, String & Band Balances: Are NOT allowable.
- b) Horizontal Sliding: Generally acceptable, but no preferred.
- c) Single Hung or Double Hung: Are NOT allowable, except in historic buildings with special permission from both FD&C and M&O.

## 3. Insect Screening:

- a) Insect screening shall be provided on all operable windows. Screening frames shall be mill finish aluminum. Fiberglass frames are not allowable.
- b) Screening at exterior to be secured with tamper-resistant screws.

## 4. Upper Floor Window Locations / Size:

- a) Upper level operable windows shall be carefully evaluated for safety and security. Operable windows located above the ground floor shall control the ability to squeeze a body through and opening, control objects being dropped or thrown out windows, or other hazards generated by operable windows at upper floor levels.

## **D. Clerestory & Light Monitor Glazing Selection:**

1. Vertical glazing in clerestory and light monitors
  - a) Storefront Glazing Systems with insulated glass panels.
  - b) Opaque panel systems such as Insulated Fiberglass Panels (Kalwall or equal) or Cellular Polycarbonate Panels.

## **E. Skylights & Horizontal Window Assemblies:**

1. Domed Skylights:
  - a) Shall be a maximum size of 48" x 48" (measured to outside of frame).

- b) Shall use insulating double domed polycarbonate glazing. Acrylic skylights are not acceptable.

\* The use of domed skylights is highly discouraged. Sloping skylight systems are preferred.

## 2. Sloping Skylights:

- a) Shall consist of Insulated Fiberglass Panels (such as Kalwall or equal).

## **F. Water Test:**

- a) Before final acceptance of any window or glazing system, the Contractor shall be required to perform a water leak test. The test shall consist of applying a steady stream of water over the window using a standard utility hose, in the presence of an FD+C Construction Manager or M&O Representative.

- Field test protocols shall be per AAMA specifications.

## **G. Landscaping:**

- a) Landscaping near any glazed building shall NOT have rocks or cobbles greater than 2" size, unless the rocks are embedded in concrete or gunnite.

## **H. Mirrors:**

1. Thickness: 1/4" minimum.
2. Backing: All mirrors shall be fully tape backed to prevent fragments of falling glass in the event of breakage.
3. Frame: All mirrors shall have a J-metal edge frame at the bottom and clips at the top.

### 4. Locations:

- Elementary Schools: Mirrors shall be placed in a normal manner within the interiors of the toilet & lavatory spaces.
- Middle Schools and High Schools: Mirrors shall be located in hallways adjacent to toilet rooms or in lavatory areas that are open to, and directly visible from, the adjacent main hallway. This requirement is to ensure that mirrors can be monitored against vandalism.

\* Special allowance shall be provided by FD+C based on facility use such as gymnasiums, administration offices, etc.

## **I. Glass Block:**

Glass block masonry is not an allowable material for either exterior or interior construction.