



ORCHARDS AT ORENCO - HILLSBORO, OR

COMMERCIAL WINDOW AND DOOR DESIGNS

PROJECT PROFILE

Windows and Doors Play a Key Role in the Largest Multifamily Passive House Building in the US

REACH Community Development, a Portland affordable housing development and property management company, has worked to provide families in Portland and throughout the Pacific Northwest with safe, attractive, affordable homes. REACH has developed and preserved more than 1,850 units of housing, all of which involved public/private partnerships, often with multiple entities.

In June 2015, REACH completed one of its most ambitious projects to date, Orchards at Orenco, a 3-story, 57-unit, multifamily residential affordable housing complex in suburban Portland that meets Passive House certification standards. Originating in central Europe, Passive House (or *Passivhaus*, as it is known in Europe) is an advanced energy-efficiency standard that produces buildings with superior indoor air quality and thermal comfort while reducing heating energy use. With more than 57,750 ft² (5,365 m²) of space, Orchards at Orenco is the largest multifamily Passive House building in the country.

A project that sets such a high bar for energy efficiency requires unique materials and a careful approach to design. “Our superintendent has a sign up on site that says, ‘The word ‘normally’ will not be used on this project.’ From the way that we constructed the foundation, all the way through our framing and our waterproofing and insulation strategy, everything is different than the typical project,” says Marty Houston, quality director for Walsh Construction Co. in Portland, the project’s general contractor. Some of the most demanding specs were applied to the windows and exterior doors. It is especially important in Passive House projects to find windows and doors that contribute to the building’s exceptional thermal performance and durability. The Orchards at Orenco developers selected System 4700 GENE[®] tilt-turn windows and System 4600 exterior hinged doors designed by REHAU. The uPVC-fiberglass hybrid windows feature argon-filled triple-pane glazing. Their European-style, tilt-turn operation allows the windows to close tighter than the double-hung or slider styles that are more common in the US.

Normally, says Houston, there is a gap in the rough opening between the window and the wall cavity. On the Orchards at Orenco project, those gaps had to be filled. “We actually take rigid exterior insulation and bring it over and on top of the face of the window frame. These frames have a big section of material that you can have the insulation engage with. On lower-performing vinyl windows, you don’t have enough ‘meat’ on the frame to

Project: Orchards at Orenco, Hillsboro, Oregon

Type of Construction: Residential, opened in 2015

Scope of Project: 265 windows, 57 doors

Architect: Ankrom Moisan Architects

General Contractor: Walsh Construction Co.

Manufacturer: EuroLine Windows

REHAU Systems Used: System 4700 GENE[®] tilt-turn window, System 4600 hinged door

get that overlap.” Amanda Asa Lunger of Ankrom Moisan Architects, the Portland-based architect on the project, says another important aspect of the windows and doors is that they were manufactured nearby by EuroLine Windows in British Columbia. It was crucial to find a North American manufacturer to keep the project on schedule and on budget.

The windows and doors proved up to the task according to results of a preliminary air tightness test. A Passive House’s air tightness must be demonstrated with a pressure test (the so called Blower Door test), wherein the allowable air change at a pressure differential of 50 Pascals cannot exceed 0.6 times a room’s volume per hour. A preliminary air tightness test of Orchards at Orenco after the windows and doors were installed recorded 0.056 – more than 10 times the efficiency required! The Orchards at Orenco project passes the original and more stringent European standards for Passive Houses rather than the U.S. standards, which have been relaxed to allow for North America’s more extreme temperatures. “Companies like EuroLine and REHAU are really ushering in the forefront of energy efficiency,” says Dylan Lamar, a certified Passive House consultant from Portland-based Green Hammer, a design/build company that specializes in Passive House construction.

“I appreciate companies like these for being at the forefront of the movement. When I started this game in 2003, there wasn’t a North American manufacturer that could deliver the products we needed. We had to make do with the best products we could find and try to make up for it in other areas.”

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