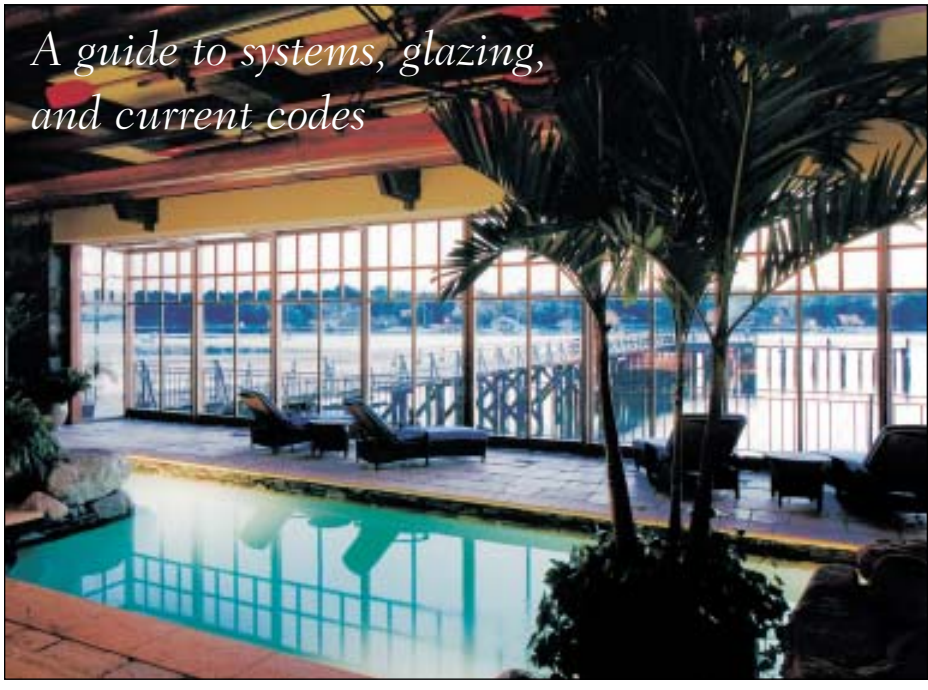
Selecting Sunrooms for Coastal Homes

by Charles Wardell

A guide to systems, glazing, and current codes



Today's sunrooms aren't what they were just a few years ago — there are many more options. You can now get a prefabricated sunroom that will satisfy nearly every design and budget. Even in expensive homes, where several years ago you would have had no choice but to custom-build a structure, chances are good that you can now find a prefabricated structure to fit the bill. But you have to work with the manufacturer to make sure you get what you and your customers want and that the structure performs to everyone's satisfaction for the long run.

The results of such persistent research pay off. At least that's what West Palm Beach, Fla., architect Sam Rosenberg found when he took on the renovation of a 10,000-square-foot home in Manhasset, N.Y. A former seaplane hangar, the home is perched on the edge of a granite seawall, with a tall A-frame roof that faces the ocean and encloses a multi-use great room with a fitness area and swimming pool.

Rosenberg says that his first design called for enclosing the 50-foot-wide by 10-foot-tall opening beneath the A-frame with a custom-built glass and wood-framed wall. But the cost was too high even for this home's wealthy owners. Instead, he found a movable

PHOTOS COURTESY OF ROLL-A-COVER INTERNATIONAL

Even on a high-end project, budget is a deciding factor. The architect saved a lot of money on this Long Island house by using the Roll-A-Cover product on the end of the house facing the ocean rather than custom-building a sunroom. According to the manufacturer, a system like this will cost $90 to $100 per square foot of floor area beneath the horizontal glazing.

sunroom made by Roll-A-Cover International in Bethany, Conn., that had been on the market for three years. This product has 6-foot-wide sections that slide open from the center and stack on top of one another at either end of the opening. Not only did Rosenberg save a lot of money, but he believes the quality of the end product is better than what he could have had built on site. "Because the frame is made from aluminum, it has very little bulk to block the view. You can look out from the fitness room, across the pool, to the ocean view in winter." And in summer, the homeowners can turn the space into an outdoor room. When severe storms blow in from the Atlantic, the stacked sections can be strapped together and the sill bolted down with pegs that fit into sleeves embedded in the concrete deck.

CHOOSING A SYSTEM

New product choices may help explain why sunroom sales have grown so much in recent years. A 2003 *Wall Street Journal* article reported 40% growth in the three prior years. Costs can range from $10,000 for a basic enclosure system upward to $50,000 and above for an elaborate conservatory.

Those numbers don't include glassed-in room additions that are thermally con-

nected to the rest of the house. Such rooms tend to be stick framed and have to meet the same code requirements for structural strength and thermal performance as any other room. Instead, most of the sunrooms counted in the above stats fall under International Residential Code's definition of Patio Covers, defined in Appendix H as rooms "used only for recreational, outdoor living purposes, and not as carports, garages, or habitable rooms." These consist of prefabricated units with aluminum or vinyl frames and insulated glass and foam infill panels.

Sunroom manufacturers compete on design and construction. The biggest design distinction exists between sunrooms and solariums. A *sunroom* has glass walls but an opaque roof, perhaps with skylights. A *solarium* has glass walls and a sloped glass roof. (A third category, the *conservatory*, is a more geometrically complex English-style solarium.) The companies mentioned here will all custom-design and engineer a sunroom for your project, but it's a good idea to ask a lot of questions about each product's limitations. For instance, one manufacturer might use stock-size windows and fill in odd spaces with foam panels, while another might custom-fit sheets of glass and cut them to size.

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Vinyl vs. aluminum. Frames may be made from extruded vinyl or aluminum, and this is where making comparisons may require some due diligence. Impartial information can be very hard to find, and because the sunroom business is extremely competitive, manufacturers routinely savage one another's product. One maker of aluminum sunrooms advises that vinyl won't stand up to high winds, even if reinforced with metal. The people who sell only vinyl systems deny that charge and counter that aluminum is overpriced, will pit and discolor in the salt air, and will conduct enough heat to and from the outside to make the room uncomfortable.

Should you worry about the strength of a vinyl sunroom? It depends on whom you ask. "Although our solariums are aluminum, it's not a structural issue, since vinyl has to meet the same code and wind requirements," says Tony Bouquot, director of engineering with Patio Enclosures, Inc. in Macedonia, Ohio. But others say that there's a point at which vinyl becomes impractical. "It depends on the size of structure. Aluminum can be engineered for larger spans," says Ken Sekley, Patio Enclosures' COO. "It gets to a point where loading up a vinyl structure with steel drives up the cost too much. That makes aluminum more economical for a larger-sized room."

As for aluminum's energy performance, if the room will be heated or cooled, look for a product with thermally broken frames that reduce the heat transfer between the interior and exterior. For instance, the SF-70 model (designed to meet hurricane codes), distributed by

PHOTOS COURTESY OF JOYCE MANUFACTURING

Joyce Manufacturing's Leisure Room 3000 is its top-of-the-line vinyl product, an "all-season" with sliding windows that tilt in for cleaning. The windows use tempered insulated glass with a low-E coating. Approximate cost for the 18-foot by 12-foot room is $19,000.

Phoenix, Ariz.-based Sunflex USA, uses aluminum extrusions whose inner and outer faces are joined with polyamide, a high-tensile, fiberglass-reinforced plastic that limits the conduction of heat.

Aluminum frames are generally protected with a surface coating, often a baked-on enamel. Some manufacturers, such as Sunflex and Roll-A-Cover, use a powder coating on their products. Roll-A-Cover offers a 10-year warranty on its powder-coated finish.

Each manufacturer also has its own menu of options and enhancements. If you want an overhead light, for instance, some frames have built-in raceways for electrical wiring, while others require you to surface-mount conduit. Some companies offer internal roller shades — either motorized or hand operated — that cover the roof and walls of their solarium products, while others put mini-blinds between the panes of glass. Some offer self-cleaning glass (a coating on the glass uses the sun's energy to break down dirt, which then washes off when it rains). Patio Enclosures offers glass with built-in, low-profile safety rails for balcony projects. Berea, Ohio-based Joyce Manufacturing treats the foam insulation in its sunroom wall and roof panels with TCA guard, a mineral designed to repel termites and other wood-boring insects.

UNDERSTANDING GLASS

The glass panels used in a sunroom can range from 5/8-inch single pane to 1-inch-thick insulated glass to laminated glass. There are two issues when it comes to windows: energy performance and impact resistance.

Energy performance. According to Bouquot, the energy requirements for sunrooms are "specific and prescriptive." For instance, the glass used in a sunroom that's thermally isolated from the rest of the house has to have a maximum U-value of 0.5. To meet the energy requirements, manufacturers offer a variety of low-E coatings, which limit radiant heat exchange between panes by reflecting heat back into the home during cold weather and back to the outdoors during warm weather. The type of coating can vary depending on where the window is installed. "We use a stronger low-E coating on the roof glass than on the walls," explains James Ruppel of Four Seasons Sunrooms in Holbrook, N.Y., "because in winter when the sun is lower you want to allow heat gain in." A variety of tints are also used to reduce heat gain as well as ultraviolet rays.

Structural performance. Building

PHOTOS COURTESY OF PATIO ENCLOSURES, INC.

This aluminum-framed, curved-eaves solarium from Patio Enclosures, Inc. was built on an existing roof of a Maryland home for approximately $44,000. This sunroom features insulated Azurlite glass with a slight blue tint that reduces solar heat gain and UV exposure and cuts down the glare for an enhanced view. Roller shades offer privacy and added sun protection.

codes require that safety glass be used for all horizontal glass (glass facing or angled to the sky and the floor) and for windows that are lower than 18 inches from the floor.

Safety glass can be tempered or laminated. Tempered glass is heat-treated to be ten times stronger than untempered glass, and when it does break, it breaks into small pieces without sharp edges. Laminated glass comes with a plastic interlayer. It's the same glass that's used on hurricane-rated windows. Because of its high cost, manufacturers specify laminated only where it's required by code, so if you want to use it elsewhere, you'll have to ask. Roll-A-Cover CEO Michael P. Morris says that his company uses 1/4-inch-thick tempered glass on all vertical walls and a 1/4-inch non-acrylic polycarbonite material on the horizontal portion. (The company guarantees the poly against cracking for 10 years.)

CODE CONCERNS

Better manufacturers have engineering departments that design the room to fit the house and to conform to local codes. As part of this service, they should provide engineering drawings for submission to the authorities.

Some companies offer high-wind products with laminated glass and a glazing system that meets the code-mandated impact and design pressure requirements for hurricane zones. "Look for a manufacturer that has documented engineering for its product," advises Ruppel. "That should include testing for cyclic loads and impact loads."

The engineering should specify how much weather the sunroom can withstand. For instance, Joyce Manufacturing executive vice president Gary Winkler says his company will build sunrooms with wind ratings of up to 140 mph. John Hickey, with Southern Exposure Sunrooms in Wilmington, N.C., installs the Sunflex product, but will also custom-build sunrooms using component parts from various manufacturers. He says he can offer a custom product with laminated glass and an interlocking aluminum frame that stands up to winds in excess of 146 mph and can withstand impacts from a Category 4 hurricane.

Regardless of who installs the sunroom, the builder is responsible for site prep. Getting this right can make or break the project.

Some products have special requirements for storm resistance. Morris says that Roll-A-Cover is manufacturing a 46-foot-deep by 100-foot-long pool enclosure for an 18-story condo project on the ocean in Alabama. He says the room will meet the requirements for a 140-mph wind load. In order to do so, however, the sections have to be opened and strapped down before a storm comes ashore.

INSTALLATION ISSUES

Some manufacturers run their businesses like a standard subcontractor by selling only installed systems, and installation is often done only by franchised companies. Others will let the builder's crew do the installation. If you decide to go this route, ask a lot of questions about the company's training and technical support. For instance, Sekley says that Patio Enclosures will provide the builder with shop drawings, an installation manual and video, and can even send a project manager to supervise the installation.

Regardless of who installs the sunroom, the builder is responsible for site prep. Getting this right can make or break the project. As is true for any panelized structure, the foundation for a sunroom has to be close to perfect. "If

Sunflex installed this folding wall system on a private residence in Connecticut. Cost is about $2,000 for a 3- to 4-foot-wide panel. The system can be custom-manufactured to fit any opening.

PHOTO COURTESY OF SUNFLEX USA

This straight-eaves sunroom from Four Seasons uses northern white pine glulams as a framework for insulated glass panels. The company uses two different glass formulations: The roof glass, which is designed to control heat gains during the summer, has a solar heat gain coefficient (SHGC) of .15 and a U-value of .25. The vertical glass, which allows the warmth of the low winter sun to warm the interior, has an SHGC of .33 and a U-value of .25. Material costs for this model are $18,000 to $20,000. Labor costs vary by region, but run about 40% of total job cost to over 50% in areas with lower labor costs.

PHOTO COURTESY OF FOUR SEASONS SUNROOMS

the area to be enclosed is mismeasured, there's not a lot of flexibility with glass on site," notes Sekley. That's why it's best to order the sunroom after the deck or slab is in place. "The builder has to complete the deck or patio, then take field measurements for each unit before we begin making the order."

Getting things right in the field is even more critical for moving systems. "We ask a lot of questions about site conditions," says Morris. The site needs to be level, plumb, square, and perpendicular to the house. "The measurements have to be almost bone up for the enclosure to work properly, because we can't adjust the wheels." The strip beneath the wheels has to be dead flat. "We've had a few customers who, even after we tell them that we need a flat surface, will install stamped concrete, so there are a lot of caps and grooves." All that's needed, says Morris, is a narrow strip beneath the wheels. Properly installing this strip means that the builder has to heed the manufacturer's specs.

Of course, getting any part of the installation right means that the builder should also be willing to ask any of his own questions. But a builder who has done the research to choose the right system for his project will already understand the importance of leaving nothing to chance. ~

Charles Wardell writes about building science and technology from Vineyard Haven, Mass.

RESOURCES

Champion Windows Manufacturing Inc.
800-875-5575
http://champion.webfeat.net

Creative Sunroom Designs
800-231-7979
www.creativesunroom.com

Four Seasons Sunrooms
631-563-4000
www.fourseasonssunrooms.com

Joyce Manufacturing
800-824-7988
www.joycemfg.com

NanaWall Systems, Inc.
800-873-5673
www.nanawallsystems.com

Patio Enclosures, Inc.
800-480-1966
www.patioenclosuresinc.com

Roll-A-Cover International
866-393-7292
www.rollacover.com

Sunflex USA
602-956-5861
www.sunflexusa.com

Veka, Inc.
800-654-5589
www.vekainc.com