

PIERCE COUNTY LIBRARY

Tacoma, Washington



Case Study - Pierce County Library Administration Center built in 1992

Client Need- the HVAC system had reached the end of its useful life, and energy usage was too high.

Original Design - Single story building 50,000 square feet - 100+ VAV boxes with electric strip heat Served by two (2) main air handlers with strip heat for morning warm up and DX cooling.

Solutions Considered: basic VAV system, VRF, or the "Aermec Solution"

Option #1- Replacing existing VAV system with "like for like" budget \$550,000

Option #2- Leading Contender- VRF (Variable Refrigerant Flow) Mitsubishi/LG/Samsung or others

Included: 100+ indoor units, outdoor units, required electrical, refrigeration and condensate drain piping, fresh air ducting for code compliance: All three VRF proposals all had similar budget costs, construction schedules, and savings estimates.

Projected schedule9 to 12 months

Budget cost of job..... \$900,000 to \$1,200,000

Projected energy savings \$22,000

Projected energy grant\$0 due to poor ROI

See next page for Aermec solution

Option #3 –Out of the Box Solution - Aermec/VAV proposal utilized the existing HVAC infrastructure: duct chases, power supplies, and equipment foundations. The VAV air handlers were similar to the 20 year old units. The new air handlers could provide heating or cooling via their dual purpose water coils being conditioned by the highly efficient **Aermec Heat Pump Water Heater**.

Projected schedule	5 months
Actual cost of job.....	\$711,000
Measured and Verified energy savings.....	\$24,000 per year
Awarded energy grant of	\$79,000
Return on Aermec Investment	$\$711K - \$550K - \$79K = \$82K / \$24K$3.4 years

Aermec/VAV equipment was easily integrated into the existing building management system

Negative Factors considered regarding VRF Proposals

Implementation would take at least 80% longer than Aermec and would involve tenant disruption, while the Aermec solution was achieved with no loss of productivity.

Proprietary VRF controls can be difficult integrate into existing BMS systems.

VRF lacks OSA management and does not allow energy saving, economizer cooling.

During plan review, energy recovery of the exhaust air was suggested. Typically this is accomplished with a heat exchanger inside the air handler. However the savings with this technology is minimal and comes at the cost of higher internal static pressures and higher fan horsepower (parasitic losses of re-covered energy). A simple alternate solution was to deliver the exhausted energy to the heat pump. This warm exhaust air combines with ambient air to provide a better source of heat to be “pumped” by the Aermec unit, back into the building.