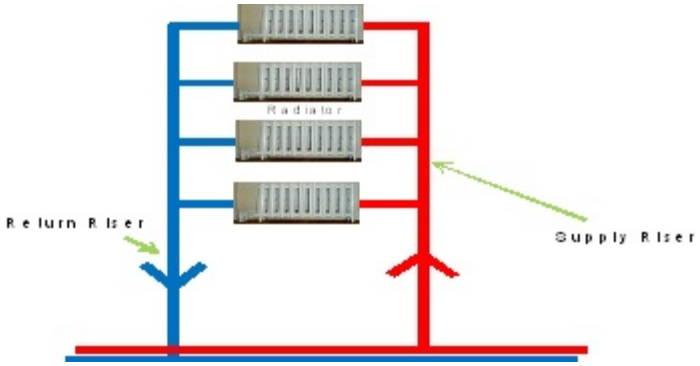
PEPCO™
PECONIC ENERGY PRODUCTS COMPANY

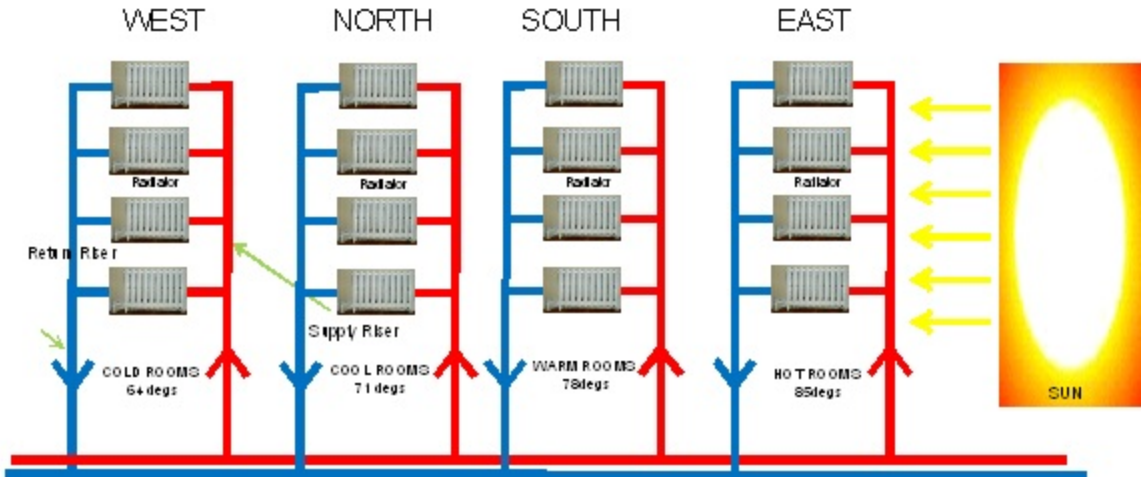
Delta™ CONTROLS

HOW RISER ZONE VALVES WORK

The riser is the pipe that steam or hot water travels thru typically from the basement to the roof. One side of the riser is the supply side and the other is the return side. Connected between the supply and return risers are the individual apartment radiators.



The steam or hot water pass from the supply side of the riser to the radiators that transfer heat to the room. The supply temperature is the hot side and the return is the cool side.



The risers are located around the perimeter of the building and extend from basement to roof and back to the basement with 1 riser typically located approximately every 25'. Without the PEPCO system Steam or Hot Water is supplied to the entire building. Steam or hot water fills all the risers to deliver heat to the building radiators. The rooms on the sunny side become very hot due to solar heat gain while the rooms on the back side remain cold. When the sun rotates around the building the rooms with sunlight overheat while rooms on the back side are cold.

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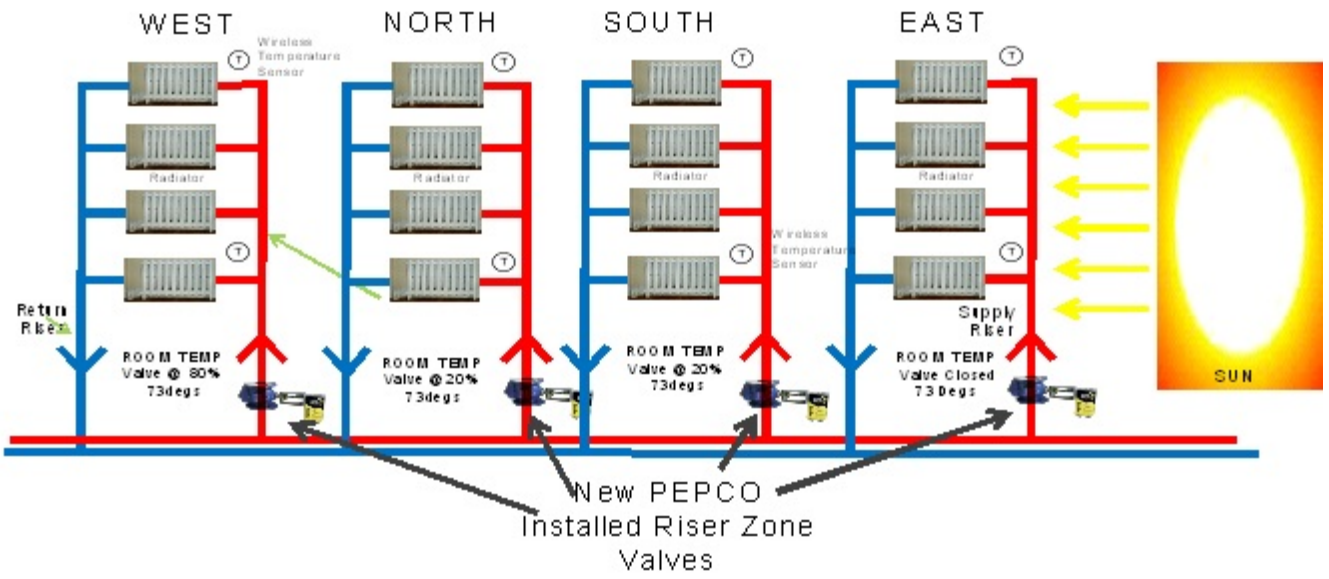

With the PEPCO System, installation of a new electronic riser valves at the base of each riser line prevent the flow of steam or hot water to the risers on the sunny side and force the maximum heat to be delivered to the cold rooms thereby making the cold rooms warm.

Wireless temperature sensors installed inside the rooms vertically up each riser line report the temperature to a microprocessor.

With the PEPCO system, when the room temperatures, heated by its riser reach 73 degs the riser valve closes and opens when the temperature drops to 72 degs. The results is a balanced heat distribution. When half the valves on the sunny side are “closed” the energy usage is cut in half. The amount of fuel or steam needed to heat the building is slashed in half.

Additional Fuel Savings

Night Setback: From 10pm to 5am the room temperatures in each zone is reduced 3 degrees each night and provides additional savings.

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December 17, 2010

Mr. Michael McMahon, General Manager
Morningside Heights Housing Corporation
80 LaSalle Street
New York, NY 10027

Re: Morningside Heights Housing Corporation
Control System Review and Savings
Con Edison Rebate Program

Dear Mr. McMahon:

Morningside Heights Housing Corporation (MHHC) is a residential cooperative apartment complex with more than 980 units, located on the upper west side of Manhattan built in the 1960's. The complex includes 6 high rise buildings and a small amount of commercial space fronting Amsterdam Avenue, comprising a total of over 1,000,000 square feet of rental space. The installation of a energy management system along with heating system controls will provide a substantial benefit to saving energy.

The site contains a central steam boiler that distributes steam via underground piping to the six buildings. The boilers, located in the basement of 80 LaSalle Street are dual fuel capable, #2 oil and natural gas. The boilers have been operated on gas as the primary fuel due to the cost of oil for the past several years, only switching to oil firing when curtailed by Con Edison. In each building's mechanical room steam is divided to provide domestic hot water and building heat. The hot water is created using several semi-instantaneous type steam to water heaters.

The building's heating system is a basic system using a single modulating control valve that controls the flow of steam into the steam distribution header located in the basement. The main valve modulates based on outdoor air temperature. A vacuum system draws back the condensed steam into the basement, after which it is pumped back to the central steam room. The ring header supplies steam to 13 independent riser pipes to serve the apartment radiators. The risers typically serve a vertical column of apartments above each other. Due to the physical orientation of the buildings, primarily in a north / south direction the single modulation valve has proven to be inadequate as a means of proper building temperature control. The apartments on the north side of the building may be satisfied but the south side apartments experience overheating, sometimes to the point of tenants opening their windows.

The proposed Delta Energy Management System (EMS) has the capability to monitor, regulate and control all aspects of the building heating system. The system includes the installation of individual riser modulating control valves, condensate return temperature sensors, and various space temperature sensors all designed to work together to provide efficient space temperature control throughout the building. Preliminary results from providing manual control to simulate the future control system resulted in lower steam condensate return volume, as well as overall lower condensate return temperatures. Initial reductions in steam consumption were about 29% as compared to buildings that did not have any control; these savings are directly related to potential savings in fuel used to generate the steam. In addition to savings a substantial reduction of hot and cold complaints was also realized during the testing.

Over the past two years MHHC has used an average 845,600 therms/year in the central boiler plant for the production of steam for the site. As previously stated this steam is used for both domestic hot water and building heating needs. In order to estimate the portion of gas used for building heat we must determine the gas required for domestic hot water.

The building heating system is manually isolated by the facility staff during the months of June, July, August and September, isolation of the building systems is required to avoid the potential of steam leaking by the main control valve and causing undue heating of the apartment spaces. Based on the past two operational seasons the facility has experienced average gas usage of approximately 18,000 therms/month during the summer months. It can be reasonably assumed that the average gas consumed to generate domestic hot water is relatively constant throughout the year.

Estimated Potential Saving due to a new EMS:

Annual Fuel Gas Consumption – 845,600 therms

Fuel Gas used for domestic water production – 216,000 therms (18,000 x 12 months)

Gas Consumption for building heat only – 629,600 therms

Estimated Gas Savings due to new EMS – 182,584 therms (629,600 * 29%)

Estimated Cost Savings 182,584 therms * $2.00 = **$365,168**

If you have any questions or require additional information, please call me directly.

Sincerely,
Schuyler Engineering, P.C.

Robert Foley, P.E.
Project Engineer

Encl.

enocean alliance MEMBER

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