Green Building Guidelines

for the Rehabilitation of Historic & Non-Historic Buildings

DRAFT as of 4/18/02

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Introduction to Sustainable Design & Green Building Concepts

Introduction

Building rehabilitation, by its very nature, is an inherently sustainable practice. Existing structures represent energy that has already been expended, materials that have already been mined or harvested, components that have already been manufactured — the embodied energy of past generations. Therefore, reusing existing buildings rather than constructing new buildings provides the opportunity to meet real estate needs while conserving resources and preserving open space.

The intent of these guidelines is to provide a baseline for sustainable design and construction that all building rehabilitation at the Presidio must meet.

The five environmental categories that the guidelines are broken into represent the important environmental issues necessary for a holistic building evaluation. Under each category is a set of specific guidelines for teams to adopt — some guidelines are required, others are voluntary. The required elements are identified as "Requirements" and are conditions of the permit process. Voluntary guidelines are listed as "Opportunities" and represent feasible options to increase the environmental sensitivity of the project.

Design teams are strongly encouraged to incorporate as many "green" design initiatives into their projects as possible. The Presidio is striving to become a model of sustainability. Designing for optimum efficiency, performance, and sensitivity will help the Presidio meet this challenge and ultimately become a place of learning and innovation.

These guidelines represent minimum standards for rehabilitation projects in the Presidio. As further applicable U.S. Green Building Council approved rating systems become available, i.e. LEED *Commercial Interiors*, LEED 2.0, and LEED *Existing Building* (draft) will be provided as reference resources for further explorations of sustainable design.

Using This Document

The Presidio Trust Green Building Guidelines have been designed to introduce general topics of "green building" and to ultimately provide guidance through the process of successful permit submission to the Presidio Trust permitting office. Each of the five categories in this document contains background information on the intent of the specific requirement and details information needed complete the accompanying submittal, if applicable. Blank submittal forms are included at the end of each categorical section. Electronic copies of the submittal forms are also available from Presidio Trust project staff. The "Green Fact Sheet" beginning on Page 9 should be used to keep track of requirements, submissions, and sustainability opportunities applicable to specific projects. This checklist will eventually be included in the permit submission.

Balancing Historic Preservation & Sustainable Design

Every historic building is unique in terms of its potential for sustainability. Each building should be evaluated for historic features that must be preserved, and for the opportunities and constraints those features provide for improved performance. In many cases, a historic building's features are more efficient than later modifications to the building. For example, original operable windows provide natural ventilation and cooling, while newer technologies, such as ventilating systems, consume energy to operate and require more specialized maintenance.

GREEN DESIGN

"Green building" or "green design" is a design strategy that uses the concept of "sustainability" as a bench mark and recognizes that every design decision has an impact on the natural and cultural resources of not only the local environment, but also regional and global environments. It embraces the concept that human civilization is an integral part of the natural world and, as such, has a profound effect, for good or ill.

While there is no one single definition of sustainability, the following are its main principles. Sustainable design:

- Respects and responds to the unique characteristics of each site while recognizing the interdependence of the entire planet;
- Conserves energy both by minimizing the energy used in the construction process, as well as by specifying energy-efficient systems, fixtures, appliances and controls, and by maximizing natural daylighting within the building;
- Uses environmentally responsible materials that are less toxic, made with recycled materials, manufactured with low embodied energy, and come from renewable, salvaged, and certified sustainable sources;
- Conserves water by reducing consumption and by reclaiming and reusing water, when possible;
- Provides a healthy environment by reducing or eliminating the use or release of toxins and pollutants; and,
- Reduces or eliminates waste by reducing consumption, reusing materials and recycling, and designing for flexibility to reduce the waste generated from future remodeling.

HISTORIC PRESERVATION

"Rehabilitation," as defined by the *Secretary of Interior's Standards for the Treatment of Historic Properties*, assumes that some degree of repair or alteration to existing buildings (and/or sites) is required for efficient contemporary use. However, such modifications must not damage or destroy the character-defining features of the building or site.

The Presidio of San Francisco was designated a National Historic Landmark in 1962. More than half of the existing Presidio buildings are historically significant, and contribute to the Presidio's landmark status. These buildings must be preserved and rehabilitated in accordance with the *Secretary of Interior's Standards for the Treatment of Historic Properties* (1992). *The Guidelines for Rehabilitating Buildings at the Presidio of San Francisco* (1995) is also recommended as a supplemental document for historic rehabilitation. It is intended that this *Green Building Guidelines* document support and complement these two documents.

Compliance with federal regulations is necessary in all federally-owned historic buildings. Hence, with national historic preservation laws, the preservation of the historic character of existing Presidio buildings will take precedence over some sustainable design strategies that might otherwise be employed in the rehabilitation of existing buildings. This document has been developed with these specific historic preservation goals in mind. It is intended that the design team comply first with the *Secretary of Interior's Standards for the Treatment of Historic Properties*, and then with actions listed in this document.

DESIGNING FOR FLEXIBILITY

Capitalizing on existing efficient features and designing for long-term flexibility are important issues that should consistently inform design decisions throughout the project. Rehabilitation projects that allow buildings to "learn" by easily adapting over time not only use fewer resources now, but leave a legacy of adaptability. By using existing building features as fixed criteria that govern design decisions, a current use will not require substantial resources to accommodate changes in space-planning configurations.

If a space was historically open, use caution when including fixed demising walls that will reduce daylight penetration and obstruct ventilation.

The original architects of the historic Presidio buildings designed sturctures that limited reliance on electric light and utilized natural ventilation. Taking these elements into account potentially allows for both the downsizing of air handling equipment as well as maximizing the efficiency of lighting systems. Operable exterior windows coupled with interior transoms are ideal for passive air circulation and reduce mechanical system costs by minimizing penetrations required for duct work, and by promoting independent occupant control.

The Role of Cost in Design Decisions

FIRST COST

Frequently, design decisions are based on the first costs of materials. While this is useful in determining a project's construction cost or in comparing otherwise similar products, basing design decisions on first costs overlooks most, if not all, of the considerations involved in making successful design decisions.

LIFE CYCLE COSTING

Life cycle costing is a method for figuring the costs of a building over its "life". Life cycle costing considers the operational , replacement, and disposal costs of materials, in addition to first costs. The use of this costing method often justifies the use of materials with higher first costs when their operational costs are lower than comparable products, when they do not require as frequent replacement, or when other factors such as lower disposal costs come into play. Life cycle costs, however, still overlook many of the considerations involved in making sustainable design decisions.

Since the buildings at the Presidio are owned by the federal government, and building leases may be for terms longer than twenty years, it is appropriate to consider a longer than customary period when applying life cycle cost analysis to Presidio buildings. For commercial buildings, 50 years or the term of the lease should be used, whichever is greater. For residential buildings, 40 years should be used.

ENVIRONMENTAL COST

In addition to considering the dollar costs of design decisions, "green" building involves considering the environmental and social costs of design decisions. While dollar costs can be determined for some of the environmental and social costs, many of the impacts cannot readily be assigned dollar values, due to lack of quantifiable data.

The designer should be aware of the range of considerations involved and keep environmental and social issues in mind throughout the entire project. For example, when selecting a product, the issues to consider include:

- What is the product made of? Where do the raw materials for the product come from, and what is the environmental impact of its extraction or harvesting? Are the raw materials renewable or finite resources?
- What kind of processing is involved with turning raw materials into the finished product? What kind and how much energy is used during the processing and which by-products, including pollution and toxins, are generated?
- How are raw materials transported to the processing location and how are finished products transported to their place of use? What kind and how much energy is used during transport? What by-products (pollution) are generated?
- Which processes are required for the installation of the product? What kind and how much energy is used during installation? Are there any health or pollution concerns involved with the installation process?
- Which processes are involved with the operation and maintenance of the product in place? What kind and how much energy is used? Are there any health or pollution concerns involved with the product's operation and maintenance?
- What happens to the product at the end of it's life? Can it be reused or recycled? What kind and how much energy, including transportation energy, is required in disposing of or reconstituting the product? Are any potential toxins created by the disposal of the product?

All construction activities have adverse impacts associated with them. As the architect undertakes this process of design decision evaluation, oftentimes no clear correct answer will emerge, and the trade-offs between impacts must be compared. Developing a matrix to compare materials is an effective way of evaluating attributes and impacts. Ultimately, selecting a material compatible with environmental goals, project aesthetic criteria, and budgetary allotments is left up to the best judgment of the designer.

COST SYNERGIES OF SUSTAINABLE DESIGN DECISIONS

When considering either the dollar costs or the environmental and social costs of design decisions, it is important to consider the project as a whole, and not the individual design decisions. In truly sustainable design, there is often a synergy between individual design components that makes the project work well as a whole, even though the individual design decisions may not have seemed to work as well when looked at individually.

A simple example of the principle of synergy is a project involving the selection of windows, lighting, and HVAC equipment. In looking at the life cycle cost of the most energy-efficient windows, even with the downsizing of the HVAC equipment allowed by the use of the windows, the higher first costs of the windows may still not be justifiable. Likewise, when looking only at the life cycle costs of using the most efficient lighting system, the high first cost of the lighting may not

be offset sufficiently by the energy saving. However, when taken together, the efficient lighting system may also produce less heat and allow further downsizing or elimination of the cooling component of the HVAC system. The savings resulting from that further downsizing of equipment may suddenly make the higher first costs of both the windows and the lighting system fully justifiable. (Given the temperate climate of the San Francisco area, cooling for non-critical areas is prohibited in Presidio buildings.)

The Building Permitting Process from a Sustainability Perspective

PLANNING PHASE

During this phase, RFQs are issued seeking tenants whose spatial and programmatic needs fit the building's size, spatial configuration, massing, traffic, and utility. This fit is an important one and supported by the *Secretary of Interior's Standards and Guidelines for Rehabilitating Buildings* at the Presidio of San Francisco. The sustainability value of an existing building should be maximized by meeting the needs of its tenants and residents with as little reconstruction as possible.

SCHEMATIC DESIGN PHASE

The focus of the Schematic Design Phase is to identify the project's environmental opportunities as well as set goals such as establishing an overall Building Energy Budget. During this phase design team members and tenants are educated about sustainable design objectives. Design solutions are investigated and analyzed; those which are not feasible are ruled out.

REFERENCE DOCUMENTS AVAILABLE IN THE PRESIDIO TRUST LIBRARY:

- *Final General Management Plan Amendment* (National Park Service document)
- *Guidelines for Rehabilitating Buildings at the Presidio of San Francisco* (National Park Service document)
- *Guiding Principles of Sustainable Design* (National Park Service document)
- *Historic American Building Survey Report*, Presidio of San Francisco
- *Presidio Vegetation Management Plan* (National Park Service document)
- *Cultural Landscape Treatment Guidelines* (National Park Service document)
- *Waste Minimization Checklist for Deconstruction and Demolition* (Presidio Trust document)
- *Construction and Demolition Waste Reduction Checklist* (Presidio Trust document)
- *Presidio National Register of Historic Places Registration Forms*

DESIGN DEVELOPMENT AND CONSTRUCTION DOCUMENTS

The focus of the Design Development and Construction Documents phase is to finalize design decisions and document them in construction documents and specifications. The specification should include general environmental information within CSI Division One and technical language within each CSI division outlining environmental performance of each product and project protocol.

REFERENCE DOCUMENTS:

- *Resourceful Specification* ,Larry Strain, AIA (available for reference in the Presidio Trust Green Building Resource Center).

CONSTRUCTION

During the Construction phase, the approved design is materialized in the physical world. The environmental priorities of this phase are construction waste reduction and providing good indoor air quality, through properly ventilation and materials installation sequencing. Also, it is important for the design team to be vigilant that all environmental products, practices, and design solutions, detailed in the documents and specifications, are implemented in the field.

REFERENCE DOCUMENTS:

- *Waste Minimization Checklist (*Presidio Trust document)

OPERATIONS AND MAINTENANCE

The intent of the Operations and Maintenance phase is to reduce the environmental impact of building operations through various means, such as:

- Operating HVAC systems efficiently
- Encouraging occupants to turn equipment off when not in use
- Reducing the amount of operational waste generated
- Using non-toxic cleaning products and methods
- Conserving water
- Recycling

Proper operations and regular maintenance is also important for long-lasting building elements and good indoor air quality. In the damp and foggy microclimate of the Presidio, regular and thorough cleaning of the various building elements is required to prevent growth of molds and fungi that can be detrimental to indoor air quality or that can deteriorate building materials.

Green Fact Sheet

Check off each requirement, submittal, or opportunity as they are fulfilled on the project. The numbers correspond to the listings in the text of this document.

REQUIREMENTS

- ☐ Requirement 1 – Existing sustainable features
- ☐ Requirement 2 – Site Protection Plan
- ☐ Requirement 3 – Transportation Management Plan
- ☐ Requirement 4 – Insulation
- ☐ Requirement 5 – Impermeable membrane
- ☐ Requirement 6 – Enhanced window features
- ☐ Requirement 7 – Cap unused chimneys
- ☐ Requirement 8 – California Title 24 for lighting
- ☐ Requirement 9 – HVAC
- ☐ Requirement 10 – High efficiency mechanical cooling systems
- ☐ Requirement 11 – California Title 24 for boilers
- ☐ Requirement 12 – Photocell-controlled compact fluorescent, HID technology
- ☐ Requirement 13 – LED exit signs
- ☐ Requirement 14 – Replace fluorescent/incandescent exit signs with LED
- ☐ Requirement 15 – No electric tank water heaters
- ☐ Requirement 16 – Recyclable storage
- ☐ Requirement 17 – Identify salvageable/reusable materials
- ☐ Requirement 18 – Consult Green Building Material List (attached) for structural/finish materials
- ☐ Requirement 19 – Type 6,0 carpeting
- ☐ Requirement 20 – No virgin old-growth/endangered wood
- ☐ Requirement 21 – Construction solid Waste Management Plan
- ☐ Requirement 22 – Identify CFCs, HCFCs, halons and plans for removal/replacement
- ☐ Requirement 23 – Thermal comfort requirements
- ☐ Requirement 24 – Door mats/ walk-off mats
- ☐ Requirement 25 – VOC-compliant sealants/adhesives
- ☐ Requirement 26 – Low-VOC interior paint

- ☐ Requirement 27 – Water-based, low-VOC wood floor finish
- ☐ Requirement 28 – CRI Green Label program-approved carpet
- ☐ Requirement 29 – HMMP, HMIS, MSDS
- ☐ Requirement 30 – Water Conservation Standard- compliant plumbing fixtures
- ☐ Requirement 31 – Lead free new plumbing fixtures
- ☐ Requirement 32 – Backflow prevention devices
- ☐ Requirement 33 – Low-flow toilets
- ☐ Requirement 34 – Low-flow urinals
- ☐ Requirement 35 – Low-flow showerheads
- ☐ Requirement 36 – Low-flow lavatory faucets
- ☐ Requirement 37 – Low-flow kitchen faucets
- ☐ Requirement 38 – Purple pipe wastewater recovery
- ☐ Requirement 39 – Presidio-approved plants
- ☐ Requirement 40 – Landscape compliant with *Presidio Vegetation Management Plan*
- ☐ Requirement 41 – Low-water-use irrigation, drip systems, timed sprinklers

SUBMITTALS

- ☐ Submittal 1 – Existing Features Checklist
- ☐ Submittal 2 – Site Protection Plan
- ☐ Submittal 3 – Transportation Management Plan
- ☐ Submittal 4 – Certificate of compliance with Title 24 for lighting, HVAC
- ☐ Submittal 5 - Certificate of compliance with Title 24 for boilers
- ☐ Submittal 6 – Construction Solid Waste Management Plan

OPPORTUNITIES

Check off any corresponding opportunities, detailing the project specifics in the space provided.

- ☐ Opportunity 1 – Rainy season work Erosion Control Plan _____
- ☐ Opportunity 2 – Carpooling/alternative fuel vehicle preferred parking _____
- ☐ Opportunity 3 – Bicycle parking _____
- ☐ Opportunity 4 – Bicycle storage _____
- ☐ Opportunity 5 – Shower & changing facilities _____

- ☐ Opportunity 6 – Minimize air & water penetration _____
- ☐ Opportunity 7 – Low-E window replacements _____
- ☐ Opportunity 8 – Energy Star-rated appliances & office equipment _____
- ☐ Opportunity 9 – Open-plan office design _____
- ☐ Opportunity 10 – VAV air distribution systems _____
- ☐ Opportunity 11 – VSD fan controls in VAV systems _____
- ☐ Opportunity 12 – Compatible automatic building control system _____
- ☐ Opportunity 13 – High-efficiency "fin" radiator replacements _____
- ☐ Opportunity 14 – Variable speed hot water/chilled water pumping systems _____
- ☐ Opportunity 15 – Evaporative cooling technology _____
- ☐ Opportunity 16 – High-efficiency boiler system _____
- ☐ Opportunity 17 – Ultra-high-efficiency combo boiler DHW heater _____
- ☐ Opportunity 18 – Occupancy sensors _____
- ☐ Opportunity 19 – Photocell-controlled fixtures _____
- ☐ Opportunity 20 – Automatic sweep controls _____
- ☐ Opportunity 21 – Electric point-of-use instant hot water heaters _____
- ☐ Opportunity 22 – Natural gas tankless hot water heaters _____
- ☐ Opportunity 23 – Integrated PV technology demonstration _____
- ☐ Opportunity 24 – Modular system wall construction _____
- ☐ Opportunity 25 – Leased office furniture _____
- ☐ Opportunity 26 – Materials reuse from Presidio Salvage Warehouse _____
- ☐ Opportunity 27 – 10% salvaged/reused materials _____
- ☐ Opportunity 28 – 20% regionally manufactured materials _____
- ☐ Opportunity 29 – Minimize materials packaging _____
- ☐ Opportunity 30 – FSC-certified framing/finish wood _____
- ☐ Opportunity 31 – Install wet/odorous materials before dry/sink materials _____
- ☐ Opportunity 32 – Replace filtration media _____
- ☐ Opportunity 33 – Specify HVAC system commissioning before occupancy _____
- ☐ Opportunity 34 – ventilation prior to occupancy _____
- ☐ Opportunity 35 – Agricultural-based formaldehyde-free boards _____

- ☐ Opportunity 36 – Low-VOC fasteners/adhesives _____
- ☐ Opportunity 37 – Low-VOC formaldehyde-free door/frame finishes _____
- ☐ Opportunity 38 – Natural fiber carpet _____
- ☐ Opportunity 39 – Natural linoleum _____
- ☐ Opportunity 40 – Appropriate housekeeping product storage _____
- ☐ Opportunity 41 – Waterless urinals _____
- ☐ Opportunity 42 – Temporary irrigation system _____
- ☐ Opportunity 43 – Area drainage inlet with sediment retention _____
- ☐ Opportunity 44 – Filtration type basket in catch basin _____
- ☐ Opportunity 45 – Absorption beds/runnels _____

Green Building Guidelines for Building Rehabilitation at the Presidio

I. Planning Sustainable Sites

A. Identifying Existing Sustainable Features

Requirement 1

Provide a pre-construction assessment that identifies and evaluates the existing building's energy conserving design features (e.g. passive solar, daylighting, and natural ventilation opportunities). In addition, obtain background information on the site and building to identify "lost" or removed historic building and site features which may add to the building's sustainable features. Reestablish or restore lost character-defining features that serve to enhance the building's energy-saving potential. (Refer to the Presidio Trust Library, National Park Service Archives.)

This process should consider:

- Solar orientation
- Thermal mass (e.g. brick, concrete)
- Insulation, if any
- Existing energy-efficient design features (e.g. porches, windows, sunrooms, awnings, cupolas, shutters, transoms, skylights)
- Original design features lost or removed over time
- Estimated percentage reliance on natural ventilation
- Estimated percentage reliance on daylighting
- Estimated percentage reliance on solar heat
- Existing exterior landscape, including circulation (e.g. walks, steps), vegetation, and exterior furnishings (e.g. benches, lighting), if applicable
- Existing site-drainage systems, if applicable

Submittal 1

Complete "Existing Features Checklist" form (attached) and submit with preliminary plan to Presidio Trust Permitting Office.

B. Site Erosion Control

Although erosion control and stormwater management are handled by broad-based Presidio planning initiatives, the Tenant/Design Team may still propose limited changes that could have impact on issues under this category. Such changes include, but are not limited to: construction disturbance, building additions, cut and fill, retaining wall work, rainwater recovery systems, replacement or creation of new circulation paths, drainage, irrigation installation, any gardening, lighting, or signage, ADA access ramps, entry modification, etc.

Opportunity 1

Avoid scheduling significant site work during the rainy season. When construction activities include soil disturbance where run-off of exposed soil could potentially impact storm water

systems during a precipitation event, submit a building-specific Erosion Control Plan, including mitigation strategy(s), and submit to The Presidio Trust Permitting Office. (Refer to *Presidio Trust Stormwater Management & Erosion Control Plan* for further information.)

C. SITE PROTECTION/RESTORATION

Requirement 2

Where applicable, implement a Site Protection Plan for topsoil and existing trees and vegetation and restore all existing cultural and historic landscape areas disturbed by construction on the site, unless any site changes were permitted through other stages of the design process. Minimize cut and fill requirements.

Dispose of any removals through the Presidio Trust Tree Recycling and Composting program. Contact Presidio Trust Compost and Regeneration staff for assistance.

Reference the Presidio Vegetative Management Plan and Secretary of the Interior's Guidelines for Rehabilitating Buildings at the Presidio of San Francisco.

Submittal 2

Complete Site Protection Plan with construction drawings and submit to the Presidio Trust Project Manager.

D. MANAGING/REDUCING TRAFFIC FLOW

Requirement 3

Submit a Transportation Management Plan to Presidio Trust Project Manager.

Submittal 3

Complete Transportation Demand Management Plan at occupancy.

Opportunity 2

If applicable, provide preferred parking for car pooling and/or alternative fuel vehicles.

E. ALTERNATIVE TRANSIT FACILITIES

Opportunity 3

Provide suitable and visible means, located at or near front entry, for securing bicycles for at least 5% of the building's regular employee population.

Opportunity 4

Provide designated, easily accessible, secure location for bicycle storage.

Opportunity 5

Where historically appropriate, install shower and changing facilities for cyclists employed within the tenant organization.

II. Improving Energy Efficiency

Although designers are strongly encouraged to explore creative avenues toward energy efficiency in building rehabilitation, certain basic and necessary steps are required to achieve the Presidio's

minimum standards for energy efficiency. Executive Order 060399, *Greening the Government through Efficient Energy Management*, also mandates that all federal facilities must reduce their energy consumption by 30% by 2005, though the Presidio Trust is committed to meeting this goal sooner than the target year.

A. BASELINE OPTIMIZATION OF EXISTING BUILDING ENVELOPE

Requirement 4

If in project scope, when any exterior walls are opened, install reversible, environmentally sound insulation, where possible. (Use blown-in insulation when appropriate.) Install thermal insulation and vapor barriers in attics, unheated cellars, and crawl spaces.

Requirement 5

If any site excavation is required during building rehabilitation that exposes new or existing basement wall construction, install impermeable membranes as appropriate to protect against air/moisture penetration.

Requirement 6

Especially with historic windows, consider possible additive procedures to enhance window energy performance in conjunction with window repair before considering replacement. Use mitigation methods for historic window systems that display poor performance: weather-stripping, interior storm windows, exterior storm windows, re-glazing where historically permitted, replacing non-historic glass panes with low-E glass, interior shading devices, solar film, etc.

Requirement 7

Cap unused chimneys with a reversible device to minimize heat loss, where applicable to project.

Opportunity 6

Minimize air and water penetration by using low-emitting sealant for caulking, proper weather-stripping around doors, and rubber gaskets to seal electrical outlets.

Opportunity 7

When existing windows require replacement or when installing new windows, install high-performance, low-E windows (e.g. Energy Star-rated windows).

B. BASELINE ENERGY EFFICIENCY

Requirement 8

Meet compliance requirements outlined in California's Title 24 codes for lighting and heating/cooling equipment, provided that compliance measures do not conflict with required historic preservation standards.

Submittal 4

Submit certificate of compliance for lighting, heating, and ventilating equipment to The Presidio Trust with permit plan set.

C. ENHANCED PLUG LOAD ENERGY EFFICIENCY

Opportunity 8

When purchasing new equipment, specify EnergyStar-rated appliances and office equipment, such as refrigerators and computer monitors.

D. NATURAL VENTILATION AND DAYLIGHTING

Opportunity 9

Encourage open-plan design for proposed offices to encourage daylighting and natural ventilation (e.g. modular furniture, low partition walls), retaining maximum open floor area within original building configuration. This strategy provides maximum means for natural ventilation of interior enclosed spaces through designing for cross-breezes.

F. ENERGY EFFICIENT AIR DISTRIBUTION SYSTEMS

Requirement 9

Unless in conflict with other code requirements, install only mixed air system designs with a minimum of 15 cfm of fresh air per occupant for any new mechanical HVAC equipment. All HVAC systems are required to have an economizer cycle.

Opportunity 10

Install variable air volume (VAV) air distribution systems where mechanical ventilation is required.

Opportunity 11

In all VAV systems, install variable speed drive (VSD) fan controls.

G. ENERGY EFFICIENT HEATING/COOLING SYSTEMS

For historic purposes, any new mechanical systems should take into account the construction configuration of the existing building and its layout, and the manner in which these mechanical systems are incorporated or attached in the building. Such measures will need to ultimately pass NHPA review.

Requirement 10

No mechanical cooling is to be used for comfort cooling unless required by code. When mechanical cooling systems are required by code or to protect equipment, use only high-efficiency cooling equipment.

Opportunity 12

Install an automatic building control system compatible with the Presidio Trust's Johnson Controls Metasys System, to provide at minimum: nighttime temperature setback/setup, scheduling control, optimized start/stop, and temperature reset for all major heating and cooling sources and their associated distribution pumps, and for all mechanical ventilation systems for the building.

Opportunity 13

When replacing radiators, use high-efficiency "fin" radiator systems. If existing, less efficient radiators are considered historically significant, but require supplemental heating, use low-profile "fin" radiator systems in compatibility with the existing radiator systems.

Opportunity 14

Employ variable speed hot water/chilled water pumping systems utilizing variable speed drives (VSD).

Opportunity 15

Use direct or indirect evaporative cooling technology in place of mechanical cooling systems.

H. Energy Efficient Boiler Technology

Requirement 11

Meet California Title 24 requirements for boilers.

Submittal 5

Certificate of compliance.

Opportunity 16

Install an automatic boiler control system that is compatible with the Trust's site-wide energy management system (Johnson Controls Medasys system). Install new, higher-efficiency boiler system with an efficiency between 80% and 90%.

Opportunity 17

Install ultra-high-efficiency combination boiler/DHW heater with greater than 90% efficiency.

I. Energy Efficient Lighting

Requirement 12

Specify photocell-controlled compact fluorescent or HID technology for exterior lights, in compliance with Title 24 mandate. At a minimum, specify photocell control for all exterior lighting controls. For interior lighting, specify either compact fluorescent lighting or low mercury, T-8/linear fluorescent lamps with electronic ballasts.

Requirement 13

Use light-emitting diode (LED) exit signs for all new installations.

Requirement 14

Replace/retrofit all existing incandescent or fluorescent exit signs with LED exit signs.

Opportunity 18

Install occupancy sensor controls in all office spaces, with the exception of corridor areas.

Opportunity 19

Install photocell-controlled fixtures for interior lighting control.

Opportunity 20

Install "automatic sweep" controls that will turn off all non-critical lights at a certain hour.

J. ENERGY EFFICIENT DOMESTIC HOT WATER TECHNOLOGIES

Requirement 15

Do not use electric tank water heaters.

Opportunity 21

Install electric point-of-use instant hot water heaters for kitchen or lavatory sinks.

Opportunity 22

Install natural gas tankless ("instant") water heaters.

K. RENEWABLE/ALTERNATIVE ENERGY

Opportunity 23

When permitted by historic standards, install a demonstration model of integrated photovoltaic technology.

III. Conserving Materials & Resources

A. STORAGE/COLLECTION OF RECYCLABLES

Requirement 16

Provide ground-floor location for collection and storage of separated recyclables, including glass, plastic, and aluminum beverage containers, paper, and cardboard.

B. FLEXIBLE BUILDING TYPES

Buildings that employ adaptable and flexible construction and furnishings represent a sustainable practice. The more flexible a building's layout and furnishings, the more embodied energy is saved when changes are required within the building. Using flexible or moveable building systems also meets historic preservation criteria for reversibility.

Opportunity 24

To encourage long-term building flexibility, employ modular systems for new wall construction, with an emphasis on flexibility and moveability, while maintaining preservation practices for existing historic construction.

Opportunity 25

To maintain building's functional flexibility over time, lease, rather than purchasing, flexible office furniture and furnishings.

C. RESOURCE REUSE

Requirement 17

Identify materials such as doors, windows, hardware, bricks, sinks, and equipment to be salvaged or reused. Contact Presidio Salvage Crew to identify materials that can be reused.

Opportunity 26

Register with Presidio Salvage Warehouse to check for on-site salvaged architectural materials relevant to the existing building's period of historical significance. Specify the reuse of existing doors and other architectural elements, if possible.

Opportunity 27

Specify salvaged or refurbished furnishing material for 10% of total building materials cost.

D. Environmentally Preferable Construction Materials

Requirement 18

Consult the Presidio Trust Green Building Material List when specifying structural and finish materials.

Requirement 19

Specify the use of type 6.0 nylon carpeting. Please see Presidio Trust Green Building Materials Library for samples and information.

Requirement 20

Do not use any virgin old-growth or endangered wood products.

Opportunity 28

Use a minimum of 20% of building materials that are regionally manufactured (within 500 air miles of the Presidio), or collect materials from the Presidio Salvage Warehouse.

Opportunity 29

In all purchasing of materials, specifically request minimal, recycled, and/or recyclable packaging for all products.

Opportunity 30

Specify FSC-certified sustainably-harvested wood for framing and finish

E. Construction Waste Management Plan

Requirement 21

Submit a Construction Solid Waste Management Plan to the Presidio Trust Permitting Office.

Submittal 6

Submit Construction Solid Waste Management Plan with construction drawings at the time of permit submittal.

F. Elimination of CFCs/Halons

Requirement 22

Identify on a list provided to the Presidio Trust any existing HVAC or refrigerant equipment containing CFCs, HCFCs, or halons, and outline plans for its removal/replacement. When installing any new systems, specify only HVAC/refrigeration equipment that is free from CFCs or HCFCs, and fire suppression equipment that is free from CFCs or halons, AND specify and

use building materials (e.g. insulation, carpet pads) that are free from CFCs or HCFCs as foaming agents or other parts of manufacturing process.

IV. Enhancing Indoor Environmental Quality

A. Baseline Thermal Comfort

This guideline calls for a baseline "code" for thermal comfort in all Presidio buildings. The Presidio follows outside design conditions as outlined in the ASHRAE *Handbook of Fundamentals*, and inside design conditions as outlined in ASHRAE *Standard 55-1992* and DOE *Design Criteria Manual 6430.1*.

Requirement 23

Ensure that inside design conditions meet thermal comfort requirements of 76°F for cooling and 72°F for heating. Design for outside design conditions of 77°F DB and 63°F WB in summer and 38°F WB in winter.

B. Construction IAQ Management

IAQ problems caused by construction may be due to dust created by the disturbance of building materials and systems during renovation or demolition; emissions of volatile organic compounds (VOCs) from materials and products; or emissions of combustibles and VOCs from construction equipment or construction processes. (For further reference, see SMACNA's *IAQ Guidelines for Occupational Buildings Under Construction*.)

Requirement 24

In all existing building entryways, install doormats both on porches and inside building entryways to catch and hold particles to keep them from contaminating the building's interior. In any *new* building entryway design a permanent architectural entryway (e.g. depressed floor mats, grills, or grates).

Opportunity 31

Specify installation of wet and/or odorous work before dry/sink materials.

Opportunity 32

Replace all filtration media prior to occupancy.

Opportunity 33

Specify HVAC system commissioning according to ASHRAE Guideline 1-1989 "Commissioning of HVAC Systems" *before occupancy, for buildings larger than 20,000 square feet.*

Opportunity 34

Provide for 100% outside air ventilation (or maximum achievable) for 24 hours/day 2 to 4 weeks prior to occupancy.

C. Low-VOC Materials

In general, minimize use of carpet as a floor finish material. Carpet acts as a "sink," absorbing dirt and VOCs, only to re-emit them later. The backings and adhesives used in carpeted finishes are

also sources of VOCs. *See LEED standards for IAQ criteria on individual materials. See Presidio Trust Green Building Library.*

Requirement 25

Specify all sealants and adhesives based on Bay Area Air Quality Management District, Regulation 8, Rule 51 for VOC emission levels and architectural coatings based on Regulation 8, Rule 3. *(See web site at http://www.baaqmd.gov for levels.)*

Specify carpeting adhesive methods that use one of the following:

- "Stretch and Tack", if impacts on sub-flooring are acceptable to the Presidio Trust, OR
- Dry adhesive methods, OR
- Water-based adhesives where glue-down installation is required.

Requirement 26

Specify VOC content of less than 100g/liter for all interior painting.

Requirement 27

For wood floors, specify water-based finishes with a low VOC content.

Requirement 28

Use carpeting that carries the Carpet and Rug Institute (CRI) Indoor Air Quality label.

Opportunity 35

Specify agricultural-based, formaldehyde-free boards in place of conventional fiberboard or particle board products. For plywood, minimize out-gassing from plywood glues. *See Presidio Trust Green Building List.*

Opportunity 36

Specify fasteners and adhesives with VOC content below 50g/l, that contain no formaldehyde, and which meet the requirements of the manufacturer of the products involved. *(From the standards set forth in EPA Region 10's building renovation in Seattle.) See Presidio Trust Green Material Resource Sheet.*

Opportunity 37

For door and frame finishes, use water-borne, formaldehyde-free polyurethane with total VOC content below 200g/L.

Opportunity 38

If using synthetic carpet, specify natural fiber (vs. synthetic) carpeting or carpet padding.

Opportunity 39

Specify natural linoleum in lieu of vinyl where resilient flooring is used.

D. CHEMICAL STORAGE AREAS

No storage of flammable or combustible liquids is allowed without the prior written permission of the Presidio Trust. When permitted, the quantity of materials, listed cabinet, and location must be approved in advance.

Requirement 29

Submit a Hazardous Materials Management Plan (HMMP), Hazardous Materials Inventory Statement (HMIS), and Materials Safety Data Sheets (MSDS) for all chemicals, flammable/combustible liquids, oils, lubricants, fuels, and gases to be maintained and updated regularly, and submitted to the Presidio Trust Fire Department within 90 days of occupancy.

Opportunity 40

Provide any storage for housekeeping products to allow for secure product storage in spaces that have: (1) water in chemical mixing areas; (2) drains for appropriate disposal; (3) separate outside venting; and (4) negative pressure.

V. Safeguarding & Conserving Water

The Presidio Trust mandates investment in the capital improvement of plumbing fixtures. These improvements shall consist of the replacement or retrofit of older inefficient units with new low-volume units. Where replacement of fixtures is economically unfeasible, operational modifications or flow-regulating devices shall be employed. Cost effectiveness is defined by the "Energy Efficiency and Water Conservation at Federal Facilities" amendment, Executive Order 12902, as "providing a payback period of less than 10 years." The cost of a water management option must be repaid in water, waste water treatment, and distribution energy costs within 10 years. This "cost-effectiveness" is determined by life cycle cost analysis developed in pursuant to 42 U.S.C. 8254 and 10 CFR 436.

The Presidio Trust mandates that water management options beginning with unit replacement be documented. In the event that a replacement is not cost-effective, retrofitting or operational modifications shall occur. In reference to water-conserving fixtures, items C through F offer sanctioned modifications.

A. Baseline Water Conservation

The purpose of this guideline is to require a minimum standard for water-conserving fixtures in all buildings. (*Need to articulate minimum standards.)

Requirement 30

Specify new plumbing fixtures that are, at minimum, compliant with the State of California Water Conservation Standard adopted in accordance with the Federal Energy Policy Act 1992.

B. Baseline Water Quality

The Presidio Trust Water Treatment Plant currently meets or exceeds the requirements of the California Safe Drinking Water Act.

Requirement 31

Specify all newly supplied plumbing fixtures to be lead-free.

Requirement 32

Install backflow prevention devices on any system that can have potential effects on water quality (e.g. boilers, air handling coolers, hose bibs, irrigation systems, etc.)

C. WATER-CONSERVING TOILETS

Requirement 33

Replace or retrofit existing toilets so that water consumption does not exceed 1.6 gpf.

- When retaining inefficient gravity flow toilets, EITHER adjust flush valves to reduce water consumed per flush, OR install displacement devices, toilet dams, and early closure devices.
- When retaining inefficient existing flush valve toilets, EITHER adjust flush valves to reduce water consumed per flush, OR install early closure devices, insert or valve replacement devices, or infrared sensors.

D. WATER-CONSERVING URINALS

Requirement 34

Replace or retrofit existing urinals so that water consumption does not exceed 1.0 gpf.

- On siphonic jet urinals, adjust/retrofit flushometer valves and/or install timers to automatically remove accumulated wastes on siphonic jet urinals.
- On washout or washdown urinals, install infrared or ultrasound sensor-activated controls on washout or washdown urinals.

Opportunity 41

Install waterless urinals.

E. WATER-CONSERVING SHOWERHEADS

Requirement 35

Replace or retrofit existing showerheads so that water consumption does not exceed 2.5 gpm at 80 psi.

- Adjust flow valves to reduce water flow AND/OR install flow restricters on all conventional showerheads.
- Use metered units when installing any public showers.

F. WATER-CONSERVING FAUCETS

Requirement 36

For all lavatory faucets, replace or retrofit existing fixtures so that water consumption does not exceed 2.2 gpm at 60 psi (equivalent to 2.5 gpm at 80 psi).

Requirement 37

For all kitchen faucets in public facilities, replace or retrofit existing fixtures so that water consumption does not exceed 2.2 gpm at 60 psi.

- On manual valve faucets, EITHER retrofit faucet by installing flow restricters or aerators, OR adjust flow valve to reduce water flow where not economically feasible.
- On metered valve, low-flow faucets, adjust flow valve to reduce water flow.
- On self-closing low-flow faucets, adjust flow valve to reduce water flow.

G. Water Recovery System

The Presidio Trust is currently developing plans for a wastewater reclamation and treatment plant to provide water for irrigation. All recycled water systems must be compliant with California Title 22 Health Laws Related to Recycled Water.

Requirement 38

In any new construction or rehabilitation involving exterior plumbing work and/or requiring irrigation, use *only* purple pipe for future wastewater recovery use by the Presidio.

H. Water-Efficient Landscaping

Requirement 39

To minimize water use in site landscaping, use only Presidio-approved plants that are: (1) non-invasive; (2) drought-tolerant; and (3) low-maintenance.

Requirement 40

Ensure that any landscaping/irrigation is consistent with the *Presidio Vegetation Management Plan*.

Requirement 41

Specify only low-water-use irrigation, drip systems, and timed sprinklers for night watering.

Opportunity 42

Install a temporary irrigation system that is removed once plant establishment period is complete.

I. Surface Runoff Filtration and Reduction

In general, retaining as much surface runoff as possible on site is a sustainable practice and should be encouraged. Use of permeable surfaces and reduction of surface runoff should be pursued carefully, but when changing any on-site water retention patterns, cautious attention must be paid to issues of flooding (especially basements). In addition, any proposed changes to the site or its landscaping must be in keeping with the historic and cultural fabric of the site, along with any applicable codes and standards.

Opportunity 43

Install area drainage inlets with sediment retention capacity.

Opportunity 44

Install a filtration-type basket in catch basin.

Opportunity 45

Install absorption beds or "runnels" (e.g. rock, sand, cobble, etc.) under the building's gutter and downspout discharge locations, as historically appropriate, to encourage on-site rainwater retention.

Resources

Presidio Resources

Presidio Trust Library has a small, but valuable sustainable development collection including product reference and international accounts. The library is accessible in Building 34 on the first floor.

Presidio Trust Librarian, 415-561-5343.

Green Building Library contains guidelines, specifications, as well as product samples of interior and exterior building materials. The library is accessible in Building 1750.

Presidio Trust Sustainability Coordinator, 415-561-5368.

Presidio Salvage Warehouse holds items ranging from office supplies to tools to lumber. The inventory tends to vary depending on current projects in the park. Call to discover what is available or for consultations on salvaging during deconstruction. The warehouse is accessible in Building 1263.

Presidio Trust Salvage Supervisor, 415-561-4260.

Presidio Recycling Center is the main recycling depository in the park. Presidio Trust and San Francisco Community Recyclers coordinate collection of paper, cardboard, glass, plastic and aluminum for all tenant offices. Call for information on collection, recycling of other materials and recycling during deconstruction.

Presidio Trust Sustainability Coordinator, 415-561-5368.

San Francisco Community Recyclers, 415-731-6720.

Presidio Composting Program can provide consultation and technical support for implementing composting at tenant sites as well as offer volumes of productive compost for use in landscaping.

Presidio Trust Compost Technician, 415-561-4278.

Presidio Trust Hazardous Materials Department supply expertise and support on the logistics of hazardous waste disposal, such as lead and asbestos removal.

Paul Martin, Presidio Trust Waste and Materials Coordinator, 415-561-4283.

Health and Safety Manager, 415-561-5193.

Rebuild Presidio is a branch of the Department of Energy's Rebuild America, a program which facilitates the implementation of energy-saving technologies through community partnerships and profitable investments. Ongoing education and technical support is available to tenants of the Park.

Trust Energy Manager 415-561-4195.

Other Resources

For further resource information, see the bibliographies and links in the resources listed below. The web site at http://www.ebuild.com/Biblio/Biblio.html is also a reference source.

GENERAL SUSTAINABLE DESIGN INFORMATION

Books

Barnett, D. and W. Browning (1995) *A Primer on Sustainable Building*, Rocky Mountain Institute.

United States Department of the Interior, National Park Service (1993*) Guiding Principles of Sustainable Design.* (available on the Internet at www.nps.gov/dsc/dsgncnstr/gpsd)

Marinelli, Janet and Paul Bierman-Lytle (1995) *Your Natural Home*, Little, Brown and Company

Web Sites

Building Environmental Science and Technology, http://www.nrg-builder.com/greenbld.htm

Center for Renewable Energy and Sustainable Technology (CREST), http://www.crest.org

E Build, http://www.ebuild.com

E Design Online, http://edesign.state.fl.us/

Greening Federal Facilities Resource Guide, http://www.eren.doe.gov/femp/greenfed/

Lawrence Berkeley National Laboratory Center for Building Science, http://eande.lbl.gov/CBS/CBS.html

National Park Service Information Directory, http://www.nps.gov/sustain/

US Department of Energy Center for Sustainability, http://www.sustainable.doe.gov/

Periodicals

Environmental Building News (see E-Build web site for subscription information)

BUILDING MATERIAL SELECTION AND PRODUCT LISTS

Books

American Institute of Architects, *AIA Environmental Resource Guide*, Demkin, J.A., Ed., John Wiley & Sons, New York, NY, 1996.

The Center for Resourceful Building Technology, *Guide to Resource Efficient Building Elements.*

Kibbey, David, ed. *Architectural Resource Guide*, Northern California Chapter of Architects/Designers/Planners for Social Responsibility.

Patterson, Doug and Walsh, Valerie eds. *Environmental Building News Product Catalog*, E Building, Inc. Brattleboro, VT.

Schomer, Victoria, *Interior Concerns Resource Guide*, Interior Concerns Environmental Resources, Inc, Mill Valley, CA, 1994.

Strain, Larry, *Resourceful Specifications*, Siegel & Strain Architects.

Web Sites

REDI Guide, http://www.oikos.com/redi/index.html

Good Wood, http://www.good.wood.org

CONSTRUCTION WASTE

Books

Kincaid, Judith, Cheryl Walker and Greg Flynn (1995) *WasteSpec, Model Specifications for Construction Waste Reduction, Reuse and Recycling*, Research Triangle Park, North Carolina: Triangle J Council of Governments.

Minnesota Office of Environmental Assistance, *Construction Materials Recycling Guidebook*, Educational Clearinghouse, St. Paul, MN, 1993

San Francisco Recycling Program, *San Francisco Directory of Recycling Services - Construction & Demolition Debris*, City & County of San Francisco.

Web Sites

California Integrated Waste Management Board, *Construction and Demolition Recycling*, http://www.ciwmb.ca.gov/ConDemo, (916) 255-2149

DESIGNING FOR FLEXIBILITY

Brand, Stewart, How Building Learn, R.R. Donnelley & Sons, 1994

ENERGY CONSERVATION

Web Sites

Energy Efficiency and Renewable Energy Network, US Department of Energy, Office of Building Technology, http://www.eren.doe.gov/buildings/

Energy Star Programs, 1-888-STAR-YES, http://www.epa.gov/energystar

Federal Energy Management Agency, http://www.eren.doe.gov/femp/

Florida Solar Energy Center, http://www.fsec.ucf.edu/

Residential Energy Efficiency Database, http://www.its-canada.com/reed/

INDOOR AIR QUALITY

Web Sites

Bay Area Air Quality Management District, http://www.baaqmd.gov

HISTORIC PRESERVATION AND THE PRESIDIO OF SAN FRANCISCO

Architectural Resources Group (1995) *Guidelines for Rehabilitating Buildings at the Presidio of San Francisco*, National Park Service

Historic American Building Survey Report, Presidio of San Francisco

National Park Service and US Department of Energy (1997) *Tenant Guidelines for the Energy Efficient Renovation of Buildings at the Presidio of San Francisco*

National Park Service, *Cultural Landscape Analysis, Presidio of San Francisco*

National Park Service, *Cultural Landscape Treatment Guidelines, Presidio of San Francisco*

National Park Service, *Final General Management Plan Amendment, Presidio of San Francisco*

National Park Service, *Presidio Signage Guidelines*

National Park Service, *Presidio Vegetation Management Plan*

Presidio National Register of Historic Places Registration Forms

ENVIRONMENTAL RATING SYSTEMS

US Green Building Council, *Leadership in Energy and Environmental Design*,
http://www.usgbc.org

DESIGN PROCESS INFORMATION

Center for Economic Conversion, *Design Services for Sustainable Buildings*,
http://www.conversion.org/grn_conv.html

Appendix A

Form for Contractor's Solid Waste Management Plan

Project Title: _____

Contractor's Name_____

Street Address: _____

City, State, Zip: _____

Phone: _____ Fax: _____

Date Submitted: _____

Below are procedures to be used for reusing, salvaging, and recycling materials. Using this procedures list, indicate the procedures (by number), types of materials and estimated quantities that will be recycled, reused or disposed of in the table below.

PROCEDURES:

1. Hand-dismantled to recover salvageable materials.
2. Source separation of materials and haulting separately to recyclers.
3. Hauling mixed debris to a recycling facility for sotring.
4. On-site composting of green debris.
5. On-site concrete and asphalt crushing for reuse on-site.
6. On-site concrete and asphalt crushing for use off-site.
7. Using as backfill or accepted as daily cover at landfill.
8. Burning for energy generation.
9. Landfilling.
10. Other (please describe): _____

Solid Waste Management Plan

Type of Material	Procedure # (Use list above)	Facility for Destination Location	Estimated Quantities		
			Tons	Cubic Yards	Units
Asphalt					
Concrete					
Metals					
Rock & dirt					
Paper/cardboard					
Green debris					
Wood					
Drywall					
Masonry					
Other					

Appendix B

Material VOC Limits

Material	VOC limit
Welding and Installation	
Non-vinyl backed indoor carpet installation	150
Carpet pad installation	150
Wood flooring installation	150
Ceramic tile installation	130
Dry wall and panel installation	200
Sub-floor installation	200
Rubber floor installation	150
VCT and asphalt tile installation	150
PVC welding	510
CPVC welding	490
ABS welding	400
Plastic cement welding	350
Cove base installation	150
Adhesive primer for plastic	650
All others	250
Substrates	
Metal to metal	30
Plastic foams	120
Porous material except wood	120
Wood	30
Fiberglass	200

Limits on VOCs in grams per liter for sealants and sealant primers are as follows:

Material	VOC limit
Sealants*	
Architectural	250
Roadways	250
Roofing material installation	450
PVC welding	480
Other	420
Sealant primers	
Architectural – non-porous	250
Architectural – porous	775
Other	750

*Regulation 8, rule 51 of the Bay Area Air Resources board (June 5, 1996) for sealants.

Green Seal standard is intended for paints and anti-corrosive paints. Both interior and exterior paints are addressed by the standard. Limits on VOCs in grams per liter for paints and anti-corrosive paints are as follows:

Material	VOC limit
Interior Coatings	
Non-flat	
Flat	
Exterior Coatings	
Non-flat	
Flat	

Carpet and Rug Institute Green Label Testing Program limits on VOCs for carpets, cushion, and adhesives are as follows:

Material	VOC limit
Carpets	
Total VOCs	0.5
4-Phenylcyclohexane	0.05
Formaldehyde	0.05
Styrene	0.4
Cushion	
Total VOCs	1.00
4-Phenylcyclohexane	0.30
Formaldehyde	0.05
Styrene	0.05

Material	VOC limit
Adhesives	
Total VOCs	10.0
Formaldehyde	0.05
2-Ethyl-1-Hexanol	3.0

Appendix C

Green Building Materials List

Material Category	Specification	Suppliers	Stocking	Line/Pricing	Contact Info
Adhesives	Low-VOC	Ceiling Systems Supply, San Francisco		Titebond Solvent Free Construction Adhesive: $3.75/cartridge	415-642-6750
		Home Depot		Titebond Solvent Free Construction Adhesive	650-757-9360
		Lowe's		Titebond Solvent Free Construction Adhesive	650-616-7800
Bathroom partitions, Plastic	20-100% recycled	Service Oriented Sales	1-3 weeks lead time depending on color.	Santana partitions: around $800-850 per stall; $1000 accessible	Patrick Comerford, Gary Wooller, or Karen Calvanico: 877-767-4636
		Yemm & Hart	6-8 weeks lead time for 50 color pattern options or for custom colors	Origins (100% recycled HDPE): Cost averages: $1200 per stall plus freight for floor mounted/overhead braced $1300 per stall plus freight for ceiling hung (Average includes urinal screens & accessible partitions)	Phone: 573-783-5434 Fax: 573-783-7544
Bathroom Partitions, Steel	16-67% recycled	Chaix Company	5-6 weeks	Hadrian partitions: Floor mounted, overhead braced around $1000 per stall	Dennis Chaix – 510-444-1300
Cabinets, Custom	FSC-certified particleboard & veneer cabinetry w/low-VOC finish	Golden Gate Kitchens	Special order (12-14 week lead time)	Neil Kelly custom cabinetry	Golden Gate Kitchens 408-370-2388
Carpets	Nylon 6,0 fiber & meets CRI GreenLabel IAQ standards	Mohawk Carpets*	2-4 weeks lead time.	$14-19/sf – see Presidio Trust Green Building Materials Library	Matt Kine: 415-990-4706
		Blueridge Carpets	96% of carpets ship in 2 wks or less; plus freight	$11-16 plus installation	Armin Maier or Jon Hart: 415-332-6467
		J&J Commercial	Various. See Presidio Trust Green Building Materials Library.	$16-28 installed	Todd Youngs: 415-720-9800
Carpet Cushion	Rebond cushion (100% recycled content)	*Purchase from carpet supplier*		*See carpet supplier*	*See carpet supplier*
Concrete	25-33% fly ash content	Boede Gravel	Yes	Available. Standard pricing.	Bill: 415-487-3260

MATERIAL CATEGORY	SPECIFICATION	SUPPLIERS	STOCKING	LINE/PRICING	CONTACT INFO
Countertops		Counter Production	Lead time depends on project	$95 per square foot, plus $45/person/hr installation	510-843-6916
Entryway Track-Off Systems		Milliken	First Appearances 3-part track-off system	2-4 weeks lead time depending on stock and order details $85-90/yard installed	Mike Valerio, Home Schurba & Assoc.: 650-871-5194 Milliken Contact: Jeff Palladini: 415-454-8575 cell:415-385-3292
Expansion Joint Filler	100% post-consumer recycled material	Ace Lumber	Special order	Homex 300 by Homasote	Jim Jones: 650-588-5711
Finish Material	FSC-certified	Earth Source Forest Supply, Berkeley	Yes	Trim, Hardwood Flooring, Hardwood Plywood, MDF	Larry Percivale: 415-648-2853 Fax: 510-644-9663
		Eco Timber	Yes	Flooring and Decking, MDF	Sales/Kael: 510-549-3000 Fax: 510-549-3001
		Vida	1-2 weeks	Hardwood veneer pressed on particle board casework	Sales: 415-467-4800
Form Release Agents	Zero-VOC	Stevens Distributing	8-10 day lead time	SoySolv form release agent, 55-gallon: $350 + approx. $100 s&h	Dave Stevens: 619-424-3220
Insulation, Fiberglass batt	Formaldehyde-free, 25% recycled content	Home Depot	Johns Manville products: *All Johns Manville products will be formaldehyde-free by July 1, 2002.*	*See Appendix D*	650-757-9360
Laminated Paperboard	100% recycled	Beronio Lumber, San Francisco	Yes	Homasote $23/sheet	Bill Fosset: 415-824-4300 Fax: 415-824-3706
Lighting: Ballasts	Electronic instant/rapid start ballasts for 4' lamps	Safeco, San Francisco			Lick Tong: 415-543-8288 Fax: 415-206-9193
		CME Lighting Supply, Concord	Yes	Case of 10: $114 - $136.90	Douglas McGrath: 925-685-9233 Fax: 925-676-5744

MATERIAL CATEGORY	SPECIFICATION	SUPPLIERS	STOCKING	LINE/PRICING	CONTACT INFO
Lighting: Lamps	Energy Star approved compact fluorescent screw-in lamps	Safeco, San Francisco			Lick Tong: 415-543-8288 Fax: 415-206-9193
		CME Lighting Supply, Concord	Yes	Case of 6: $49.50	Douglas McGrath: 925-685-9233 Fax: 925-676-5744
	TCLP-compliant linear fluorescent lamps	Safeco, San Francisco			Lick Tong: 415-543-8288 Fax: 415-206-9193
		CME Lighting Supply, Concord	Yes	Case of 25:$43.75	Douglas McGrath: 925-685-9233 Fax: 925-676-5744
Lumber, Framing	FSC-CERTIFIED	Hayward Lumber, Salinas	Yes, Free Delivery	2x, 4x, 6x, 12x DF #1, 2& BTR	Daryl Oliphant: 831-755-8800 Fax: 831-755-8821
		Golden State Lumber, Marin	Centrally Warehoused, 1-day turnaround	2x to 12" X 12", DF #1, 2& BTR	Chris Eddy: 415-454-2532 Fax: 415-454-6318
		Beronio Lumber, San Francisco	Special Order	2x, 4x, 6x DF #1, 2& BTR	Bill Fosset: 415-824-4300 Fax: 415-824-3706
Lumber, Treated	Arsenic-free: ACQ Treated	Hayward Builders Center	Yes	2x, 3x, 4x DF#2BTR, 6x DF#1	Daryl Oliphant: 831-755-8800
		Sierra Point Lumber, Brisbane	Yes	2x, 4x, DF #2BTR 4x8, 6x DF#1	Jeremy: 415-468-1000
	Arsenic-free: CBA Treated	Golden State Lumber	Yes, Free Delivery	2x, 4x, DF #2BTR 4x8, 6x DF#1	Chris Eddy: 415-454-2532
		Truit and White, Berkeley	Yes, $40 Delivery	2x, 4x, DF #2BTR 4x8, 6x DF#1	Roger: 510-841-0510
MDF	Formaldehyde-free	Hayward Lumber, Salinas	Yes (Medite II)	Medite II Thicknesses: 1/2", 5/8", 3/4"	Daryl Oliphant: 831-755-8800
Paint	Interior finish coats (VOC limit 50-150 g/L), custom pastel color	❖ Benjamin Moore ❖ ICI Dulux ❖ Kelly Moore	Yes.	❖ Benjamin Moore Pristine Eco-Spec Interior Latex 219-1B series 5-gal $116.46 ❖ Eggshell Enamel ICI Dulux Life Master 2000 5-gal $84.85 ❖ Kelly Moore Enviro-Cote Enamel 5-gal $133.00	❖ Benjamin Moore: Creative Paint & Wallpaper, Inc. 5435 Geary Blvd. San Francisco, CA 94121 415-666-3380 ❖ ICI Dulux 1580 Pacific Ave. San Francisco, CA 94109 415-673-6927 ❖ Kelly Moore 3414 Cesar Chavez San Francisco, CA 94110 415-826-3440

MATERIAL CATEGORY	SPECIFICATION	SUPPLIERS	STOCKING	LINE/PRICING	CONTACT INFO
	Exterior finish coats (VOC limit 100-200 g/L), custom pastel color	❖ Benjamin Moore ❖ ICI Dulux ❖ Kelly Moore	Yes.	❖ Benjamin Moore Moorcraft Super Spec Flat Latex House Paint 171-1B series 5-gal $102.42 ❖ ICI Dulux Professional Exterior 100 Percent Acrylic Flat Paint 5-gal $82.50 ❖ Kelly Moore Acry-Shield Acrylic Flat Paint 5-gal $79.50	*See above.*
Paint, Reprocessed Consolidated Latex	20-80% recycled – custom pastel color, semi-gloss	❖ E-Coat	Yes.	❖ E Coat (division of Kelly Moore) – 1 gal $8.99 retail	Ray Julian: 800-874-4436, x198 916-921-0165 – Evans Bradshaw
Plywood	FSC-certified	EarthSource, Berkeley	Yes (Medite II)	¼", ½", ¾" 4'x8', typically available in maple, cherry, mahogany, birch. Others available as special order. Call for pricing – varies, but typically no price premium.	Larry: 866-549-9663
Primer	Interior Primer (zero VOC limit)	❖ Benjamin Moore ❖ ICI Dulux ❖ Kelly Moore		❖ Benjamin Moore Pristine Eco-Spec Interior Latex Primer Sealer (only in 1 gal container) $22.15 ❖ ICI Dulux Life Master 2000 5-gal $83.60 ❖ Kelly Moore Enviro-Cote Acrylic Primer 5-gal $97.90	*See above.*
Rubber Floor Tiles	90-100% recycled	Bruce Adams & Associates	10 days to 2-weeks	Dodge Regupol, ECOnights rolls - 4' wide x 4 mm - $2.50/sf	Bruce Adams: 707-938-8431
Skylights, unit		Solalight, Pleasanton	1-1.5 weeks	Solatube Brighten Up skylight series, 10" & 14"	800-655-4354
		Regal Road Skylights, Richmond		Sun Tunnel 14" & 22" skylights	510-237-5159

MATERIAL CATEGORY	SPECIFICATION	SUPPLIERS	STOCKING	LINE/PRICING	CONTACT INFO
Structural Fiberboard	80-100% recycled	USG	Yes	Fiberock sheathing $0.36/sf for small project	Joe Joslin: 925-256-7638
Wheel Stops	98% post-consumer content, solid throughout	The Parking Block Store PO Box 6 Sherwood, MD 21665	Yes	Blue, White Less than 25: $16 More than 25: $14 Quantity: $13.25	Bill Snook: 800-683-9963

Appendix D

Formaldehyde-Free Insulation

Johns Manville Insulation R-Value	Item Order Number	Width x Length	Thick inches	Pcs. Per Bag	Sq. Ft. Per Bag	Bags Per Unit	Price
ComfortTherm Poly-wrapped							
R-19	E004	15” x 93”	6.5	9	87.18	4	$29.05
R-19	E008	23” x 93”	6.5	9	133.68	4	$44.55
Kraft-faced							
R-11	K1254	15” x 93”	3.5	16	155.00	5	$34.33
R-11	K1255	23” x 93”	3.5	16	237.66	4	$52.64
Unfaced							
R-11	U1339	15” x 93”	3.5	16	155.00	5	$31.31
R-11	U1362	15” x 105”	3.5	20	218.75	3	$44.18
R-11	U1340	23” x 93”	3.5	16	237.66	4	$48.00
Unfaced (formaldehyde free) – Thermal-SHIELD Free and Sound-SHIELD							
R-11	AFF002	16” x 96”	3.625	16	170.70	5	$34.95
Unfaced Thermal-SHIELD and Sound-SHIELD							
R-11	AU397	16” x 96”	3.625	16	170.66	4	$34.76
R-11	AU398	24” x 96”	3.625	16	256.00	4	$51.71
Unfaced Sound-SHIELD Sound Attenuation Blanket							
	AU1622	16” x 96”	2.75	24	256.00	4	$40.38