

Fresh Food and Fresh Ideas!

Stew Leonard's and AAON partner to create customer comfort with an energy efficient design.

In 1969, a seven employee dairy store carrying just eight items was founded in Norwalk, CT - Stew Leonard's. This family owned and operated business has since grown at an amazing pace, including multiple expansions of the original store



Stew Leonard, Sr

and the opening of three additional locations. Stew Leonard's has now become one of the world's most renowned grocery stores with nearly 300 million dollars in annual sales and 2,000 employees. Stew Leonard's is known for having the greatest sales per unit area of any single food store in the United States. The success of Stew Leonard's has been attributed largely to their passionate approach to providing fresh food

items, exceptional customer service and employee satisfaction.

Stew Leonard's now carries about 2,000 items chosen specifically for their freshness, quality and value. Each store consists of one continuous aisle with an open butcher shop, dairy plant, open kitchen, bakery, singing animatronic characters, employees dressed in costumes and food and drink samples spaced throughout the store. Local produce, store roasted coffee beans, freshly baked bread, store processed milk and freshly made cheeses are just a few of the food items available. More than just a grocery store, Stew Leonard's is often referred to as the "The Disney Land of Dairy Stores".



The Leonard Family



Stew Leonard's
FARM FRESH FOODS

Rule 1:
The Customer Is Always Right!

Rule 2:
If The Customer Is Ever Wrong, Reread Rule 1.

The newest Stew Leonard's is 113,000 ft² and is located in Newington, CT. The building, which previously housed a discount department store, was transformed into the most energy efficient Stew Leonard's to date. To minimize the building's utility costs many energy efficient designs were used during the renovation. One of which was the design of the store's heating and cooling system. The utility costs of the system needed to be minimized; however, the comfort of the customers and employees, in the wide variety of environments in the store, could not be sacrificed. The previous Stew Leonard's stores' heating and cooling systems consisted of air-cooled condenser packaged rooftop units.

"For the Newington Stew Leonard's, we wanted to invest in an energy efficient heating and cooling system, that would provided utility cost savings for many years to come, while still keeping the customers comfortable," noted Doug Hempstead, Vice President of Property Development for Stew Leonard's.

The design chosen for the heating and cooling system of the store was an AAON water-source heat pump (WSHP) packaged rooftop unit system, with a cooling tower and boiler condenser water loop.

would also be used for the water-cooled condensers of the store's refrigeration systems. "Water-source heat pump systems are one of the most efficient and environmentally friendly ways to heat and cool a building. Although they are common in Europe and Canada, they are being specified more often in the U.S., especially on buildings that also include refrigeration," stated Chris Wynimko, of Collective Design Associates, LLC, the Specifying Engineer for the Newington Stew Leonard's. Fabric ductwork was specified for the system because it would be quick and easy to install throughout the large store and could be removed for washing, which benefits the store's indoor air quality.

Heat pumps can reverse the flow of the unit's refrigeration circuit, allowing the unit to be able to heat the space with the refrigeration circuit. This is a more efficient method of heating than electric resistance heating because a heat pump can reject more heat to the space per the amount of energy used. Thus, the operating costs of heat pump heating are



Newington Stew Leonard's



Newington Stew Leonard's During Construction

always less than the operating costs of electric resistance heating. Heat pump heating is also a more efficient method of heating than gas heating and, depending on the cost of electricity and natural gas or propane, heat pump heating can have less operating costs than gas heating.

Water-cooled condenser DX units, such as WSHP units, offer better energy efficiency than air-cooled condenser DX units. This is because units with a water-cooled condenser, which is connected to a cooling tower, have lower condensing temperatures during the cooling season, when the condensing temperature approaches the ambient wet bulb temperature. Air-cooled condenser units must operate at the higher ambient dry bulb temperature. This energy efficiency advantage is greatest in dry areas that experience low wet bulb temperatures.

During the heating season, WSHP units can be run in heat pump heating mode at colder ambient temperatures than air-cooled heat pump units, with the inclusion of a boiler in the condenser water loop. Thus, WSHP units do not require back up electric or gas heating like air-cooled heat pump units. The boiler in the store's system keeps the condenser water loop at or above 65°F.

Also, during conditions when both heating and cooling operations are required by the heating and cooling system, or in the case of the Stew Leonard's, the refrigeration systems, a balance of heating and cooling can occur. At this equilibrium point the heat rejected to the water loop by the refrigeration systems and the WSHP units in cooling mode balances the heat rejected to the air by the WSHP units in

heating mode, thus the system can operate without using the cooling tower or boiler. This is a significant advantage over air-cooled heat pump units.

AAON light commercial WSHP rooftop units were selected for the Newington Stew Leonard's. "This was because of the units' exceptional heating and cooling capacities," expressed Wynimko, "and the availability of factory installed energy recovery wheels and humidity control." AAON WSHP rooftop units with AAONAIRE® energy recovery wheels and modulating humidity control are available in over 35 different sizes from 2-230 tons of capacity.

AAONAIRE® Energy Recovery Wheel



The modulating humidity control option from AAON provides a dehumidification mode of operation, which can operate independently from the cooling mode. During dehumidification, the modulating reheat valves divert hot refrigerant gas from the condenser to the reheat coil, allowing the evaporator coil to cool the air stream to

the dew point and the reheat coil to warm the air stream back to room temperature, using the minimum amount of reheat needed. This allows the humidity of the space to be reduced without supply air temperature swings or overcooling of the space.

AAONAIRE factory-installed total energy recovery wheels were specified on the units of the store that bring in the majority of the outside air used for ventilation. Adding a total energy recovery wheel helps reduce the units' energy consumption by pre-heating, pre-cooling, humidifying or dehumidifying the ventilation outside air (depending on the conditions). The wheel is mounted in the outside air intake and exhaust airstreams.

While the wheel spins the exhaust air stream transfers some of its heating (or cooling) capacity to the wheel, which is then transferred from the wheel to the entering outside air stream. Depending on the air conditions, an AAONAIRE energy recovery wheel pre-conditioning the outside air can increase the tonnage of the unit by as much as 30% while at the same time doubling the unit's energy efficiency ratio (EER).



"The Stew Leonard's water-source heat pump rooftop units include some of the most energy efficient factory installed features available for this application from AAON," remarked Lew Cohen, AAON Sales representative with AERCON Corporation.

Since the WSHP units have been installed and running on the Newington Stew Leonard's, the units have been able to control both the temperature and humidity in all the different environments of the store. "The AAON units have been able to keep the store comfortable for the customers without any temperature or humidity problems," said Hempstead.

Stew Leonard's has been extremely pleased with store's low energy usage of the WSHP units, water-cooled condenser refrigeration systems and variable flow condenser water loop. Because of these systems and a few other energy efficient designs, the building is

much more energy efficient than a traditional building. This has led to reduced utility bills and rebates from the state of Connecticut's energy efficiency programs and the Connecticut power company. Thus, with the addition of the AAON water-source heat pump the Newington store is the most energy efficient Stew Leonard's.

Additional features specified on the Stew Leonard's units include factory installed burglar bars on the supply and return air openings, factory installed lint screens upstream of the unit filters, factory installed supply and exhaust fan VFDs and field installed controls by others. The field installed controls by others option allowed Stew Leonard's to use rooftop unit controllers on the units that matched exactly with the rest of the building's controls. Thus, no proprietary controls with external devices or gateways were needed for integration of the unit controls.

For more information about AAON Water-Source Heat Pumps contact your local AAON sales representative at www.aaon.com.



Defining Quality. Building Comfort.