

Historic Atlanta Federal Building Posed Architectural, Structural and Blast Protection Challenges



Project

Tuttle Courthouse Annex, adjacent to the Elbert P. Tuttle US Court of Appeals Building, 96 Poplar Street at Fairlie Street, Atlanta, GA 30343.

Project Description

This historic window replication project involved replacing 328 original wood double hung windows with fixed aluminum replication windows manufactured by Wino Window Company, St. Louis.

Built in 1920, The Tuttle Annex is a five-story timber frame building with red triple-brick walls.

The exterior of this historic building was intended to be a model of successful preservation and rehabilitation. The project, still under construction in late 2010, aspires to LEED silver certification by the United States Green Building Council (USGBC).





Problems, Issues, Obstacles



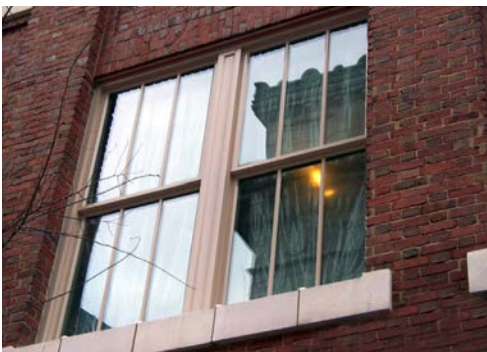
Before

Meeting modern thermal performance, GSA blast mitigation and local historical requirements posed a unique design and fabrication challenge. The new fixed heavy commercial windows had to closely emulate the sightlines, meeting rail, muntin, and sloped putty aesthetics of the original wood double hung windows.

The original 4-inch-wide vertical wood mullion had to be painstakingly replicated in three dimensions to meet Atlanta historical building requirements. At the same time, the new window mullion would substitute wood with a custom extruded tubular aluminum profile which caps a special insulating system inside.

Finally, all new windows had to be securely anchored to the existing walls, including some requiring fiberglass epoxy anchor fortification to handle the heavier load.

The Solution



After

The windows to be replaced were, for the most part, on three sides of the building. One building section was made of concrete with veneer perimeter of terra cotta clay tile block. The general contractor, BECK Group, Atlanta, added a steel grid, connected from slab to slab, to anchor these windows. Two other sections are of timber-frame construction with triple-brick perimeter wall. There, the windows were anchored into

the brick with a Fiber Reinforced Polymer (FRP) wrap on the inside - using resin and the fiberglass matt fabric to strengthen the joints.

There was a steel angle attached to the existing masonry in three-fourths of the building.

Wino provided custom versions of its 1450 series windows, with the typical window size: 3' 7" x 8' 3"

The bulk of the job consisted of twin openings for the Fairlie Street side of the building. All replacement windows are fixed and made to simulate the original wood double hungs, including brick mold and sightlines.

At what was the meeting rail of the original double hungs, an aluminum extrusion was added with a Novard adhesive to simulate the rail and provide horizontal reinforcement.

Exterior applied muntins simulated the original windows' true divided lites. And a custom 4-inch-wide vertical mullion separated the twins.

The three-dimensional vertical mullion cover that Winco developed especially for this project provided historical design authenticity as well as improved thermal and blast resistance characteristics.

Planning and Execution

The Beck Group oversaw the manufacture of the windows at Winco Window Company's St. Louis plant. Planning meetings, held at Beck's corporate offices in Atlanta and at Winco, were overseen by Jared Rice, Beck senior project manager, Wino rep William

G. Martin, Jr. (CJA Martin Consultants) attended for the window manufacturer, and Lynn Ballard for the project glazing contractor, Southern Sash, Atlanta.

The windows were manufactured over four months. Installation by Southern Sash was completed in 2010.

The project manager for Winco was Kurtis Suellentrop. Rob Wanderman represented Atlanta-based Lord Aeck Sargent on the architectural design segment for the Beck Group. Ronald Stang represented GSA for the design-build firm, Stevens & Wilkinson Stang & Newdow, Inc., Atlanta. Jerry Collinsworth provided the blast design and calculations for ABS Consulting and the Beck Group.

Summary of Benefits

- Custom modified Winco Series 1450 historic aluminum fixed windows filled 207 openings with 328 engineered units that met GSA blast protection requirements and architectural replication standards
- Fiberglass epoxy reinforced the structures walls to handle the blast loads.
- Aesthetic details include exterior applied aluminum muntins that emulate the original wood windows' true divided lites with sloped putty glazing for historical architectural accuracy
- Horizontal aluminum extrusion simulates a double hung window meeting rail as well as provide structural reinforcement
- Custom 4-inch-wide aluminum vertical mullion provides 3-dimensional authenticity and cleverly conceals thermal PVC shims that help prevent the cold from penetrating from the outside in
- Pour-and-debridge Azo-brader thermal break system assures minimal heat loss through aluminum frame
- Aluminum spacer adds structural strength to the IG glazing system
- High-performance PPG SolarBan 60 soft-coat IG glazing with protective interlayer
- Energy efficient: 0.45 BTU/IF+2°F*HrU-value unit rating
- Low-e UV fading protection for interior room furnishings, carpet, artwork
- Improved acoustical performance through high performance G window system
- Meets GSA blast protection requirement
- Custom designed thermally improved mullion helps transfer blast load



Cutaway view of sash, frame and glazing system found in the 1450 Series fixed windows installed on the Tuttle Courthouse Annex.

