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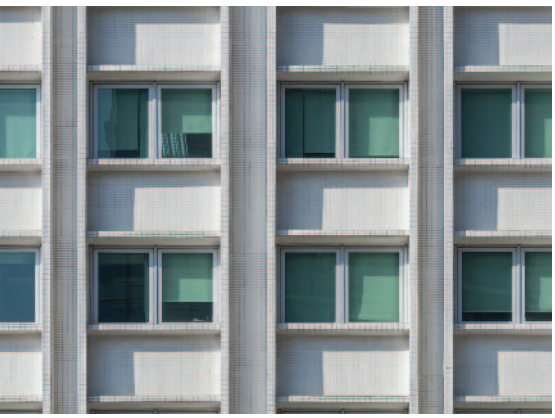
The Ins and Outs of Window Replacement

At some point in the life of your building, the windows will have to be replaced. Moving parts will wear out, materials will deteriorate, and technological improvements will render them obsolete. Before a window replacement project is considered, have the condominium by-laws reviewed to determine who owns what.

We have seen cases were windows, caulking, and flashings have been classified as a combination of common, limited common, and privately owned elements within the same window opening.

There is much to consider when selecting replacement windows but nothing is more important than performance. A major consideration is the design pressure (DP), as it represents the maximum wind load that a window can undergo without sustaining structural damage (e.g. breaking, deforming, etc.). The design pressure an engineer specifies for your windows is dependent on many factors. Building type (e.g. hospital, office building, school, etc.) and geographic circumstances (coastal region vs. inland) play a major role. Washington, D.C., and the metropolitan area is located in a 90 mph wind design region according to the current Building Code. The nearby Atlantic coastline is in a 120 mph zone due to the potential for hurricanes. Proper design also requires a greater DP value for windows the higher they are above the ground, as well as if they are near building corners where increased pressures from swirling winds come into play.



Washington, D.C., and the metropolitan area is located in a 90 mph wind design region!

Another window rating is the Performance Class (PC), as certified by the American Architectural Manufacturers Association (AAMA). Performance Class designates the resistance of a window to water infiltration, air infiltration, ease of operation, resistance to forced entry, etc. and incorporates Design Pressure. AAMA classifications range from "R" at the low end of the scale to "AW" at the high end.

Specifying windows is a complex undertaking, best left to professionals. That being said, if you embark on a replacement project directly with a contractor, there a few things to look out for.

- It's not enough for a window to carry a Performance Class designation. It should be AAMA-Certified, which indicates that the manufacturer submitted samples from that year's production for testing by AAMA. A Performance Class rating could have been granted years ago for a given model, but that does not preclude the manufacturer from changing materials, processes, or other factors over time that could reduce quality while maintaining the rating.
- The AAMA ratings don't incorporate thermal performance criteria. Even the best windows have relatively poor thermal resistance characteristics, but some things can help. Low-emissivity (Low-E) coatings help reflect heat and save energy. Modern windows are dual and even triple-glazed and the air trapped in the inter-pane cavities provide some thermal resistance. Charging those cavities with an inert gas (such as argon) enhances thermal resistance. Argon is denser than atmospheric air, so convective heat transfer is reduced.
- Windows are available in a variety of materials (wood, aluminum, steel, vinyl, fiberglass, etc.) and each has its place in construction; however, some are better suited to certain applications.
- Window installation methods can vary depending on whether it is a new or existing building. Replacement windows can be installed while leaving the old frames in place, which can be economical, but will reduce the effective window opening. Flashings and sealing of the window assemblies are also critical elements that must be designed and installed properly to ensure that the new windows do not leak.
- Finally in-place testing of windows by an accredited laboratory is recommended to ensure that the new assembly and its installation will yield a leak free system.

The two most frequent comments that we receive after a window replacement project are that the new windows significantly reduce the outside noise and improve the energy efficiency of the building. This short article is by no means is an exhaustive discussion of window replacement. It should provide some awareness of the design criteria and insights into the intricacies that can be involved with a "simple" window replacement project.