

Sustainable Inside

How adaptable architectural interiors can extend the lives of buildings, operate more efficiently and provide environmental benefits.

By Mark Harrigan and Marc Burton

With the focus on the recent “Green” building evolution, it is easy to view these new structures as the way of the future. However the largest part of the building, and main revenue generator for building owners, the interior rentable space is often constructed as it has been for the past 50 years. Office building interiors are regularly altered, remodeled, rebuilt and/or turned over to new tenants. It is an area that can have a large and continual environmental impact.

Using space and energy more efficiently, reconfiguring data and power without disposing of potentially harmful waste, and moving interior walls to accommodate business needs without filling landfills are just a few of the keys to adaptable interior architecture. By utilizing adaptable architecture the office interior has the opportunity to provide not only environmental benefits, but economic benefits too.



Adaptable architecture is a holistic approach which can include: access floors, modular electrical and data distribution, moveable floor-to-ceiling walls, two-component lighting, day-lighting and flat-panel monitors. These combine to create an environmentally responsible alternative to traditional interior construction and the continual cycle of demolition, disposal, construction, demolition. Even if we are paying more attention to recycling building materials, it takes much less energy and cost to re-use materials.

Construction and Facility Management Principles



An access floor offers an excellent base for a sustainable office space. Plug and play technology for power and data encompassed in a universal zone layout does two things. One, it allows you to reconfigure your interior space without cutting cable and adding electrical. Secondly, you will rarely have to bring in specialized trades when reconfiguring the space. A low-profile access floor (2 ½”) is great for existing buildings with ceiling height issues, while still providing plenty of cable space and flexibility as your needs and technologies dictate. An access floor with a profile of 10” or more allows you the opportunity to include your HVAC distribution into

the floor where it is much more effective and cost efficient while still maintaining the ability to route “plug and play” power and data. Having HVAC in the floor also creates building shell savings. The new Compuware building in Detroit, for example, was able to save 8,000 tons of steel by having in-floor HVAC on 15 floors and by taking height out of the building as well!

Moveable floor-to-ceiling walls are pre-engineered and made in a controlled manufacturing setting enabling all by-products to be recycled. This not only reduces waste materials (gypsum board and framing materials erected on-site are typically over-ordered by 10% as a contingency), but also reduces the time characteristically required for framing, electrical rough-in, enclosing the walls, taping, texturing, painting, electrical trim out and installation of base trim, because the walls are shipped fully unitized and ready to install. Once installed, moveable walls allow not only for infinite reconfigurations, you can actually take the walls with you when you vacate the space. By using sliding doors on the moveable partitions instead of traditional swing doors, each private office can save approximately 30 to 50 square feet by providing a more efficient furniture layout.

The entire pre-engineered and manufactured interior office also shortens the construction schedule and requires fewer trades-people required on-site. The process cuts down on vehicles traveling to the site and the number of trips those trades need to make. Of course when it comes time to reconfigure the space, the schedule is a quarter of a traditional demolition/re-build and costs 90% less. Moveable walls, plug and play technology and flexible furniture mean the internal environment isn’t polluted with dust and debris. So work can go on without jeopardizing employee health and safety or finding a flex space until the work is done.

Energy Usage and Life Cycle Cost Savings

Office lighting is one of the biggest complaints of office workers. Generally the office is over-lit which leads to employee discomfort and high energy and cooling costs—"Equal light for all works for no one". Hallways, computer environments, paperwork areas and meeting areas all need different levels of light. By installing indirect, ambient light and user-controlled task lighting with compact fluorescent lamps, you'll lower operating costs, employee error rates and sick days. Additionally, the use of a Digital Addressable Lighting Interface or "DALI" compliant system will allow for better control and maintenance of your office lighting right from your PC. Per the EPA, *"If all commercial buildings switched to energy efficient lighting it would be an equivalent CO2 reduction to getting 15 million cars off the road."*



Day-lighting is a design principle which takes advantage of using what is free and coveted by every office worker. By placing private offices (with plenty of glass) in the middle of the floor-plate, all of the employees in the open office layout can take advantage of sunlight and views, all without diminishing the stature of the private office.

Another overlooked area is the traditional CRT monitor. It uses 63 percent more energy than a flat panel monitor and produces 48 percent more heat. The flat panel monitor also has less flickering, gives off less radiation and has inherently less glare. Additionally, by requiring less space, a flat panel monitor can result in narrower work surfaces and ultimately less real estate is wasted and more importantly, paid for.

These lighting, and electrical costs combined with the savings inherent in an under floor HVAC system can provide more than a 50% savings on energy costs when compared existing installed technologies.

It is important to understand that even if the building envelope is well designed and built with sustainability in mind, a conventionally built interior can sabotage much of that work. For office interiors to stop being an environmental obstacle, they have to be flexible, space saving and energy efficient. By providing the best built exteriors with the most adaptable interiors, we can extend the lives of our buildings, save significant dollars, and make our office environment much more pleasant.

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