03 ADAPTABLE DESIGN


Cable Management Solutions, Inc.

Overview

Over the life of a building, offices are regularly undergoing renovation as businesses reorganize, expand, contract and replace outdated technologies. Flexibly-designed work spaces allow these necessary changes to be made with less money and less unproductive downtime.

Adaptable design "future-proofs" office space by providing for the integration and adaptability of these building systems:

- Lighting
- Heating, ventilation and air conditioning (HVAC)
- Connectivity for voice, data and power systems
- Interior space
- Building shell

"Treat a space as a strategy rather than a plan"

— Buildings that Learn, Stewart Brand

Benefits

- Reduces unnecessary waste
- Maximizes energy efficiency
- Economizes space performance
- Improves occupant comfort
- Reduces disruption and downtime during change in use
- Lowers cost of reconfiguring office space

Quick Fact

Pennsylvania Department of Environmental Protection estimated that a churn cost of $2,500 per employee was reduced to $250 through use of raised floors, adjustable system furnishings, and adjustable HVAC. The net savings of $843,750 exceeds the annual energy costs of the entire facility.


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Strategies

Use demountable walls as a flexible alternative to fixed, drywall construction. These prefabricated, moveable and modular panels gang together to enclose a space. They are typically 100% reusable compared to drywall which has to be demolished and disposed to change a space. Although first costs of moveable walls are usually higher than conventional walls, one move or adaptation can quickly pay back the cost differential. Organizations save on staff downtime and disruptions and save money on disposal fees.

Minimize built-in walls and millwork to create a more adaptable and flexible space for occupants during the lease term and to reduce waste and additional labor during the next build-out. If full-height walls are required, consolidate them near the core of the building to help maximize daylight to regularly-occupied spaces.

Install raised access flooring so that data, voice and power systems can be easily and efficiently re-configured as needs change. Underfloor air distribution can also be installed to increase energy efficiency and to allow individual occupant control over air flow. The added costs of $5–7 per square foot of raised flooring are quickly offset by the elimination of ductwork, life-cycle material savings, configuration flexibility, downsized mechanical equipment and energy efficiency.

LEED®-CI v2.0: Commercial Interiors

By implementing various adaptable design strategies, your project may be eligible for the following:

Energy & Atmosphere
EA Credit 1.3: Optimize Energy Performance, HVAC

Materials & Resources
MR Credit 3.3: Resource Reuse (if reusing moveable walls)

Indoor Environmental Quality
EQ Credit 6.2: Controllability of Systems, Temperature and Ventilation

CASE STUDY

Amazon.com

Amazon.com's headquarters complex was not effectively accommodating the continual growth and change of this exuberant company. Work areas were over-crowded, and conference and storage rooms had been transformed into makeshift office space. Programmers requiring focused concentration were seated along busy, disruptive circulation paths.

To determine individual needs and the organizational culture, a series of staff interviews were conducted at the outset. A flexible, modular planning concept was developed that incorporated innovative approaches to address the requirements for customizable and sustainable workspace.

A movable wall and spine system constructed of sustainable materials was incorporated into the planning. It allows for rapid re-configuration and customization of the work environment. The system is augmented by the cost-efficient re-use of Amazon's existing furniture.

Circulation through the space is efficient and less disruptive, separating private work areas from more interactive shared areas. The newly-designed concept plan can flex to absorb up to 44% additional staff capacity. Amazon now has the ability to increase both productivity and density while reducing construction and furniture costs per employee by more than 20%.

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Checklist

Space Planning

- ☐ Specify or design building components that are easy to disassemble or deconstruct after their intended use.
- ☐ Consolidate support functions that typically need full-height walls and which do not need much natural light together and near the building core, if possible.
- ☐ Design spaces (ceilings, lighting, data, and electrical) so that multiple functions can be served within each space.
- ☐ Design on a modular footprint so change can be planned efficiently and does not require re-configuration of adjacent spaces. Planning on a 16' x 24' module, for example, would allow a series of 6' x 6' workstations, 8' x 8' workstations, 8' x 12' offices or other combinations.
- ☐ Plan for the next generation of technology (i.e. photo-voltaics, fuel cells, rainwater re-use, data upgrades, etc.), by designing infrastructure to support its future implementation.

Systems

- ☐ Design HVAC systems and sprinklers to serve both initial and future planning needs.
- ☐ Design light fixtures and network cabling with additional "reach" for maximum flexibility (within a cost-effective limit) in future placement; without burdensome reliance on outside contractors.
- ☐ Consider wireless technology and mobile phones to enable staff to move through spaces as their needs change.

Walls

- ☐ Consider demountable walls in locations where they would benefit the occupants' ability to expand or change the size and function of a space.

Flooring

- ☐ Evaluate the suitability of raised access flooring. This can maximize flexibility of locating data, electrical and occupant-controlled HVAC diffusers.

Interior Design

- ☐ Consider modular casework or furniture items in lieu of built-in millwork to maximize flexibility and allow portability.

Resources

www.cbe.berkeley.edu Search the Center for the Built Environment's web site for under-floor air for case studies, research, and more.

www.wbdg.org Search Whole Building Design Guide for "information technology" to get more detailed information on its integration into building design.

www.edcmag.com Search Environmental Design + Construction magazine's article on "demountable partitions" for comparative data to conventional walls/framing.

www.hermanmiller.com Search for "churn" and "alternative work styles" for white papers on these topics.