



SCHUYLER ENGINEERING, P.C.

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June 14, 2010

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

**Re: Morningside Heights Housing Corporation
Bldg 70 Pilot Project
Control Systems Review and Upgrade**

Dear Mr. McMahon:

Schuyler reviewed the available data for the pilot project in Building 70, and cost proposals provided by Pepco to expand the control system to include additional buildings. The pilot project included the installation of new modulating steam-riser valves and the installation of a new Building Management System (BMS) for controlling and monitoring building temperatures. The project appears to be a success in terms of both reducing tenant complaints and saving energy. Testing performed last year documented a 29% reduction in the steam used to heat the building. It is Schuyler's recommendation that MHHC consider implementing this modernization effort at the other buildings onsite.

HISTORY:

Building 70's original steam heating control was a basic system using a single modulating control valve that supplied steam to all 13 steam risers at the same time. Steam risers start in the basement and extend up the building to serve the apartment radiators. The risers typically serve a vertical column of apartments above each other and those apartments separated by a common wall, such as all the units on the A line would be supplied by a single riser. In general, similar complaints (cold or hot) were made by tenants served by these common risers.

The pilot project resulted in the ability to individually control the steam supplied to each of the risers in response to the average apartment temperature served by that riser. This riser-valving concept was partially installed years ago at Morningside, but the installation was never completed. An early version of a BMS was also partially installed at Morningside. That system, fabricated by Liberty, is no longer available. In addition control companies no longer support this equipment.

To quantify the savings and evaluate the effectiveness of the pilot project condensate meters were installed in the basement of Building 70. The condensate meters quantified the volume of steam used for heating. A second condensate meter was installed in Building 501 which has not undergone any control system modernization. The physical arrangement, occupancy, and construction these two buildings are very similar and suitable for direct comparison. The meter in Bldg 501 was used as a baseline to calculate savings in Bldg 70 resulting from the new system.

Steam usage was measured from October 2009 through the end of January 2010. It was found that on average the heating steam used in Building 501 was about 29% higher than Building 70. During the specific period November 2009 through January 2010, Morningside used over 930,000 lbs less steam to heat Building 70 than to heat Building 501. In addition to lower steam consumption, the average condensate-return temperatures from Building 70 are about 15°F lower than Building 501. The lower condensate temperature indicates increased energy efficiency in Building 70.

In summary, the pilot project has resulted in more comfort to tenants as evidenced by a reduction in complaints, and fewer maintenance calls. The project has also resulted in approximately a 29% reduction in steam use for heating. These savings would be the minimum expected, as the system should result in even greater control and ultimately savings during the late fall/early spring time when the outside weather is unpredictable and varies greatly. Morningside could potentially save about 29%, or more on it's total heating costs once all the buildings on site have this system installed. Based on the 2009 operational season, the annual savings could be about \$435,000 if the system is installed in all buildings.

CONTROL SYSTEM

Pepco installed the BMS, fabricated by Delta Control Systems to replace the Liberty system. The Delta BMS not only controls the heating system components, but was also expanded to monitor other related functions such as outside air temperature, wind speed and other items that lead to tenant comfort and affect operational costs. The Delta control system accomplishes all the same functions as the original system, but it can also be programmed to perform additional tasks. The Delta system can be expanded to monitor energy usage and control lighting, fans, and even sprinklers.

UPGRADE PROJECT

Schuyler reviewed the cost proposals from Pepco to expand the BMS and install it into the rest of the buildings onsite. The work would include installing additional space temperature sensors into building 70 and adding additional monitoring points in mechanical spaces. The cost for this work is \$815,000.

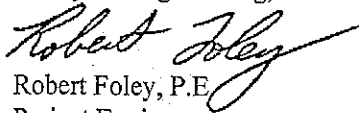
Based on previous projects and consultations with other BMS suppliers Pepco's cost of approximately \$1,300 to \$1,500 per point is reasonable. Our assessment is based on work performed in New York City using trade wage rates.

The cost to install the valves has been excluded from Pepco's cost proposal as this work is performed by plumbers. However, the cost to supply the valves is included. Schuyler has finalized the documents so that Morningside can competitively bid the plumbing portion of the project. It is estimated that the plumbing work would cost about \$312,600. This estimate includes a 5% contingency.

Adding together the controls and plumbing work, it is estimated that expanding the pilot project to the remaining 5 buildings would cost about \$1,112,000. Based on the saving from Bldg 70, the payback would be less than 3 years.

If you have any questions concerning this information, please call me directly.

Sincerely,
Schuyler Engineering, P.C.


Robert Foley, P.E.
Project Engineer