

THE IMPORTANCE OF MECHANICAL SYSTEM MAINTENANCE

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Introduction.

Many schools have failed heating, ventilating, and plumbing systems due to poor maintenance or lack of maintenance, usually because the maintenance department is understaffed, underbudgeted, and overwhelmed. Often these broken down mechanical systems are ripped out and replaced years before what their useful lifetimes would have been with proper maintenance. In the meantime air quality, and comfort, ergo learning all suffers. In the long run this needlessly raises the costs of owning and operating our schools. We often wonder how many of the systems we design are working properly five years after they are installed.

The Maintenance Budget.

Often when school budgets are prepared for the voters the maintenance budget is the only place where "discretionary costs" can be cut to meet budgeting goals. Maintenance is deferred year after year to the point where the problems become overwhelming and it becomes easier to rip out the mechanical systems and start over. Many of these older systems were well designed, were capable of meeting modern ventilation requirements and providing good comfort, but cannot be saved. We have seen many instances of this in our eighteen years of business, and almost 100 school projects.

We have seen a few schools where systems over thirty-forty years old are still working perfectly, meeting codes and providing comfort and good air quality, because they have been continuously well maintained. This is very gratifying, and saves the school districts and the State a lot of money. This level of maintenance requires a dedicated and knowledgeable staff and a proper maintenance budget. In our experience frugal voters like to maintain what they already own, and often dislike new construction.

The Maintenance Staff.

The desirable goals of comfort, good air quality, and energy efficiency combine to drive up the technical complexity of modern heating and ventilating systems. Gone are the days of a single ventilation chase in the corner of each classroom with a chain operated damper. (It is interesting to note however that existing schools where these systems are still operational, i.e. not boarded over, are probably better off in terms of air quality than schools with a modern but non-operational ventilating system.) A well designed mechanical system in our view is one where simplicity is one of the major design goals along with energy efficiency, comfort and air quality.

Some of this complexity is inescapable, and it is unrealistic to expect the maintenance staff to be able to perform all maintenance and repair tasks completely in-house. It takes many different engineers (HVAC, Electrical, Plumbing, Sprinkler, etc.) to design the systems which go into every school building, how can the maintenance staff be expected to fully understand each system? It is enough to expect that they know when the systems are not operating properly and to know where to go for help.

Maintenance of mechanical (and electrical systems) is far different than housekeeping and it is important to understand this difference and to know when to go to outside contractors for help. The school boards should encourage this, especially in the smaller school districts where the maintenance

staff is really mostly a housekeeping staff. The school boards and States should provide a budget for hiring outside contractors on a regular basis.

In a Perfect World.

A lot of attention is being paid to a commissioning process where immediately after construction, a commissioning agent is retained to go through every portion of the mechanical systems to determine whether they are operating as designed. There are a lot of components to check and this is a fair amount of work. In a perfect world it would be good to do perhaps a scaled down version of the same thing on a regular basis (every 3 years?) for every mechanical system in every school.