

**SUSTAINABLE BUILDING  
GUIDE  
(SBG)  
May 2003**

"They only are loyal to this college who,  
departing, bear their added riches in trust for mankind."  
James A. Blaisdell.

**This Sustainable Building Guide is intended as a working outline for designers and contractors that work at Pomona College. Accordingly, as a working document, various components may be periodically updated. It is the responsibility of the designers to verify and confirm any questions regarding this manual with the Office of Campus Planning and Maintenance (CPM). Please contact CPM for permission to utilize this document outside of the intended use for Pomona College.**

**Contributing Authors:**

**Alan Bush -- Pomona '03  
Emily Curran -- Pomona '03  
Tony Ichsan -- *LEED Accredited Professional***

**Edited by:**

**Office of Campus Planning and Maintenance  
Jim Hansen – Director  
Tony Ichsan – Assistant Director, Project Coordinator**

**Office of the Dean of the College  
Patricia Smiley – Associate Dean**

***The authors and editors would like to thank all who participated in providing comments and input on this first attempt at communicating Pomona College's commitment to sustainability. We would also like to express our appreciation to sources that we utilized to compile the information in the guide.***

## TABLE OF CONTENTS

### **I. Introduction**

1. Background
2. Purpose
3. Guide Users
4. Building Types and Usage
  - Administrative and Offices
  - Academic
  - Athletic
  - Information and Technology
  - Residential

### **II. Process**

1. Approval Process Requirements
2. Office of Campus Planning and Maintenance
3. Funding and Budget
4. City of Claremont Interaction
5. Programming
6. Schematic Design
7. Design Development
8. Construction Documents
9. Notice to Proceed
10. Construction
11. Commissioning
12. College Acceptance
13. Post-Occupancy Analysis and Ten-Month Review

### **III. Guidelines**

1. Site Management
2. Water Management
3. Energy Management
4. Materials, Resources, and Waste Management
5. Indoor Environmental Management

### **IV. Appendix**

- A. Environmental Policy

## **SUSTAINABLE BUILDING GUIDE**

### **I. Introduction**

#### 1. Background

Pomona College is an independent coeducational liberal arts college founded in 1887. The Pomona College founders created a model that emulated East Coast institutions of higher education. By design, the College is a small residential institution with approximately 1,500 students currently enrolled. Located in Claremont, California, 35 miles east of Los Angeles, Pomona College is the founding member of the Claremont Colleges, a consortium of seven independent institutions that comprise an academic community of 5,500 students. The consortium consists of five undergraduate and two graduate institutions, and although they are academically independent, all but one is located on adjacent campuses. Pomona's 140-acre campus consists of 40 buildings, including 12 dormitories throughout the campus housing nearly all students in attendance. Pomona College's curriculum offers 44 majors in the natural sciences, social sciences, humanities and fine arts. It is recognized as one of the nation's preeminent liberal arts colleges as ranked by various surveys of the top institutions in the country.

#### 2. Purpose

The Sustainable Building Guide (SBG) was created to provide guidance for future construction and renovation projects. With the world's limited resources, structuring an intelligent relationship with the environment is of great importance. Southern California, like much of the West, has a tenuous relationship with both its water and power resources. Building with mindfulness to these concerns is central to Pomona's values and essential to insure the longevity of Pomona's traditions. One of the important ways in which Pomona's community will bear its riches in trust for mankind will be to not misuse our wealth, but to employ it prudently, effectively, and efficiently. This philosophy has resonance for us, not just after departing Pomona but for our community within Pomona as well. In many respects, this philosophy begins with our campus, its buildings and grounds and the form that they give to our everyday life. Pomona College, as a premier institution, carries both the privilege and responsibility to forge and define a new relationship with the environment (*Appendix A*).

The SBG is a template for architects, engineers, designers and contractors, as well as Pomona College end-users and administrators, that provides a guide to Pomona's philosophy for its built environment, as well as supporting its historical heritage requirements. Drawing from the U.S. Green Building Council Leadership in Energy and Environmental Design (LEED) standards, the SBG provides basic goals for the renovation, design, and construction

phases of a building's lifecycle. For each of these phases, the SBG offers a road map for the creation and maintenance of the built environment that embodies Pomona's philosophy of a healthy and productive learning atmosphere and our desire for a sustainable future. The SBG includes guidelines for site management, water and power usage, indoor environmental quality, materials choice and usage, and waste management, and affords flexibility to adapt these goals to the needs of any building project.

### 3. Guide Users

- 3.1 Designers – This guide sets forth in the broadest terms the sustainable goals that are expected to be achieved by the designer in the fulfillment of a design contract. It is a working tool that is based on Pomona's philosophy and proved procedures/best practices in the spirit of achieving sustainable designs. This tool is a reference to the designers and is not intended to conflict with the owner/architect agreement.
- 3.2 Contractor – The contractor should use this manual as a reference to understand the expectations of the College in the administration of the project. The SBG provides a reference to the contractor and is not intended to conflict with the owner/contractor agreement.
- 3.3 Campus Community – This guide is intended as a reference tool identifying to the campus community Pomona's philosophy and commitment to sustainable building designs and practices.

### 4. Building Type and Usage

*“Pomona College is dedicated to preserving the architectural integrity and heritage of its buildings and landscaping. The College respects and has largely followed Myron Hunt's 1908 master plan for the campus, Ralph Cornell's subsequent landscape master plan leading to the creation of a “campus in a garden,” and Richard Dober's more recent land use plan, which reflects and builds on the work of Hunt and Cornell. To the extent that it is practicable, recognizing that new needs arise over time, the College will honor the concepts of this early work and will, in addition, strive to create a sense of architectural harmony and cohesion as new buildings are constructed and existing buildings are renovated. Implementation of this policy is the responsibility of the Buildings and Grounds Committee.”* (Architectural Heritage Policy, March 2000)

Within this framework, this SBG can be applied to the following general categories of buildings at Pomona College.

- 4.1 Administrative and Offices (e.g., Alexander Hall, Sumner Hall, Renwick House). The architecture of these facilities represents a wide range of

styles and periods. Typically these buildings are used mostly during business hours, 8 a.m. to 5 p.m. weekdays. These facilities are used year-round, hence utilities and HVAC can only selectively be interrupted.

- 4.2 Academic (e.g., Carnegie, Seaver Sciences, Pearsons, Mason). Since Pomona College's founding in 1887, the academic facilities range in purpose and architecture. There are three disciplinary divisions at the College: Natural Sciences, Social Sciences, Humanities and Fine Arts. The academic facilities house classrooms, department offices and support space, wet laboratories, dry laboratories, and libraries. Although most of these facilities are used from September through May, there is active research during the summer, especially in the Natural Sciences buildings. Classes typically run from 8 a.m. to 4 p.m. weekdays, with some evening classes. Throughout the academic departments there are department libraries, study areas, and lounges where students can gather, interact, read, and meet with faculty.
- 4.3 Athletic (e.g., Rains Center, Pendleton, Merritt, Haldeman). In addition to various NCAA Division III teams, there is also intramural and recreational usage of the athletic facilities. Use is typically periodic, but year-round. The use also varies with the particular season.
- 4.4 Information and Technology (e.g., Seeley Mudd, Gibson, Andrew). Pomona's computer facilities are interspersed throughout the campus, including a facility in the south dorm area. There are student computer areas that have 24-hour access and there are data ports in dorm rooms. Hence, audio-visual and voice/data must be incorporated in all types of projects. There are specific IT requirements and standards that are constantly updated. It is the designer's and contractor's responsibility to confirm through CPM that the most current standards are utilized.
- 4.5 Residential (e.g., Smiley Hall, the Clarks, Oldenborg, Lyon). As a residential college, Pomona's dorms are fully utilized from late August through late May. In addition to students, there are a few faculty residences dispersed throughout the dorms. During the summer, certain dorms are used to house student assistants, research assistants, and summer conference attendees. Work cannot begin prior to 10 a.m. in the dorms, and no work can occur during "reading days".

## **II. Process**

1. Approval Process Requirements – Pomona College trustees, administration, user groups, and the Office of Campus Planning and Maintenance all have specific roles in the approval process and therefore require specific materials in order to facilitate their roles. This section of the guide seeks to highlight these

requirements, as well as the general instruments of services such as drawings, models, and written material typically provided during design and construction.

2. The Office of Campus Planning and Maintenance – CPM is the primary client contact for the design team and contractors. A member of the staff and/or project manager will be assigned to the project, and all communication and direction should be through this office. The College will not accept any authorization to proceed without written approval and direction from CPM for the project.
3. Funding and Budget – Once a total project budget (which includes all “hard and soft” construction costs) is established, CPM forwards it to the Treasurer for review and approval. Once approval has been received, a presentation is made to Pomona College’s Board of Trustees Buildings and Grounds Committee for final approval of budget and schedule. CPM will outline the budget process at the beginning of the process.
4. City of Claremont Interaction – Any interaction with the City with regard to a Pomona College project occurs only with CPM approval and/or participation. Construction work hours are between 8:00 am and 8:00 pm, Monday through Friday. All codes must be followed. This is dependant on Campus approval.
5. Programming – CPM coordinates with the office of the Dean of the College to establish a steering committee representing the various end users on academic projects and the Dean of Student Life for student residence projects. Initially, the steering committee is tasked with assisting the design team to establish users’ operational needs. Throughout the programming and the schematic design phases of the project, the steering committee will have an opportunity to provide input into the project. Approval of each phase of the design is the responsibility of the administration acting through CPM, which weighs steering committee requests and budget and schedule requirements as approved. Programming and design also include an investigation of ways to integrate sustainability into all aspects of the project. Sustainability is a primary goal of all projects. This approach is the most cost-effective way to achieve integrated sustainable design.
6. Schematic Design – Throughout the schematic design phase, sustainable issues will be discussed and various options presented by the design team for consideration by the campus. Sustainable options will be weighed with budget and schedule constraints during this phase.
7. Design Development Phase – At this phase of the project the campus administration, through CPM, will agree to sustainable design features. Features approved by the Board of Trustees will be incorporated into the construction documents.

8. Construction Documents – In this phase, implementation of sustainable design features are set forth in detail. The design team will work to make sure that sustainable building features are clearly communicated in the project documents so that contractors' bids reflect true costs of implementation.
9. Notice to Proceed – This document is issued by CPM and is required for every phase of the project. This notice shall provide budget and schedule milestones. At any point, CPM may schedule value engineering or an interdisciplinary peer review. After weighing all input, CPM will make the final V. E. determination. The architect is responsible to meet budget and schedule milestones; if at any phase the College's estimation of the budget is not met, the services of the architect can be terminated.
10. Construction – During construction, the architect and design team will continue to assist CPM with review, advice, and documentation of decisions necessary to administer the timely construction process and procedures. The contractor(s) will be expected to follow procedures to decrease the environmental impact of construction (e.g., through materials selection, waste recycling, erosion prevention, etc.), as well as to implement sustainable features called for in the construction documents.
11. Commissioning – All projects will have a “commissioning” period. Additionally, for significant projects, a “commissioning agent” may be hired by the owner to provide specific services in order to verify that the building systems meet the original intent of the building owner and designers.
12. College Acceptance – On behalf of the College, CPM or its designated representative will issue an acceptance of work completed.
13. Post-Occupancy Analysis and Ten-Month Review – Prior to the expiration of the 10-month warranty period, a review to ascertain the adequacy of performance of materials, systems, and equipment will be conducted. Any corrections will be implemented in a timely manner by action of the designers and contractors.

*For designers, consultants and contractors working at Pomona College, please be aware that we have asbestos-containing materials, lead-based paint, and other hazardous materials associated with a campus of our age and size.*

### **III. Guidelines**

The following guidelines apply to various types of projects such as, but not limited to: new construction and major renovation of buildings and landscape, sustainable operation of existing buildings including system upgrades, and interior maintenance projects. These guidelines shall be adhered to when feasible and meets the

required schedule. Responsibility for adherence lies with architects, contractors, and/or CPM

## 1. Site Management

- 1.1 Erosion and Sedimentation Control: Adopt a plan for the project site during construction; use EPA approved Best Management Practices to prevent erosion, sedimentation and pollution of stormwater runoff.
- 1.2 Site Selection: Avoid prime wetland, parkland, or land identified as habitat for any threatened or endangered species, and select instead sites that provide urban infill and redevelopment. Work to reduce the development footprint and prevent sprawl by stacking the building, using tuck-under parking, and sharing facilities with neighbors. Continue to occupy existing buildings.
- 1.3 Alternative Transportation: Provide secure bicycle storage, preferred parking for carpools or vanpools, and consider sharing parking facilities with adjacent buildings.
- 1.4 Reduce Site Disturbance: Limit site disturbance to 40 feet beyond the building perimeter or on previously developed sites, and restore a minimum of 50% of the site area with native vegetation. Restore vegetated ground cover and remove excessive paved areas, replacing them with indigenous plant species.
- 1.5 Stormwater Management: Promote infiltration and prevent pollution of stormwater runoff by including measures such as garden roofs, pervious paving, infiltration trenches, bioswales, or stormwater capture systems. Reuse storm water for landscape irrigation, toilet flushing, and custodial uses. Design a constructed wetland to treat a site's stormwater where appropriate.
- 1.6 Reduce Heat Island Effect: Use more shade and vegetation and less pavement. Select light colored paving materials and use EPA Star Cool Roof products where feasible.
- 1.7 Green Site and Building Exterior Management (for existing buildings): Encourage ground and building management practices that have the lowest environmental impact. Lower the use of chemicals and fertilizers. Select landscaping that requires little maintenance, water and chemical inputs.

## 2. Water Management

- 2.1 Water Efficiency: Maximize water efficiency within buildings to reduce the burden on municipal water supply and wastewater treatment. Install water-conserving plumbing fixtures and high efficiency water usage equipment.

- 2.2 Minimize Use of Potable Water: Use alternatives to potable water for sewage transport such as recycled stormwater. Reduce the use of municipally provided potable water for sewage conveyance by 50% or more over existing conditions by capturing gray water (from sinks, laundry machines, dishwashers).
- 2.3 Water Efficient Landscaping: Install, use, and maintain high efficiency irrigation technology that reduces potable water consumption for irrigation by 50%.
- Discharge Water Compliance: Protect waterways, water supply, and natural habitat from pollutants carried by building discharge water. Install a filtration system for in-building generated discharges and dispose of properly.

### 3. Energy Management

- 3.1 Fundamental Building Systems Commissioning: Verify and ensure that fundamental building elements and systems (heating system, cooling system, humidity control system, lighting system, safety systems, and building automation controls) are designed, installed, and calibrated to operate as intended. Re-test and repair or upgrade all systems components that are found to not be working according to the specifications of the building operation plan.
- 3.2 Optimize Energy Performance: Establish the minimum level of energy efficiency for the base building and systems as required by the EPA ENERGY STAR label benchmarking score of 60 for buildings, or the local energy code. Provide calculations showing the building energy efficiency and provide a summary of the annual bills for each type of energy used by the building. Over time, achieve increasing levels of energy performance above the prerequisite standard to reduce use of non-renewable fuels and environmental impacts.
- 3.3 Ozone Protection: Reduce ozone depletion with zero use of CFC-based refrigerants. Reduce the amount of HCFCs and Halons in mechanical equipment and fire extinguishers.
- 3.4 Renewable Energy: Supply and maintain a net fraction of a building's total energy use with on-site renewable energy systems to reduce the environmental impact associated with fossil fuel energy use.
- 3.5 Continuous Building Commissioning and Maintenance: Ensure that the building systems are continuously commissioned and maintained appropriately so that they go on delivering target building performance goals over the long term.

- 3.6 Measurement and Verification: Demonstrate ongoing optimization of building energy and water consumption over time through appropriate data collection and analysis.
  
- 4. Materials, Resources, and Waste Management
  - 4.1 Waste Management: Reduce the amount of waste generated by building occupants that is hauled to and disposed of in landfills. Provide recycling bins in and outside the building for occupant recycling.
  - 4.2 Building Reuse: Extend the life cycle of existing building stock in order to conserve resources, reduce waste, and reduce environmental impact of building materials manufacturing and transport. Try to reuse an old building before constructing a new one.
  - 4.3 Construction Waste Management: Divert construction materials from entering landfills. Direct recyclable materials, including cardboard, metals, concrete, brick, asphalt, wood, plastic, glass, and carpet, to the appropriate handler for re-use.
  - 4.4 Resource Re-use: Re-use existing building materials in future construction to reduce the need for raw materials as well as the amount of waste sent to landfills.
  - 4.5 Recycled Content: Increase the recycled content of building products. Specify that 50% of the building materials contain 20%+ post-consumer recycled materials, or 40%+ post-industrial recycled materials.
  - 4.6 Local/Regional Materials: Reduce the impact of transportation and support the local economy by increasing demand for locally manufactured building products.
  - 4.7 Rapidly Renewable Materials: Use materials such as cotton, bamboo, linoleum, cork, rubber and wool to replace finite raw and long-cycle renewable materials.
  - 4.8 Certified Wood: Encourage sustainable forestry by implementing a certified wood (e.g., Forest Stewardship Council (FSC)) purchasing requirement when feasible for any construction or renovation project.
  
- 5. Indoor Environmental Management
  - 5.1 Construction Indoor Air Quality (IAQ) Management: Prevent indoor air quality problems resulting from the construction/renovation process.

- 5.2 Minimum IAQ Performance: Establish minimum IAQ performance standards to prevent the development of indoor air quality problems and maintain the comfort and well being of the occupants. Ensure and maintain outside air introduction and distribution.
- 5.3 Environmental Tobacco Smoke (ETS) Control: Prevent exposure of nonsmokers and building systems to ETS by prohibiting smoking in the building. Prevent smoking within enclosed areas during the construction process.
- 5.4 Carbon Dioxide (CO<sub>2</sub>) Monitoring: Provide IAQ monitoring by installing and maintaining CO<sub>2</sub> sensors.
- 5.5 Low-Emitting Materials: Reduce the quantity of potentially irritating indoor air contaminants. Use paints, finishes, carpets etc., with low volatile organic compounds. Avoid occupant exposure to potential hazardous material by employing, for example, grills before the entryway and proper drains.
- 5.6 Thermal Comfort and Control: Provide for a thermally comfortable environment that supports productive and healthy performance as well as individual control. Follow the requirements of ASHRAE 55-1992 Addenda 1995.
- 5.7 Daylight and Views: Help to increase occupant well-being and productivity by inclusion of sunlight and outdoor views into a building's occupied areas, as well as natural lighting when feasible.

## **V Appendix**

### **A. Pomona College Environmental Policy**

*Pomona College recognizes that the local and global environment in which it operates must be protected for future generations. It is therefore committed to the further development of an ethos of resource sustainability among faculty, staff and students and to the incorporation of environmentally sound practices in its operations. Such commitments are essential if future generations are to have a healthy and productive environment.*

*These goals are achieved through*

- *educational programs designed to increase awareness of the need for the responsible use of resources – particularly significant in light of the residential nature of the campus, wherein students have the opportunity to learn and apply environmentally responsible practices in their everyday lives;*
- *operational programs designed to reduce the amount of resources consumed and to reuse and recycle resources wherever possible;*
- *a construction and renovation program that assures to the maximum extent physically and financially feasible environmentally sustainable design, using the U.S. Green Building Council LEED Rating System as one standard of reference.*

*The following list illustrates the types of operational efforts implemented by the College:*

- **energy:** *reducing the consumption of energy, installing energy-efficient equipment as part of all renovation and new construction projects, and using renewable sources such as solar panels and ground source heat pumps, to the extent physically and financially feasible;*
- **water:** *reducing the consumption of water, through the installation of water-saving equipment in facilities, careful management of irrigation, and special consideration and encouragement of the use of native plant species, due to their drought-tolerance and ecological advantages;*
- **air quality:** *sponsoring a faculty home loan program that encourages faculty to live near campus, offering incentives for carpooling and the use of alternative modes of transportation, and increasing the proportion of low emission vehicles in the College's fleet;*
- **recycling:** *expanding the recycling program for paper, aluminum, glass, food waste, and plastic products to include construction materials and organic landscape trimmings;*
- **procurement:** *purchasing products made of recycled materials, buying from environmentally responsible vendors whenever feasible;*

- **hazardous materials:** *handling and disposing of hazardous materials safely and responsibly, and using environmentally sound pest and weed control methods.*

*The College's Office of Campus Planning and Maintenance, with the advice of a campus-based committee of faculty, staff, and students, has primary responsibility for the development of specific procedures to which the campus will adhere in achieving the objectives outlined above.*

*The Board of Trustees monitors this policy through the review of annual reports documenting the College's progress. Policy and practice are subject to change as the relevant technology evolves.*