



The design of mechanical systems for schools presents many challenges. In our opinion, a mechanical system should meet 5 primary goals:

**energy efficiency**  
**comfort**  
**air quality**  
**durability**  
**simplicity**

Energy efficiency is important in order to minimize annual operating expenses. A comfortable environment with good air quality is essential to the mission of the school. Mechanical systems should be durable and simple to operate.

There are certain trade-offs in meeting these goals. For example, increased efficiency may come at the expense of durability and simplicity. Increased levels of air quality may come at the expense of energy efficiency. We strive to design mechanical systems that properly balance these design goals.

The system type, controls, and funds allocated for mechanical construction have major influences on meeting design goals. We try to design flexible systems. For example, we prefer systems in which the outside air qualities can be adjusted to satisfy the very changing air quality criteria. We also try to design systems that could easily accommodate future addition of air conditioning or wood chip heating.

The choice of the type of controls can have significant impact on all of the design goals. More often than not, problems with the mechanical systems can be traced to control problems. The new direct digital control systems are very good. They provide high levels of comfort, increased energy efficiency and can help diagnose control problems.

The amount of money available also significantly impacts the design goals. We attempt to design systems with reasonable life cycle cost paybacks in terms of energy efficiency and durability, and systems which meet the budget.