

Sustainability Desk with Sam Pobst: Productivity by design

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Sustainability Desk

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According to the Building Owners and Managers Association (BOMA), the average cost of energy for a typical office building per square foot is \$2.56, maintenance is \$2.29, rent is \$25.05 and wages are \$282.23 per square foot. Energy costs, while important, are insignificant when considering the impact of providing for the well being of the occupants as it affects their productivity. A 1 percent gain in productivity will more than cover all building energy costs. We need our employees to be really happy.

There are two key elements we look at in building design and operations that affect worker productivity. These are building materials and chemicals that affect occupant health, and how much control individual workers have over their own environment.

Building materials historically were manufactured with Volatile Organic Compounds (VOCs), which were used in adhesives and paints to carry them to the desired surfaces. The VOCs then evaporated very quickly. Unfortunately, they were also very toxic. We spend at least 90 percent of our time indoors, and the accumulated toxins can reach toxicity levels nine times greater than outdoors. Over the last decade suitable replacements have been found for nearly all VOCs in building materials, and today we construct new buildings with virtually no off-gassing materials.

Unfortunately, many other chemicals now regularly enter the workplace, including exhaled carbon dioxide, copier toners, cleaning chemicals, pesticides, art supplies and tobacco. Fortunately, there are numerous non-toxic substitutes for these chemicals (except perhaps for breathing and tobacco), so we can minimize the introduction of chemicals indoors. Meeting current code requirements for outside air ventilation assures an appropriate supply of fresh air circulates through a building, and reduces the remaining toxicity levels we cannot control.

Particulate matter, including mold, pollen and heavy metals enters buildings via our shoes and outside air intakes. We can trap particulates with entrance mats and air filters, thereby extending the life of flooring and heating and cooling equipment.

These chemicals and particulates affect respiratory health and have an impact on worker productivity. However, implementing a plan for green cleaning, integrated pest management and HVAC system check-ups for outside air requirements may reduce absenteeism by one day per person per year, for a 0.4 percent productivity gain.

On the cost-savings side, lighting controls allow for noticeable reductions in energy use. Reduce general lighting

to minimum levels that allow safe passage through a building, and provide the amount of lighting required for an individual to perform a specific task at their workstation. This delivers significant energy savings and greater comfort for employees.

Providing temperature controls eliminates time lost to complaints. We all operate at different temperatures based on age, metabolic rates, proximity to heating, cooling, and ventilation sources, activity levels, or how much clothing we have on. There are many techniques for satisfying temperature concerns, but spending time definitively resolving as many of these as possible will translate into improved productivity.

Our comfort level increases significantly with access to a view. As a matter of survival we need to know if it is snowing or raining, or if Tyrannosaurus Rex is pursuing us. A study of students in classrooms with and without windows revealed a 20 percent difference in test scores (See HMG.org). A study of 300 retail stores by the same group determined that sales improved by 40 percent with access to natural light.

Our interior environments have a profound effect on productivity. At \$283/per square foot there is plenty of room for improvement.

The U.S. Green Building Council has aggregated studies of measured productivity gains of between 2-16 percent. In the two productivity studies I have helped document, we measured 4 percent and 8 percent gains, attributable to improved health, how we relate to our indoor environment and our ability to control it. We can only measure the effect after the fact, but the evidence that performance improves as people are more comfortable in their environment is well documented and intuitive.

The U.S. Green Building Council is a coalition of leaders from across the building industry working to promote environmentally responsible, profitable and healthy places to live and work. The West Michigan Chapter provides and develops leadership through affiliations and education at all levels. Please send comments and column proposals to chuck.otto1@gmail.com.

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