

# CASE STUDIES

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## HUD Section 202 Housing: ALDES Continuous Ventilation in Senior Apartments

Since 1972 thousands of housing units for low-income senior citizens have been built through a HUD-funded program called "Section 202: Supportive Housing for the Elderly." Seattle architect Michael Fancher of Michael Fancher and Associates has designed many successful projects for the program on the West Coast and nationally.

"It's a really interesting program specifically targeted to nonprofit groups that have an affinity for the group they are serving," says Fancher. The nonprofit agency assembles their own construction team and competes



Michael Fancher, Architect, Seattle, WA

for Federal grants. "We're given a certain budget, and after meeting a small list of HUD requirements, we're pretty much free to spend the money the way we want to, as long as we stay within budget."

Michael Fancher and Associates has incorporated ALDES ventilation systems in over twenty HUD-financed senior housing projects in Washington, Oregon, and California. One example is *Evergreen Court*, located north of Seattle in Washington's Snohomish County. This 30-unit complex



Evergreen Court senior housing complex by Senior Services of Snohomish County, WA  
39 units in one 3-story building  
38 units: 560 square feet, 1 bedroom/1 bath  
Manager's unit: 790 square feet, 2 bedroom/1 bath

is owned and operated by Senior Services of Snohomish County, a nonprofit agency that provides a variety of services for local seniors. *Evergreen Court* opened in April 1998 and provides subsidized housing for low-income seniors.

### Continuous Ventilation Improves Air Quality in Energy Efficient Buildings

Michael Fancher and Associates has designed high energy efficiency housing projects since building standards began calling for higher levels of insulation, better windows, and improved sealing techniques. While these energy efficient buildings save energy and avoid uncomfortable drafts, a good mechanical ventilation system is critical to avoid high levels of pollutants in the dwellings. Unless the system is designed to effectively remove polluted air from the dwelling and bring in fresh outside air, problems often develop due to trapped moisture, odors, cigarette smoke, and the chemicals given off by household products and furnishings.

Michael Fancher and his design team have always recognized the need for providing good ventilation in their projects. However, the traditional bathroom exhaust fans normally used for ventilation were noisy and inefficient, making them ineffective at providing good air quality.

"Initially we were using an exhaust fan, either on a timer or a dehumidistat, in conjunction with some way to let air in the buildings, such as a window vent. What we found over time is that these fans were very annoying to residents and were not used properly" says Fancher. So to ensure that the ventilation system would be used, he tried to outwit his clients. "We would go to great lengths to hide the fan controller. We'd even put the timer up above the header in closets."

Many seniors served by HUD 202 housing, perceived a noisy exhaust fan system as money being wasted. "Many of the low income elderly are very dollar conscious, since they live on fixed incomes. They felt that if the fan was running, it was costing them money, so they didn't want it. If they could figure it out, they would disable it, and we wouldn't be any farther along in preventing air quality problems."

An unobtrusive ventilation system was needed that would work quietly in the background.

**The Solution:** A high efficiency ALDES Multi-Port Ventilator designed for remote installation in the attic or crawl space. With the fans located away from the units' occupied spaces, the noise is all but eliminated. The sound level heard by tenants is usu-

ally .5 sones or less – an extremely quiet installation. The system also continuously removes moisture and pollutants, so problems with mold, mildew, and odors are virtually non-existent.

“We looked at the ALDES system, and I took an immediate liking to the basic tenets behind it,” explains Fancher. “It runs all the time, and it’s quiet. The tenants can hardly hear it – and they can’t turn it off.”

### Continuous vs. Intermittent Ventilation

The ALDES ventilation system operates 24 hours a day at the rates specified in ASHRAE Standard 62-1989. This national ventilation standard says that whenever a residence is occupied, people need general ventilation equivalent to the greater of two numbers: .35 air changes per hour or 15 cubic feet per minute (cfm) per person. The number of people is determined by the number of bedrooms + 1.

In most areas of the country, building codes allow ventilation provided by mechanical equipment or operable windows. In general, occupants don’t use operable windows consistently enough to provide good ventilation. Conventional bath fans and range hoods can be used to meet the standard, but often they are noisy and used only sporadically by tenants, which means that residential ventilation is often substandard.

The ASHRAE standard states that effective spot ventilation can be provided by equipment operated continuously or intermittently. It allows the use of a 20 cfm continuous pickup in a bathroom in lieu of a 50 cfm fan that is used intermittently. An ALDES continuous ventilation system in a multi-family project easily meets the need for bathroom spot ventilation and general ventilation for indoor air quality in each unit.

### Engineered Ventilation Made Simple

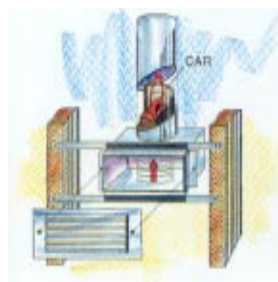
Since *Evergreen Court* is designed with vented range hoods in the kitchen areas, exhaust pickups in bathrooms are sized to meet both general ventilation needs for the units and spot ventilation for the bathrooms. Two ALDES MPV 200/8 fans (Multi-Port Ventilators with 8 exhaust ports) and three MPV 300/8 fans (larger fans with 8 exhaust ports) pull exhaust air from the 39 bathrooms and the community laundry room. All units contain one bathroom, so only one exhaust pickup point is required. Each one-



The laundry room also has a 30 cfm pickup.

Because the ALDES system is a complete engineered system, three-inch vertical ducts connect the wall-mounted exhaust pickups to the fans. Three-inch ducts make installation in a standard 2x4 wall easy. For fire safety, these ducts are made of 26-gauge galvanized steel.

The amount of air exhausted from each pickup point is controlled by an ALDES Constant Air-flow Regulator (CAR), a unique passive flow control device that automatically regulates the air flow from each exhaust pickup in the system. CARs come in multiple sizes to meet a variety of exhaust flow needs. At *Evergreen Court*, a CAR is located in each bathroom exhaust pickup box.



In spite of duct length, outside weather, or position in the building, each exhaust pickup removes the amount of air called for in the system design. Even in multi-story buildings, CARs can be used to meet balancing requirements by maintaining the desired exhaust air flow from each room, without using a balancing contractor. “The mechanical guy plugs the CAR into the hole, and he’s done,” says Fancher. “The whole idea of a **self-adjusting system** is great. It’s dummy proof.”

Washington State’s strict ventilation code requires mechanical ventilation in all new homes. However, Fancher has found that the nonprofit agencies developing senior housing in other states are also interested in providing good ventilation in their projects, even when building codes don’t require it. “Out-of-state clients that we work with have bought into the ALDES system,

and we use it on a very regular basis whenever we can. We believe it’s the best solution for the money. The clients can see the benefit.”

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### ALDES vs. Traditional Ventilation Equipment for Evergreen Court

A traditional bathroom ventilation design would call for:

- 39 bath fans
- 1 standard bath fan in the community laundry room
- 18 vertical attic duct runs
- 18 roof jacks
- 22 horizontal duct runs in the ceiling assembly
- 22 wall caps
- 80 wiring evolutions

The ALDES ventilation system includes:

- 5 Multi-Port Ventilator fans
- 5 gable end discharges
- 5 wiring evolutions

Eliminating roof and wall penetrations **saves time and money** for the contractor, while improving the structure aesthetically. “It’s a big deal to avoid penetrations in outside walls,” says Fancher. “Typically if we put ten units on an ALDES fan, we can get rid of nine vents. Visual improvement is a big thing. We have also run into problems because the code requires a certain distance between a window and a vent that comes out through the wall. In buildings with smaller units, sometimes it becomes a real problem, so being rid of a vent can help.”

The question of the ventilation system energy efficiency was raised since *Evergreen Court*’s construction is designed to save energy. Even with the ALDES system operating 24 hours a day, it is no more expensive to operate than the traditional system. With only 5 fans consuming 120 watts each versus 40 intermittent fans consuming 70+ watts each, there is virtually no energy penalty for continuous fan operation.

Of course, this depends on the proper use of intermittent exhaust fans to achieve proper ventilation rates. Which brings us back to the original problem of poor indoor air quality due to improper use of the ventilation equipment. The best solution for everyone was the quiet, low level continuous exhaust ventilation achieved with the American ALDES system.

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