

Windows at Willamette Towers

This coming summer of 2008, it is anticipated that the building will be re-sealed (seals, on the exterior, are around the aluminum window frames and around the aggregate panels and around vents) and the exterior painted. It is at this time that there will be staging at the building. In the past, this has been staging suspended from the eaves, not scaffolding built from the ground. Perhaps this staging could facilitate the ideal method to make changes at the windows, and so this letter and invitation to discussion.

If you want to start off with a good online article about windows and energy performance:

http://www.umass.edu/bmatwt/publications/articles/windows_understanding_energy_efficient_performance.html

I believe it was in 2006 that a man from EWEB spoke about the windows at Willamette Towers. He said that EWEB offered no assistance or credit for converting the single-pane windows to Insulated Glass Units (IGU's). He explained that there is an insignificant gain in R-Value (insulation value) should the single-pane windows be converted to Insulated Glass Units (IGU's).

I offer the following, which I copied from somewhere, and I regret that I don't know where:

Thermal comfort is determined by air temperature, relative humidity, air movement, mean radiant temperature, the presence of direct solar radiation or insulation, and occupants' clothing and activity levels.

When cold, how low the glass temperature drops depends on the window's insulating quality. People exposed to the cold surface can experience significant radiant heat loss to the cold surface and feel uncomfortable, even if the room air temperature is comfortable. The closer to another window, the more uncomfortable one is, and the uneven heat loss is called radiant asymmetry.

Drafts near windows caused by convective loop are another major source of winter discomfort. Many people mistakenly attribute draft to leaky windows when in fact they are the result of cold air patterns initiated by cold window surfaces. The internal loop of cooling air feels drafty and accelerates heat loss.

A problem common in many units is condensation on both the glass and the aluminum that makes up the frames for the glass at Willamette Towers. In some units, this is quite severe. Insulated Glass Units should eliminate condensation on the glass.

There is one unit at Willamette Towers where recently the single pane glass was replaced completely with IGU's, the industry standard Low-E insulated glass. Condensation problems were alleviated. They report:

“Out of the 23, two have had a small amount of moisture in the middle. The owner of *Abee* (the contractor *Abee Window Screens and Glass*) has been out to check them and has not decided if he should replace those two. The other 21 windows have not had moisture on the glass. The frames still pick up moisture, but it is less than before replacing the glass. The company was easy to work with and each room took one whole day with two workers.”

Except for the first floor and the penthouse windows that rise to a peak in the center, most units have similar sizes of rectangular windows. My unit has full-size panels, operable panels with similar sized glass above and below, and another size where the windows share the wall with (best seen from outside) a stone aggregate panel. I have one other full size panel at a corner that is slightly smaller than the standard.

Last year we needed to replace a full-size panel that, mysteriously, became cracked. We had *Abee* make the repair with an Insulated Glass Unit, and the cost was \$549. The residents who had all their glass converted report the following cost per unit:

Full-size panel	\$529	
Operable panel	\$328	
Small windows	\$320	These are above and below the operable window.

Prices may well go up. The cost of glass is affected by energy and transportation costs.

I remember viewing three samples for glass from *Abee*. I believe they were Cardinal Glass, Solarban from PPG, and Starphire from PPG, which is a clear glass, less green than typical window glass. See the chart at the end of this report to understand terminology.

The Cardinal Glass site gives a nice rundown on their various options and which type of glass is best:

<http://www.cardinalcorp.com/products/products.htm>

The aluminum stops on the existing windows are about 1” deep. *Abee* installed 1/2” glass units, two pieces of 1/8” glass with a 1/4” space in between. *Abee* had new aluminum stops that fit into the existing frames, but were only 1/2” deep, to make space for the new 1/2” windows.

Even if all the windows are changed, there may still be condensation problems from the existing aluminum. A resident looked into new Pella windows set in a frame of dove grey vinyl (Pella’s recommended match for a color to match the aluminum). I believe the cost was \$8000 for new frames with glass, but they required the resident to find a contractor to remove (demolish) the existing panels. There was difficulty finding anyone to do this work. They went ahead with

changing out just the glass.

Perhaps the by-laws prohibit removal of one's window frames. I'm not sure this question has been fully investigated. Ken Guzowski, a resident and the city's Historic Architect (not sure of Ken's exact title) has spoken about the importance of retaining the existing framing. Though one hears that aluminum windows are not available, a local architect, Jerry Pike, recently ordered milled aluminum windows from Kawneer, an established firm. Such new frames no doubt have a thermal break that prevents the condensation we often experience with the existing frames.

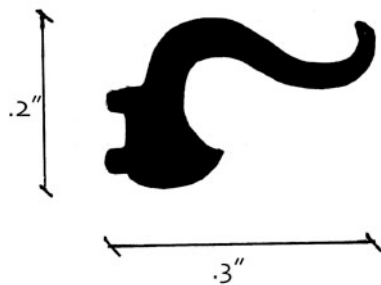
Some units (I don't know how many) have a second pane of glass installed at the interior. This was done a number of years ago, I believe by Eugene Mirror and Glass. I have no reason to recommend this as a solution or upgrade to the existing windows, but I haven't heard that there have been any problems with these.

Another item regarding the windows: The operable fresh-air windows have a rubber seal—a continuous rubber gasket—that eliminates drafts. These become less effective with age. A resident recently had the seals replaced, and reports:

I had Lane County Glass come out and weather strip my windows in Feb 07.

The wind blew in because of loose seal on three of the windows and when that was fixed, you can no longer feel the breeze coming through on a windy day. I thought it made a big difference. My electric bill went down slightly but also about that time had the insulating blinds put in. It cost \$97.00 and the worker from Lane County Glass made several trips out, and wanted to get just the right stripping for these windows. I think with Lane County Glass it depends on who they send out. I am sorry I do not have his name but he had been with them a long time and had some knowledge of the window problems in this building. I guess I would recommend starting with them.

The profile of the rubber gasket looks something like this:



The little knobs on the left slip into a groove in the frame of the window part that opens, and the thick part sort of snaps into the groove. The rest provides the seal. Notice that this rubber gasket is small, about 1/4" x 1/4"+.

Here is some contact information:

Abee Window Screens and Glass
Owner:” Wayne Haney
795 River Avenue
Eugene, OR 97404
689 7286

Lane County Glass
1369 West 6th Avenue #100
Eugene, OR 97402
342 7778
<http://www.lanecountyglass.com>

The Rule of Thumb categories below are from 2003. U-value is a measurement of insulating quality, VT is Visible Transmittance, SHGC is the Solar Heat Gain Coefficient, UV protection has to do with prevention of fading of fabrics and other materials, Spacers have to do with how the Insulated Glass Unit (IGU) is constructed at its perimeter.

Rules of Thumb For Window Selection

	Cold climate ¹	Mixed climate ²	Hot climate
U-value	<0.33 all climates: low U not quite as important in hot climates		
VT	>80%	>50%	>50%
SHGC	>0.55	0.40 - 0.55	<0.40
UV protection	>75%	>75%	>75%
Spacer	warm-edge spacers for all climates		
Frame	non-conductive frames for all climates		
Air Leakage	<0.30 cfm/ft ² for all climates		

That’s my report. Following are some questions I’ve received and my attempts at answers.

Questions and Answers from residents:

I'm sure I'll have sticker shock at a quote, but going to double pane does sound like a good idea. Any idea what sort of energy savings it can make in this old building?

I hope the report is helpful. I can't give a specific answer. Different units in the building may have varying conditions

Are you considering having folks get together to get a combined quote, with the thought that a contractor might charge less on a large job?

I'm not organizing anything like that at this time. It has been suggested that we might have an information session and invite, for instance, Wayne Haney of *Abee* to answer questions. The board will receive this report and I would look to them for the next step. There is a board meeting May 20th and I will attend.

One much smaller thing I may want to do is that I have one pane that is either cracked or scratched, and that may be comparatively reasonable to replace.

You could replace it with single pane glass, or with double-pane glass. Contact *Abee* or another contractor.

A final note: There is a separate issue regarding swelling at interior walls. One spot in our unit has this problem, and it is caused by water leaking through a damaged seal at the exterior. As we move toward having the exterior seals inspected and repaired this summer, I have invited people to report this problem to me so that the contractors can zero in on known problem areas. Let me know if this is also a problem you notice at any of your walls.

Submitted by:

John Rose