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 schedule ……9 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

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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.

OLYMPIC HIGH SCHOOL

Bremerton, Washington USA

Olympic high school in Bremerton, Washington required a more efficient way of heating the water in their indoor swimming pool.

The Solution

An Aermec air to water NRL heat pump was installed to provide heat to the swimming pool in a highly efficient manner.

LAKE WASHINGTON STEM MIDDLE SCHOOL

Redmond, Washington USA

This new LEED platinum Science, Technology, Engineering and Mathematics ("STEM") middle school is a modular structure whereby the main building elements including HVAC controls, electrical, hydronic and plumbing components were built offsite and trucked 200 miles for onsite assembly and integration. Of note is that the Pacific Northwest is notoriously challenging for heat pump controls. Fog and average winter conditions of 41°F (5°C) with 80% RH make frost control a significant issue for most of the heating season.

The Solution

An Aermec NRL 600 HA was selected as the primary heating and cooling plant in this primarily heating application. Two characteristics of the Aermec design were critical: (i) low temperature heating performance and (ii) superior defrost strategy. The unit was sized to provide the total building heating load down to approximately 35°F. Boilers will provide supplemental heating and backup during the 300 or so hours per year that the outside temperature falls below this level. Summer cooling requirements are low in this coastal marine environment. An Alerton BMS manages the buildings fan coils and individual room thermostats, adjusting supply water temperatures in the 2-pipe system to meet heating and cooling requirements.

THE WESTERLEIGH RETIREMENT RESIDENCE

Vancouver, British Columbia Canada

Situated in West Vancouver, the Westerleigh Retirement Residence is a luxurious retirement facility with breathtaking views, award-winning cuisine and exceptional amenities.

The Solution

This luxury residence required an extremely noise controlled system. Three Aermec NRL700 units in their optimally silent versions were installed providing both chilled and hot water into the building.

ATHLETE'S VILLAGE PAN AM GAMES, 2015

Toronto, Ontario Canada

The Pan American Games is a major international multi-sport event that is scheduled to be held from July 10-26, 2015 in Toronto, Ontario, Canada. Given the number of attendees, the Games had to construct new athlete housing. The housing will later be converted into condominiums.

The Solution

While various systems were considered, Aermec NRL chillers and free cooling chillers were chosen to supply chilled water to the Athlete Village Housing.

NOAA WEATHER SERVICE OFFICE

Caribou, Maine
USA

The National Oceanic and Atmospheric Administration's weather forecast office serves as the primary means of gathering weather data in the northeast region of the United States. The new construction and renovation of the building was completed in 2009 with the aim of being LEED certified. The building was rated Silver (34 points) by the US Green Building Council. It is recognized as a LEED Certified building.

The Solution

Two Aermec 20 ton heat pumps/chillers with low ambient cooling were used and assisted greatly in the building's pursuit of LEED certification. The Aermec units were installed alongside two dry coolers for free cooling.

B.C. HYDRO NORTHERN REGIONAL OPERATIONS

Prince George, British Columbia
Canada

Set to open in early 2014, BC Hydro is building a new regional operations to serve over two-thirds of the provincial land base, including 160,000 business and residential customers in northern BC. The centre is designed to incorporate energy-efficient and conservation measures. The building will meet post-disaster requirements of an Emergency Operation Centre and it will be able to function in the aftermath of a natural disaster. It will house the 200 employees of BC Hydro Prince George operations.

The Solution

Two NRP700E4R2 multipurpose heat pumps have been ordered to provide energy-efficient heating and cooling to this site. Featuring unmatched efficiency, the units offer simultaneous heating & cooling with total heat recovery.

RCMP "E" DIVISION HEADQUARTERS

Vancouver, British Columbia Canada

The RCMP "E" Division Headquarters in Vancouver, British Columbia required an energy-efficient heating and cooling system.

The Solution

Four NRL heat pumps with heat recovery were installed to provide 208 tons of cooling and over 2,000,000 BTU/H of heating when in heating mode. The server room has a load of 100 tons at all times which will provide over 1,200,000 BTU/H of free heating in the winter. The free heat will supply the total building's heating load, resulting in no heating bills.

COOPER MILLS RETAIL MALL

Etobicoke, Ontario Canada

When this retail mall was due for renovation, the engineering firm considered both geothermal and conventional ducted systems.

The Solution

Two 20 ton Aermec heat pumps complete with self contained pumps and storage tanks were installed, and were matched with 21 Aermec high static fan coils complete with digital thermostats. The high efficiency boilers supply second stage heating.

ROBIN RIDGE WINERY

Keremeos, British Columbia
Canada

Located in southern British Columbia, Robin Ridge Winery has been producing wine since 1996. The winery has a restaurant, office area and wine storage area that requires consistent refrigeration for their fine wines. Each space requires different temperatures at all times.

The Solution

Three Aermec AN417HA heat pumps were chosen to provide comfort, cooling, and heating for the restaurant and office space, as well as refrigeration for the wine storage area. The system is configured so that the client may use heating, cooling, and refrigeration at the same time or have the system in any combination of heating, cooling, refrigeration or ice production.

OLD CREDIT BREWING CO. LTD.

Mississauga, Ontario
Canada

The Old Credit Brewery has been brewing ice-brewed beer for over 15 years in Mississauga, Ontario. The brewery uses a sub-zero brewing process that is virtually unheard of in the rest of North America.

The Solution

Three Aermec AN0417A chillers complete with DCPX provide glycol at -6° C were installed to assist with the brewing of ice beer. The units can run 24 hours a day, 7 days a week with no issues, giving the brewery the ability to have the units in heating, cooling, or refrigeration mode or any combination thereof.

NEW AFTON GOLD MINE

Kamloops, British Columbia Canada

New Afton is New Gold Inc.'s primary development project. It is located 10km from Kamloops, British Columbia and is an underground mine which will produce an annual average of 75 million pounds of copper and 80,000 ounces of gold over a 12 year mine life.

The Solution

Two Aermec NRL3000 Free cooling chillers complete with 2 high pressure pumps with internal tanks were selected for this mine.

"GROWN UPS" FILM SET

Essex, Massachusetts USA

Grown Ups was a 2010 American comedy film starring Adam Sandler, Kevin James, Chris Rock, David Spade & Rob Schneider. In a typical film set, portable units are used before shooting to cool down the set, and then completely turned off before shooting to eliminate noise levels. When the temperatures rise again, the shooting stops and the air conditioners are turned on again. Given that filming was done in the spring, the temperatures fluctuated between cold and hot frequently. Therefore, the producers of this film requested a more efficient system to maximize filming time and minimize production costs.

The Solution

Two Aermec 10 ton heat pumps were installed along with 10 Aermec fan coils. Using the Aermec system allowed shooting to continue uninterrupted as the cooling noise levels were inaudible to the cameras. The Aermec system also suited the climate perfectly as the heat pumps switched back and forth from heating to cooling with the weather changes. Aermec's exceptional features allowed filming to proceed uninterrupted, saving an estimated $10,000 per day in production costs.

SURREY MEMORIAL HOSPITAL

Surrey, British Columbia Canada

Surrey Memorial Hospital is the second largest hospital in British Columbia and has the busiest emergency department. As of 2011, SMH provides service to over 93,000 emergency room patients per year.

The Solution

In 2012 AERMEC supplied three NRL3600 chillers with total heat recovery to provide 750 tons of cooling and free/recovered heating all year around.

QUEEN MARGARET PRIVATE SCHOOL

Duncan, British Columbia Canada

The Junior School is a newly constructed LEEDS designated "green" building. The floor plans were designed in conjunction with input from the Vision 2008 Committee. They spent countless hours consulting and visiting other schools to determine what would best suit the needs of Queen Margaret's students. The result is a Junior School that retains many of the comforts of a small school but with additions of larger classrooms and new specialized classrooms which enhance the students learning experience. The 20,000 square foot Junior School is an exciting milestone in the School's evolution.

The Solution

At the end of the renovation project two Aermec AN1517HA were selected along with Aermec fan coils. The system was chosen for its efficiency, extremely low noise levels and its ability to provide year round heating and cooling with back up electric heat.

MODA HOTEL

Vancouver, British Columbia Canada

This prehistoric hotel was built in 1908 and is situated in the heart of the Arts & Entertainment district of downtown Vancouver. The hotel consists of 57 rooms that hold a modern contemporary interior design look and feel. Situated inside the hotel lobby, hotel guests can wine and dine at the Uva Wine Bar and Cibo Trattoria. The hotel required a more efficient heating and cooling system.

The Solution

An Aermec system was the right solution for Moda Hotel because it supported the 15 tons of cooling the building required, used units that were operational as heat pumps when required, and offered individual fan coils with wireless thermostats for each room so that vacant rooms would no longer be heated or cooled unnecessarily.

CRANBERRY RESORT

Collingwood, Ontario Canada

Set against the panoramic backdrop of Blue Mountain and the beautiful waters of Georgian Bay, the Cranberry Resort is a 750 acre year-round vacation destination.

The Solution

The resort required an efficient system that could provide different heating and cooling to various rooms depending on each room's particular uses. An Aermec system met these needs in that it allowed for all suites and meeting rooms to have their own fan coil and thermostat, giving individual tenant temperature control. The system saves energy and is very efficient due to the flexibility to change the temperature in areas and suites that are not in use during the day or evening.

111 PRINCESS AVENUE

Vancouver, British Columbia
Canada

In December of 2014, the Province of British Columbia and the City of Vancouver set out to build new social and supportive housing units to reduce and prevent homelessness. 111 Princess Avenue is one of the new buildings constructed for this purpose, with 130 units of supportive housing.

The Solution

The Province of British Columbia and the City of Vancouver required a highly efficient heating and cooling system and as a result, Aermec's NRL900HA and NRL3600HA were selected to provide both cooling and heating to all 130 units as well as the common areas of this supportive housing residence.

MICROSOFT CANADA HEAD OFFICE

Mississauga, Ontario
Canada

Established in 1985, Microsoft Canada Co. is the Canadian subsidiary of Microsoft Corporation. The Mississauga headquarters oversees ten of Microsoft's regional offices across the country.

The Solution

It is imperative for a data room in support of such extensive operations to remain cool. Two of Aermec's NRL600FA Free Cooling Chillers with integral tank and pumps were ordered to provide Microsoft with energy savings and all year-round cooling to its data centre. The chilled water will be provided for in rack cooling systems.

KACKAAMIN FAMILY DEVELOPMENT CENTRE

Port Alberni, British Columbia Canada

This government subsidized complex situated in British Columbia consists of 6 four-plex units and a main administration center. The complex is designed to provide physical, emotional, mental and spiritual healing to First Nation Families whose lives have been affected by addiction. The agencies were looking for a comfortable, energy efficient and cost effective HVAC system for their new centre.

The Solution

Geothermal heat pumps and air to air heat pumps were considered, along with the Aermec air to water system. The Aermec system was chosen because of comfort, long term operational costs and lower maintenance costs. Individual thermostats were installed in each apartment, as well as in each living room and kitchen.