Pushing the Envelope – Energy Efficiency

A high percentage of buildings in our region predate 1980. These older physical plants are characterized by mechanical systems that are approaching the end of their useful life and by building envelopes which do not meet current energy conservation codes.

The costs of operating these older buildings continue to skyrocket in lockstep with energy and utility costs. These costs have hit such high levels that a tipping point is being reached where much of the capital investment needed to upgrade physical plants can be offset by energy savings and government grants.

A four pronged approach is most often utilized to optimize a building’s energy performance: tighten the envelope by replacing roof and window systems with better insulated ones; install more efficient equipment such as variable speed fans and motors; use alternative energy sources such as cogeneration to take advantage of surplus power and waste heat; and utilize a building management system to facilitate a preventative maintenance system and allow systems to be monitored and adjusted for optimum performance.

Today’s modern membrane roof systems have highly reflective (white) traffic surfaces which reflect UV radiation and prevent the rapid deterioration of asphalt products. These white membranes also reflect heat which helps to reduce a building’s air conditioning load.

Variable speed equipment (fans and motors) can be adjusted to meet exact load conditions resulting in less wasted energy. Lighting upgrades which incorporate high efficiency lamping and ballasts can significantly reduce lighting costs. Many utility companies and some governmental agencies offer grants and rebates which can offset much of the cost of these fixtures.

Cogeneration utilizes equipment with a natural gas fuel to generate electricity which can be used to power in-house equipment and/or be sold back to the utility company during peak periods. Waste heat from cogen radiators and exhausts generates hot water via heat exchange. This hot water can meet hydronic and/or domestic usage demand. In this scenario, a facility’s existing boiler plant becomes a back-up system when hot water demand exceeds cogen system capacity.

Building management systems allow the physical plant to be monitored and controlled on-site or remotely from a computer. Preventative maintenance schedules are overlaid ensuring their timely management and implementation.