Project

Name
Oak Street Senior Apartments

Location
Flint, Michigan

Completion Date
September 2014

The Team

HVAC Contractor
Warren Systems
Lapeer, Michigan

HVAC Distributor
Shoemaker HVAC Supply
Holland, Michigan

Fujitsu Equipment

(24) ASU9RLS2 Wall Mounts

(15) AOU9RLS2 Condensing Units

(9) AOU9RLS2H Condensing Units

(4) AUU18RLF Compact Cassettes

(2) AOU36RLXFZ Multi-Zone
    Condensing Units

FUJITSU

Halcyon

All Objectives Met

Originally built as a school in 1898, this 3 story, 42,000 ft^2 building sat idle for years until a recent project renovated the building to be used as a Senior Apartment Building for low income residents. Each apartment ranges in size from 500 to 750 ft^2. There are 24 apartments.

Design Challenge

The owners at Oak Street Senior Apartments had a specific list of objectives to be achieved:

- Maintain building's historical look
- Equipment had to be isolated to prevent theft
- Provide a heating and cooling solution without using duct work
- Low operation cost
- Individually meter electric cost per tenant
- System chosen must be the sole source of heat and air conditioning

Solution

Maintain building's historical look and isolate the equipment to prevent theft.

This was achieved by installing the majority of outdoor units up on the roof or indoors, in 3 separate mechanical rooms in the basement. This was achieved with the help of Fujitsu Engineer, Reid Goyert. Reid designed the ventilation system of the mechanical room to exhaust hot air from the space in the summer with a 1,250 CFM ventilation system operated by a thermostat. In the winter a 110,000 BTU/hour unit heater is used. The unit heaters seldom operate as the temperature consistently remains at 60°F.

Compact cassettes were used in the hallways. On a day that temperatures reached -12°F, the corridors of the hallways were 70°F.
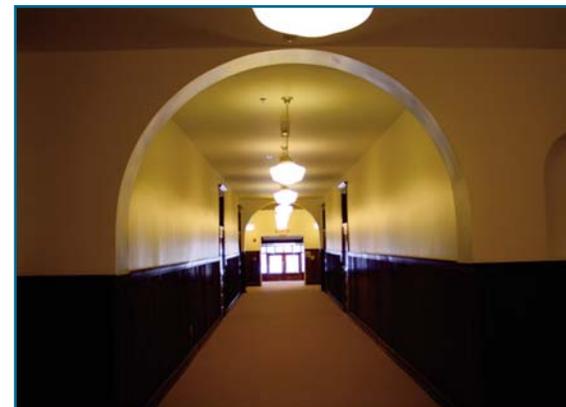
A ductless system
The old building never had duct work to transport air throughout the building so Fujitsu ductless mini-splits worked perfectly. Ken Warren designed the installation so that all line sets were hidden within the walls without any couplings used ever.

Low operation cost
This objective was easy to achieve with Fujitsu ductless systems. Wall mounted 9RLS2 systems are used where the outdoor units could be used indoors and extra low temperature heating wall mounted models 9RLS2H were installed where the outdoor units had to be installed on a flat roof. The high efficiency ratings (SEER and

HSPF) of these models achieved a low cost of electricity per apartment with estimates of $38.00 per month during the summer and $75.00 during the winter.

Individually meter electric cost per tenant

Each tenant pays for their own electricity so single zone, individually metered models were the perfect answer.

Sole source of heat and air conditioning

With Fujitsu 9RLS2 systems providing heat in outdoor temperatures down to -5°F and 9RLS2H systems down to -15°F, using Fujitsu as the sole source of heating during the cold winter months in Michigan was easily achieved. These systems serve as the sole source of cooling in the summer as well. In the corridors 18,000 BTU/h compact cassettes attached to 36,000 BTU/h multi-zone outdoor units were installed to provide both heating and cooling.

Results

The property managers were concerned that Warren Systems would not be able to meet all of their objectives. They were blown away by the performance of the Fujitsu mini-split systems. All goals were met and the property manager has intentions of using Fujitsu in another nearby building he is renovating.

Below is a wall mounted 9RLS2 indoor model shown in a common area.

On a cold February day when it was -12°F the corridors of the hallways were 70°F!

The historical look of the building and isolation of equipment was achieved by installing the majority of outdoor units either on the roof or indoors, in 3 separate mechanical rooms in the basement. This also kept the units isolated to prevent theft.