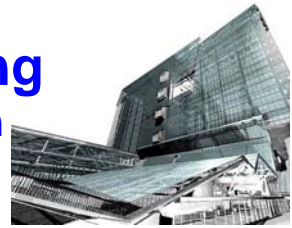




## San Francisco Federal Building GSA's Model of Sustainable Design



The San Francisco Federal Building is a reflection of GSA's commitment to design excellence and sustainable architecture. Built to stand the test of time, like the James F. Browning Federal Courthouse across the street that was built in 1905, the San Francisco Federal Building reflects the most innovative technology of our time and is built to serve its tenants and the community well into the next century.

As part of its commitment to sustainable living, GSA works to reduce consumption of resources, minimize waste and create a healthy and productive work environment for all tenants who occupy federal workspace. The San Francisco Federal Building is a demonstration of this commitment, incorporating state-of-the-art technology and innovation at every turn. Tenants of the San Francisco Federal Building will enjoy breathtaking views, as well as an abundance of natural light and natural ventilation that encourage a healthy work environment while dramatically reducing energy consumption.

The new federal building is a thin and elegant 234-foot-high by 65-foot-wide tower rising 18 stories along the northern edge of the Mission and Seventh Street site. A four-story building annex projects from the tower at the western edge of the site, perpendicular to Mission Street. The site also includes a number of resources that are available for public use, including: a café, a childcare center, an auditorium and conference center, a public plaza.

Large and flexible floor plans with power and data cabling conveniently routed through easily-accessible, under floor space makes workspace reconfiguration easy while reducing costs for remodeling.

### **HVAC**

Throughout the year, San Francisco temperatures range between 49 and 65 degrees. The new San Francisco Federal Building takes full advantage of the mild temperatures to provide a comfortable interior environment while reducing energy consumption.

Above the fifth floor, the windows automatically adjust to admit fresh air that is circulated through the building to promote healthy ventilation. The window system creates a "living skin" that allows the building to breathe.

A computerized system, known as the building automated system (BAS), manages the building's interior environment and lighting. To adjust the temperature, the computer system opens and closes windows and sunscreens. Breezes are admitted through openings on the northwest side and vented out through the southeast wall. The building

also has a small conventional heat and cooling system as well as windows that can be opened and closed manually in tower locations above the 5<sup>th</sup> floor.

Office space is designed to maximize airflow. Enclosed offices and meeting rooms are located in the interior spine of the building and have ceilings that allow air to flow over them.

The sunscreen is a perforated metal shield to reduce sunlight and heat. As the building heats up from the sun, the screen closes channeling the heat upward and creating a “chimney” effect that draws hot air out of the building.

During the night, BAS opens the windows to flush out heat build-up and allow the nighttime air to cool the building's concrete interior. Throughout the day the exposed concrete pillars and wave-form ceilings help cool the air circulating through the building.

Nationally, GSA strives to use no more than 55,000 Btu of energy per square foot per year in all its buildings. Most federal buildings use about 69,000 Btu. Remarkably, the new San Francisco Federal Building is expected to require only 27,000 Btu per square foot per year. The savings roughly equates to enough energy to power about 750 homes and is expected to qualify for a \$150,000 energy savings award from PG&E.

## **Electrical**

Lighting is typically the largest energy cost for an office building representing up to 40 percent of a facility's total energy load. The new San Francisco Federal Building's lighting strategies improve the workplace and are a critical facet of this project's sustainable design. Eighty percent of the workspace is illuminated with natural light.

Ambient light, the general illumination in an office, comes from sunlight channeled through the windows and bounced off the walls and ceiling to extend its reach with minimum glare and intensity.

The overall ceiling height in the tower floors is 13 feet, 10 feet in the interior offices, allowing light to penetrate deep into work spaces. Powered lights are also available and support the sun's energy. The building's automated system manages the balance between powered and natural daylight. The powered lights are on only when people are at their workstations. Together, these approaches cut the use of energy for lighting by apx. 26 percent.

## **Building Materials**

The concrete used for construction of the building is a 50 percent slag-concrete mix. Use of slag, which is a bi-product of iron, results in a material that is actually stronger than concrete alone. This environmentally sound choice also provides the warm, light colored tones designers were looking for since much of the material is visible throughout the structure.

Carpet, paint and items such as furniture were carefully considered with respect to the project's sustainable goals. GSA mandated that 75 percent of materials used during construction be recycled. Currently the project is recycling 87 percent of waste material.

### **Work Environment**

The building's interior is designed to create a healthy and productive work environment. The tower's high ceilings and glass facades provide 90 percent of the building's tenants with views overlooking the city.

The primary elevators stop at every third floor, opening to sky lobbies that promote exercise through use of a dramatic central staircase. These lobbies also provide a comfortable setting for informal meetings or discussions. A handicap accessible elevator that travels to every floor is also available.

The outer perimeter of the tower floors is configured with open offices and 52- inch-high partitions to maximize light. Meeting rooms and enclosed offices are located in the middle "spine" of these floors and have fritted glass panels to provide privacy when needed.

### **Leadership in Energy and Environmental Design (LEED) Rating**

Managed by the U.S. Green Building Council, LEED's Green Building Rating System is the nationally accepted benchmark for the design, construction, and operation of high performance green buildings. LEED's whole-building approach to sustainability recognizes performance in five key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality. Certification is awarded one year after occupancy.

Even though the new San Francisco Federal Building was designed five years before the LEED Certification System was established, it is still considered by many to be the benchmark for sustainable building design.

### **Quality Control**

Three independent systems are used to check and verify that the building is meeting energy conservation goals. Energy use will be monitored by the GSA Energy Center and compared with conventional federal buildings and the project's goals. To verify sustainability, the project is registered with the LEED program. The project team and GSA's Office of Applied Science has allied with a number of academic researchers to verify workplace productivity strategies. Among them: Lawrence Berkeley National Laboratory, Carnegie Mellon University's Center for Building Performance and Diagnostics, and the University of California Berkeley, Center for the Built Environment.

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