

Inspection Report of Evaluation of Electric & Gas Service and HVAC Unit in New York
Multi-Unit Condominium

1. Background

Following the construction of a multi-unit Condominium located in Suburban New York, the estimated utility charges for electricity and gas required to serve the common areas in the building were estimated to be around \$6,000.00 per year by the building developer. The common areas of the building are considered to be the lobby and the first, second and third floor corridors.

During the first and second years of operation of the Condominium, the utility charges for the common areas were approximately \$50,000.00, much higher than the projected values by the developer.

Based on the discrepancy of the common area energy usage between the estimated and actual values, this Energy Consultant was requested to perform the following tasks:

1. obtain a copy of the building drawings from the Local Building Department.
2. review the electrical, gas and HVAC drawings for the common areas and identify whether energy was being diverted to other building areas.
3. perform a site inspection of the Condominium common areas to verify the design drawings for these areas.

2. Inspection Results

The electrical and gas requirements for the lighting, heating and air conditioning of the common areas in the Condominium are provided by the local gas and electric utilities. The gas service is metered outside the garage and the electrical service in the electrical room.

There are two (2) electrical meters, one which serves the common areas and the second one on the 4th floor loft. The electrical meter for the common areas is registered to the Property Manager and the one for the 4th floor loft to the Condominium Owner.

Electrical Service

The electrical power supplied by the electric utility is required for the illumination of the lobby, 1st, 2nd and 3rd floor corridors, as well as the electrical outlets in these areas.

In addition, the electrical power is required for the operation of the following equipment:

1. building elevator
2. condensing units associated with the HVAC units (Heating, Ventilation and Air-Conditioning) that serve the common areas only
3. various fans associated with these HVAC units
4. electrical heaters located in the following areas:
 - a. recycle room - 1 heater rated at 3.7 kW
 - b. garbage room - 1 heater rated at 3.7 kW
 - c. electrical room - 1 heater rated at 3.7 kW
 - d. fire pump room - 1 heater rated at 3.7 kW
 - e. sprinkler system in garage (plenum area) - 13 heaters rated at 3.7 kW each for a total of 48.1 kW (see Photographs 1, 2 and 3)

Gas Service

The gas supplied by the gas utility is required for the operation of the HVAC unit for heating purposes, primarily during the winter season. However, the gas is also used during the spring and fall seasons when the outside temperature falls below 68°F

The gas may be also used in the summer time for the HVAC units for heating purposes when the outside humidity levels fall above a preset value, even though the outside temperature may be below the preset cooling value of 78°F. When this occurs, both the condensing and heating units of the HVAC operate simultaneously.

3. Evaluation Results

Based on the our review of the electrical and mechanical drawings for the common areas, and the inspections of these areas, this Energy Consultant found the following:

1. The electrical energy billed for the common areas does not include the energy used for lighting or cooling the 4th floor loft area.
2. The electrical energy billed for the common areas includes the electric heaters located in the electrical, fire pump, recycle and garbage rooms, as well as the electric heaters located in the garage. The electric heaters in the garage are used to protect the sprinkler system piping from freezing during the winter time. These electric heaters are heavy electrical loads which are not apparent at first sight.

A more efficient heating system, such as the installation of a small boiler, to heat the electrical, fire pump, recycle and garbage rooms, and the sprinkler system in the garage would have been more economical to operate, but more expensive to install.

3. Heating and cooling in the common areas (lobby and corridors) requires bringing 100% outside air all the time, without the use of air re-circulation. This means that the outside air is temperature conditioned and brought to the lobby and corridors. The exhaust of this temperature conditioned air is accomplished by allowing the air to leak into the apartments through the apartment doors, and then exhausted through the kitchen and toilet exhaust fans. This is a continuous process operating 24 hours per day, seven days per week, 365 days per year. The design of the HVAC system for the common areas, and exhausting it through the toilet and kitchen exhaust fans is very inefficient.

4. Evaluation Summary Results

The Energy Consultant's review of the electric and gas usage for the common areas in the building revealed the following:

1. The electric and gas provided by gas and electric utilities for the common area use is not diverted to other areas.
2. The electric service for the 4th floor loft is metered separately from the common area electric meter.
3. Electric heaters are used for heating various areas, which are not apparent at first sight. These electric heaters are inefficient to operate, but less expensive to install than a more efficient system.
4. The HVAC system for the lobby and corridors uses 100% outside air, without the use of air re-circulation. This is very inefficient to operate, but less expensive to install than an energy efficient system.



Photograph No. 1 - Fire sprinkler heads in the garage.



Photograph No. 2 - Garage Plenum where electric heaters are installed to prevent freezing of fire sprinkler system in the garage.



Photograph No. 3 - Garage Plenum where electric heaters are installed to prevent freezing of fire sprinkler system in the garage.