

## *green TI for office, retail and restaurants*

*Tenant improvements (TI) are improvements to a tenant's office, retail or restaurant space. "Green" TI strategies help to create workspaces that are comfortable and healthy while reducing negative environmental impacts of the construction and remodeling process.*

Tenant improvements are the largest area of commercial construction activity throughout the US. A comprehensive approach to green tenant improvement facilitates effective design solutions. Savvy real estate developers, property managers, business owners, and non-profit directors realize that green tenant improvements can save money, improve the quality of their space, enhance productivity and improve general well-being and comfort.

Use the design strategies outlined in this article for your next tenant improvement project and achieve the following benefits: resource conservation, materials efficiency, indoor air quality, thermal comfort, acoustic quality, visual quality, and social responsibility.

## Strategy #1 : Research & Planning

### review building attributes and maintenance policies

Find out if the building has a LEED certification or Energy Star rating. Look for operable windows so that you can use natural ventilation rather than mechanical. Make sure the space has adequate daylight. Ask the property manager about maintenance practices in place. Are non-toxic cleaning products used? Is recycling collection and removal provided? These existing factors all contribute to the “greenness” of the space.

### select your green design team

A design professional has vast information at his/her finger tips. Before you choose an architect or designer, make sure he/she is focused on green and sustainable building practices and will incorporate current and applicable systems and materials in a holistic approach to your space.

### consider keeping in place or reusing as much of the existing improvements as possible

Carefully consider the needs of the occupants and examine the existing conditions in the space. The less demolition that is required, the greener the TI process will be. This is a simple and effective solution, easily applied to all project types and includes items such as: walls, doors, ceilings, shelving, light fixtures (if energy efficient), plumbing fixtures and fittings (if efficient), office partitions, casework and flooring.

## Strategy #2 : Efficient Interior Layout

### layout efficiency

An efficient layout of the interior space is essential to individual productivity, comfort and natural resource efficiency.

### limit permanent walls through the use of modular pieces

Making use of modular partition walls, desks, workspace configurations and bookshelves is more cost effective than built in pieces. Modular bookshelves, for example can be used as visual screens to divide the space, but also can be taken apart, moved or even sold.

### noise control

Many variables contribute to occupant comfort, and noise is one which must be considered. A key tip for noise control is to centralize major equipment such as chillers, pumps, generators and fans. Walls and ceilings of these areas should be insulated accordingly to decrease noise levels.

Similar consideration should be taken to noise and activity of occupants. Use partition walls, screens or doors around conference rooms and other high activity areas to contain noise, reduce distraction and increase privacy. Using sound absorbing materials helps control sound transmission and echo. Avoid large areas of smooth, hard surfaces.

## Strategy #3 : Appropriate Finishes and Furnishings

salvaged, repurposed and recycled materials

Projects which incorporate a creative reuse of materials can offer playful and diverse solutions to enliven your space. Re-purposing materials is one of the best ways to divert materials from the landfill, reduce cost, and simultaneously think outside the box with regards to material reuse. A design professional can determine whether a material is suitable and worth salvaging. His/Her creativity, design sense and familiarity with construction can transform junk to jewel, while even saving money.

reclaimed furniture

Consider re-upholstery or tap into local resources such as the ReSource yard, Facility Cycle ([www.facilitycycle.com](http://www.facilitycycle.com)), used furniture outlets or consult a design professional on how to revamp existing pieces. Some office furniture dealers that specialize in new goods also carry a stock of lightly used pieces that can be obtained at a fraction of the cost of new ones.

durable materials with sustainable attributes

Durable finishes include high quality flooring, wall coverings, baseboards, tile and countertops. Top choice selections include:

Flooring:

- concrete (can be stained for a truly unique and customized aesthetic)
- tile (with recycled content) and stone (domestically produced)
- reclaimed wood
- natural linoleum (not to be confused with vinyl)
- rubber
- cork
- woven strand bamboo
- carpet tiles (often preferable to broadloom goods)
- wool carpet
- recycled content carpet

Counter Tops:

- recycled plastic content
- recycled glass and quartz
- recycled paper
- reclaimed wood
- metal
- linoleum
- concrete

Casegoods:

- NAUF (no added urea, formaldehyde) products
- FSC certified wood
- employ local woodworkers for production
- no rain forest or exotic woods

- water based/no VOC finishes

#### Wallcoverings:

- no/low VOC paints
- PVC free, recycled content, durable wallpapers

#### Textiles:

- recycled content and durable
- from rapidly renewable resources, such as cotton, wool, linen, bamboo

#### Window coverings:

- cut glare and reduce solar heat gain
- maintain exterior views for occupant comfort and well being
- PVC free, recycled content
- cotton, polyester, linen - with proper fire retardant

avoid introducing pollutants

Select finishes that have zero/low VOC content. Be aware also of the chemicals present in cleaning and maintenance products and strive for natural, non toxic products whenever possible.

social responsibility in material selection

Paramount to green tenant improvement strategies is the use of local, reclaimed, renewable and recycled materials in construction and products, which minimizes transport emissions, stimulates investment in local natural resources and boosts the local economy.

### **Strategy #4 : Efficient Mechanical, Electrical and Plumbing**

ensure mechanical components are as energy efficient as possible

Consult a professional to determine the efficiency of your current mechanical systems and consider optimization for long term savings. A mechanical engineer can properly size the system and, working early on with the architect and designer, locate ducting in the best way possible for the space layout.

For new installations, consider a raised floor system which allows mechanical and electrical distribution to occur below the floor. This system results in smaller HVAC equipment and lower energy costs, improves indoor air quality, contributes to greater comfort, and provides optimal wire management. It also facilitates future layout changes and contributes to a cleaner aesthetic.

HVAC filtration and zone control

Air quality and individualized control are critical to user comfort. Make sure to use at least medium efficiency MERV 8 filters, in order to remove pollen, dust, smoke and other harmful contaminants from the air. Use walk off mats as a simple tool to cut down particulates brought in from the outside.

Zone control in your HVAC system enables you to control the temperature within any space. The ability to condition the spaces in use and limit energy consumption in unoccupied spaces increases energy conservation.

#### automatic temperature controls and scheduling

Make use of digital technology and programmable temperature controls, scheduling devices and occupancy sensors as tools to control energy use.

#### ventilation

A tight, well-insulated space saves energy and increases comfort for its occupants. However, proper ventilation is a key to keeping a space and its occupants healthy. Ventilation can be as simple as opening doors and windows to get fresh air. Other examples of ventilation support include ceiling fans, surface mounted fans, heat and energy recovery ventilators (HRVs/ERVs) and range hoods, among others. Whether the need is to exhaust moisture from bathrooms, cooking odors from kitchens or improve overall air quality throughout the space, diverse energy-efficient solutions are available.

#### testing and balancing

Testing and balancing are essential to a successful heating, ventilating, and air conditioning system. Appropriate testing will ensure correct flow of air and water for optimum operating conditions, comfort levels, and energy efficiency.

#### thermal comfort

Thermal comfort is a basic need of human beings and has been proven to increase creativity and productivity, contribute to good health and decrease absence or leave. Primary considerations for determining the optimal thermal environment include air temperature, air speed and humidity. Ensuring that the work environment is comfortable—neither too hot nor too cold—will promote productivity and general well-being.

#### passive solar design

In both new construction and tenant improvement projects, passive solar design strategies can greatly reduce the energy consumption of a building and increase user comfort and productivity. Passive solar heating in particular makes use of the building components to collect, store, and distribute solar heat gains to reduce the demand for space heating. Techniques for applying passive solar design include: daylighting work spaces with properly oriented and controlled windows; specifying high-performance glazing that reduces heat gain while admitting visible light; and incorporating adequate shading devices.

#### water conservation

Research shows that water consumption in commercial buildings can be reduced as much as 50 percent using a variety of innovative water conservation strategies. Simple strategies include the use of more efficient water fixtures, low flow toilets, waterless urinals, touchless faucets, and electric instantaneous hot water heaters.

## Strategy #5 : Efficient Lighting

### natural lighting conditions

Use natural daylighting by placing workstations near window openings or reflective surfaces so that natural daylight can provide the bulk of the interior lighting. Select light colored finishes that reflect daylight into the occupied spaces. This is a powerful way to maximize comfort and reduce energy use. Savings are recognized in the way of reduced artificial lighting, heating and cooling loads.

### energy efficient lighting

Lighting contributes a substantial amount of heat to the overall building, increasing the overall energy expenses as well as air cooling expenses in the summer months. To reduce the heat and overall cost of lighting, fluorescent and LED lamps provide the best options in tenant improvement projects. Existing T12 tubes and magnetic ballasts should be exchanged for the more energy efficient T8's and T5's and electronic ballasts. Use CFL's (compact fluorescents) in place of incandescent lamps. Add dimmers in decorative areas, where applicable and separate bathroom fans on separate switches from the lights.

### individual lighting controls

Consider using automated lighting control systems, dimmers or light and/or occupancy sensors as a way to further reduce energy use.

## Strategy #6 : Green Construction

### deconstruct rather than demolish

Although the freedom of applying the sledge hammer to a wall offers an immediate sense of empowerment and can be quite therapeutic; deconstruction and material salvage is a better solution. Deconstruction allows for parts of the building, such as framing lumber, cabinets and metal to be recycled or reused.

### construction waste management

Construction waste management techniques rely on salvage, recycling and reuse of materials and are proven to have economic benefits throughout construction and demolition. On-site recycling during construction and/or renovation will divert large amounts of landfill waste.

### job site management during construction

Protect HVAC systems from dust and other air pollutants with temporary covers on supply and return ducts. Prohibit the use of materials, such as adhesives, with high VOC content. Disallow gasoline or diesel powered equipment to be used on site.

work with as much of the existing structural system as possible

This reduces waste, time and money. Working within the structural core of the building, saves in the long run, by eliminating the need for additional engineering services and limiting the number of additional permits required.

improve the thermal envelope

Improving the thermal envelope can benefit both the building owner and tenant by eliminating energy leaks. These improvements can range from small to large; examples include replacement windows, replacement door fittings, adding or increasing insulation, modifications of exhaust vents, window casings, and masonry to reduce thermal bridging. Even patching small cracks in walls or gaps in vents can make a space more comfortable to work in and cut down on heating and cooling costs.

## Strategy #7 : Green Occupancy

purchase green power or install renewables

Make use of renewable resources to reduce waste and the overall deterioration of the environment. Renewable energy refers to electricity supplied from alternative sources, such as wind, solar, geothermal, hydro, and biomass. These energy sources are considered renewable because they are continuously replenished. Even if your business cannot install renewable resource technologies, you can purchase 'green power,' which is electricity generated from these renewable resources. This is an excellent way to protect the environment and encourage others to invest in renewable resources.

bring the outdoors in

Whatever your technique, strive for an interconnection between the inside and outside. It can be through introducing natural materials, textures and fibers within the material palette of the space, decorating with plants, letting in natural light or making use of windows and doors to frame views of the sky or green space.

share common space

Consider common shared spaces as an opportunity to pool resources, spur spontaneous conversations and create community. While not every office is designed as a collaborative workspace with shared conference rooms, kitchen, bathroom, garden and storage facilities; many offices can reduce expenses by sharing amenities such as restrooms.

support green office practices

Substantial amounts of resources, including materials and energy are used to support work processes and systems within the workplace. Developing office recycling and conservation practices can save money and divert waste. In addition to utilizing appropriate recycling bins in the office, small measures such as printing double sided, bringing lunch in reusable containers, sharing magazines and using a mug rather than a paper coffee cup when going to the local coffee shop, can drastically reduce waste.

## Why Should You Care?

Every choice you make has consequences to our planet. As outlined in this article, green tenant improvements can result in lower operating costs, improved worker health and productivity, efficient energy use and space that is better utilized. Best of all, building green creates a positive reputation for your company in the community. Lead by example and support green office practices which incorporate recycling, waste reduction and healthful workspace habits which contribute to a greener, safer world.

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