Mount Holyoke College
Environmentally Responsible Green Building Design and Construction Guidelines
July 15, 2005

Table of Contents

3.0 Materials Storage, Work Areas and Parking
4.0 Top Soil Preservation
5.0 Storm Water Management

B. Environmental Quality
1.0 Site Protection and Health and Safety

C. Materials and Resources
1.0 Recycling and Disposal of Demolition and Construction Debris
2.0 Housekeeping

IV. Deliverables

A. Pre-Design
1.0 Green Strategies Workshop
2.0 Performance Plan

B. Design
1.0 Performance Plan Updates
2.0 Submittals

C. Construction

D. Systems Review/Commissioning

Sources and Acknowledgements

U.S. Green Buildings Council, November 2002. Green Building Rating System for New Construction and Major Renovations, LEED-NC, Version 2.1.

University of Buffalo, 2004. UB High Performance Building Guidelines.

City of San Juan Capistrano, 2002. Construction Housekeeping.
Thompson, J. William and Kim Sorvig, 2000. Sustainable Landscape Construction: a Guide to Green Building Outdoors. Island Press.

Alexander, Christopher, Sara Ishikawa, Murray Silverstein, Max Jacobson, Ingrid Fiksdahl, and Shlomo Angel, 1977. A Pattern Language: Towns, Buildings, Construction. Oxford University Press.

Mount Holyoke College
Environmentally Responsible Green Building Design and Construction Guidelines
July 15, 2005

I. Introduction and Principles

A. Commitment to Environmental Stewardship

The Mount Holyoke College Plan for 2003 called upon the College community to "improve environmental literacy and awareness, generate scientific knowledge, guide public policy, and encourage students, faculty and staff to advocate and effect social change to improve the environmental health of our community and our world." While making continual progress toward that goal, the Mount Holyoke College Plan for 2010 calls upon us to "accelerate our progress toward systematic practice of environmental stewardship, providing an excellent example of synergy between curricular and administrative efforts and a clear focus on cost-effective applications of environmentally responsible principles."

As evidence of that commitment, MHC received certification under the USGBC's Leadership in Energy and Environmental Design (LEED™) Green Building Rating System, for the Science Center and Blanchard Campus Center. The Science Center, completed in the fall of 2003, is one of the nation's first LEED-certified science centers. In fact, the Science Center and Blanchard, a turn-of-the-century building that reopened in September 2003 after reconstruction and renovation, were among the first nine projects registered for LEED certification.

Subsequent to the completion of those two LEED certified buildings, the College established a Green Building Design and Construction Working Group tasked with making recommendations on the future implementation of green building design and construction principles on campus. The Group has recommended that Mount Holyoke define campus Environmentally Responsible Building Principles and Guidelines.

While achieving LEED certification is not precluded for major projects, it is generally not achievable for smaller renovation projects. Campus standards will allow for application of the Principles and Guidelines to all construction and renovation projects on campus. For those instances when a decision to achieve LEED certification is made, the LEED section appropriate to the guideline is listed parenthetically.

B. Environmentally Responsible Building Principles

Green building design has both an environmental and economic sustainability component. The College is committed to environmental stewardship including construction of green buildings, however, design choices must be made in light of the ability of the College to finance the project. The following Environmentally Responsible Building Principles serve as a guide in decision making during building siting, design, construction, and operation. MHC Environmentally Responsible Performance Guidelines detail siting, design and construction requirements to meet these Principles.

1. Site and design the building to minimize long-term environmental impact and operate the building to maximize the benefit of the environmental design elements.

2. Design and construct the building to minimize the impact on the natural environment of the site and the campus.
3. Optimize use of passive energy strategies to make the most of natural lighting, heating, cooling and shading to complement mechanical systems.
4. Design mechanical lighting, heating and cooling systems to minimize energy use and emission of greenhouse gases.
5. Create a comfortable and healthy indoor environment.
6. Minimize potable water use by mechanical systems, building occupants, and for exterior landscaping.
7. Minimize and control water runoff from the site to prevent degradation of Stony Brook and Upper and Lower Lakes.
8. Use building materials that minimize the life cycle environmental impact of those materials.
9. Minimize waste generation during the construction process and maximize reuse and recycling.

The following principles apply to the design process.

1. Introduce environmental responsibility early in the planning process.
2. Hire architects, engineers, and construction managers with experience in environmental design and construction and work collaboratively to achieve project goals.
3. Use life cycle costing to evaluate building cost.
4. Use building commissioning to evaluate systems and ensure performance standards are met.

C. Setting Goals

This document serves as a set of Guidelines to be used in the design and construction phase of construction and renovation projects on campus. While it may not be feasible to achieve all of the aspirations included in the Guidelines, the project review process established will establish goals for each project and measure performance against the Guidelines and individual project goals. These Guidelines are in addition to all legal obligations under local, state and federal codes and regulations. The Guidelines will be reviewed at least annually to determine if it is an effective tool in support of Mount Holyoke's Environmentally Responsible Building Principles.

II. Environmentally Responsible Green Building Design Guidelines

A. Site Selection and Stewardship

Principle: Site and design the building to minimize long-term environmental impact and operate the building to maximize the benefit of the environmental design elements.

Principle: Construct the building to minimize the impact on the natural environment of the site and the campus.

Principle: Minimize and control water runoff from the site to prevent degradation of Stony Brook and Upper and Lower Lakes.

A.1.0 Site Selection

1.1 Development Area

a. Select sites without sensitive natural features and restricted land uses.
b. Give preference to sites with existing building space or in developed areas of campus.
c. Restrict development to areas with existing infrastructure to protect undeveloped areas, and preserve habitat and natural resources.
d. Locate buildings and plantings so that deciduous trees block summer sun to the south and west, and evergreens block winter wind.

A.2.0 Site Analysis and Development

2.1 Resource Conservation

a. Determine whether or not inventories or analyses of natural (e.g., microclimate characteristics, habitats) or cultural (e.g., archeological) site features are needed to ensure that the project will achieve environmental goals and not have unanticipated impacts.
b. Map sun and shade patterns, and ground level wind patterns associated with new construction.
c. Conserve existing natural areas and restore degraded areas to provide habitat and maintain diversity.
d. Minimize impact on existing hydrological features (e.g., streams, lakes, wetlands, groundwater).

2.2 Site Access and Transportation and Parking

a. Promote walking and bicycling and provide safe routes, including extending sidewalks to the end of campus, and supporting landscape features (e.g., paths, seating).
b. Provide bicycle racks and evaluate need for changing rooms.
c. Encourage use of public transportation by locating buildings a convenient distance from bus stops or evaluating the need for bus route changes.

d. Avoid creation of additional parking spaces on campus and minimize parking lot size.

2.3 Building Footprint and Utility Placement

a. Minimize the building footprint and other impervious surfaces to minimize site disruption and stormwater runoff.
b. Cluster underground utilities running in conduits using shared-trench technology where feasible.
c. Locate underground utilities in roadways or fire lanes, to minimize site disturbance.

2.4 Stormwater Runoff Generation and Management

a. Maintain natural stormwater flows by designing the project site to promote infiltration and respect natural drainage patterns.
b. Minimize program needs for paved surfaces such as sidewalks and roadways.
c. Minimize stormwater runoff from impervious surfaces through use of groundwater recharge, porous paving materials, garden roofs or other techniques; consider overflow areas that use turf or other low impact material.
d. Use natural runoff control and treatment systems such as bioswales. If natural methods are not feasible capture all runoff from impervious surfaces and treat prior to discharge.
e. Reuse stormwater for non-potable uses such as landscape irrigation.
f. Hold slopes in place with biotechnical erosion controls (e.g., organic mulch/tackifier combinations).
g. Use greenwall technology (incorporating plantings) instead of hardscape for retaining walls.
h. Use planted buffers to direct grading and drainage.

2.5 Reducing Heat-Island Effect

a. Design planting to maximize shade on the site’s non-roof impervious surfaces.
b. Utilize technologies that reduce heat absorption (such as high albedo paving).

2.6 Utilize Sustainable Landscape Practices

a. Select plants that are native or adapted to the site’s microclimate. Stress plant diversity and avoid monoculture planting. Do not use invasive or potentially invasive plants.
b. Avoid the use of plant species that are high maintenance and have significant pest problems.
c. If possible, orient plants in the same direction they grew in the nursery.
d. Choose plants with water requirements that can be met by natural precipitation patterns. When irrigating is unavoidable, use soaker hoses, or other methods that minimize water loss.

2.7 Improve Soil Quality

a. Analyze planting soil and improve as needed.
b. Implement soil remediation measures as needed for the site such as introducing earthworms if they are sparse, adding organic matter and microorganisms to break down pollutants, and removing toxic materials.
c. Mulch plant beds to conserve soil moisture, and improve soil fertility and structure.
d. Use compost from on-campus sources when possible; do not use peat moss to amend soil since it is a non-renewable resource.
e. Compost any green waste from the site for use on campus.

2.8 Select Appropriate Materials For Landscaping Features

a. Use recycled, renewable, salvaged, and/or locally sourced materials when constructing landscaping features.
b. Consider using rapidly renewable materials, such as bamboo, which has been harvested using sustainable practices.
c. Use woods that have natural rot-resistance, such Ipe (“Ironwood”) from a sustainably harvested forest.
d. If pressure treated wood is necessary, use wood free from chromated copper arsenate.

B. Building Orientation and Design Characteristics

Principle: Site and design the building to minimize long-term environmental impact and operate the building to maximize the benefit of the environmental design elements.

Principle: Optimize use of passive energy strategies to make most of natural lighting, heating, cooling and shading to complement mechanical systems.

Principle: Use building materials that minimize the life cycle environmental impact of those materials.

B.1.0 Topography

a. Limit cut and infill by utilizing existing site contours.
b. Utilize/modify existing topography to obtain the insulating effect of earth (berming and other manipulations of the section).

B.2.0 Building Orientation

a. Optimize site placement and building form to reduce energy loads.
b. Orient buildings to protect entrances and minimize infiltration from prevailing winter winds. Take advantage of non-winter air movement by utilizing prevailing winds for natural ventilation.
c. Maximize passive solar opportunities by elongating the building structure on its east-west axis. Allow use of natural daylight and winter solar gain, while minimizing summer heat gains/cooling loads on the east and west building facades (eastern exposures are less problematic than western in terms of heating/cooling costs).

Consider north facing glazing for occupants requiring more uniform levels of diffuse daylight. Direct solar gain should be considered for all south-facing spaces where critical visual activities are not typically conducted.

B.3.0 Use of Natural Light

a. Optimize use of daylight in new and renovated campus facilities.
b. Review alternatives for reducing electric lighting use through daylight harvesting.
c. Strive for line of sight to vision glazing for regularly occupied spaces, creating views and connecting indoors and outdoors.
d. Avoid use of large glass atria or large glazed surfaces that cannot be justified from a programmatic perspective or by passive solar operating savings returns.
e. Maximize daylight through location and size of windows, skylights, and through use of glazing systems and shading devices.
f. Consider high clerestory windows to provide deep daylight penetration especially for space types needing useable wall space (e.g. libraries).

B.4.0 Building Envelope

4.1 Window Frame and Glazing Performance

a. When specifying metal window frames, provide thermal break for best thermal performance and to minimize condensation.
b. Control solar heat gain by selecting high performance glass considering different types (e.g., coefficients and visible transmittances) according to orientation. Consider U-value, solar heat gain coefficient, and visible light transmittance.
c. Consider fritted, and spectrally selective glazing tuned to use and orientation on south, east or west elevations.
d. Provide high performance, durable weather stripping to minimize infiltration.
e. Consider shading to let in natural light but exclude heat and glare and control contrast ratios. Shading strategies include vertical fins on east and west fenestration, overhangs or lightshelves on south fenestration, as well as arcades, trees, "brise-soleils," and deep window insets.

4.2 Effective Insulation

a. Optimally insulate the building shell (walls, roof, basements/foundation). When possible, utilize computer modeling to determine cost-effectiveness of adding insulation beyond code requirements.
b. Avoid thermal bridging in metal-framed assemblies through exterior wall, roof, and floor details and components.
c. Consider different design solutions for storing heat in the building structure or materials (e.g., south-facing opaque mass walls) and moderate interior temperatures where appropriate through the use of sufficient thermal mass.

4.3 Air and Moisture Control in the Building Envelope

a. Detail the building envelope to minimize infiltration and to prevent moisture build-up within the walls due to condensation.
b. Examine all potential moisture condensation points considering insulation, vapor barriers and dew point position.
c. Ensure that all internal sources of humidity are properly ventilated.

4.4 Heat Island Control

a. Consider installing new or replacing existing roofs with highly reflective ENERGY STAR compliant and high emissivity roofing.
b. Consider vegetated roofs.

4.5 Heat Loss through Stack Effect Control

a. Seal building areas between floors, stairwells, corridors, and elevator shafts to reduce convective heat losses through stack effect.
b. Plan air pressure relationships between rooms as appropriate (i.e., laboratories).
c. Detail for ductwork and fireplaces (where applicable) to reduce convective heat loss and for energy efficiency.

C. Building Mechanical Systems

Principle: Design mechanical lighting, heating and cooling systems to minimize energy use and emission of greenhouse gases.

Principle: Create a comfortable and healthy indoor environment.

C.1.0 Alternative Energy Sources

Evaluate use of the following as a means to reduce energy use from conventional sources.

a. Passive solar.
b. Solar hot water.
c. Ground source heat pump systems.
d. Using daylight where possible as an alternative to electric lighting.
e. Expanded cogeneration operations.
f. Energy conserving devices like economizers and air pre-heaters to reclaim sensible heat losses in waste air streams.

C.2.0 Heating Ventilation and Air Conditioning Systems

Existing space heating on the campus is accomplished in the following ways: steam heat, hydronic heating as well as distributed air handling systems. Consideration should be given to the following:

2.1 Heating

a. Engineer systems to meet actual heating loads and not theoretical loads.
b. Use of existing building energy management systems to control heating equipment.
c. Design for specific occupancy.
d. Use zoned heating distribution systems.

2.2 Equipment

a. Use air handling equipment with low air infiltration and high efficiency.
b. Use high efficiency boilers.
c. Use high efficiency hot water heating equipment.
d. Use heating equipment that resets on outside air.
e. Use VAV (variable air volume) systems where appropriate.
f. Use VFD (variable frequency drives) for fans and pumps.
g. Use quality thermal system insulation practices.

2.3 Cooling

Existing air conditioning equipment on the MHC campus consists of central distributed chilled water, air cooled electric chillers, direct expansion is used in some large air distribution systems as well as used in small window air conditioning units.

a. Connect to chilled water system when feasible.
b. Use energy efficient cooling equipment with a low kilowatt to ton of cooling ratio (NPLV).
c. Engineer systems to meet actual cooling loads and not theoretical loads.
d. Design for specific occupancy.
e. Use only refrigerants that are known to have low environmental impact such as R123 or 134a.

2.4 Ventilation

a. Consider installation of CO_2 sensors to control ventilation rates.
b. Meet or exceed the institutional rate for outdoor air ventilation.
c. Design systems to comply with Ashrae 90.1 and 129-1997 for mechanical ventilation.
d. Design systems to prevent mold/moisture problems.

C.3.0 Domestic Hot Water

a. Use high efficiency and energy star rated hot water heaters.
b. Engineer replacement hot water heaters to ensure the unit is not oversized.
c. Locate replacement hot water heaters as close as possible to eliminate heat loss due to long runs of piping.
d. Insulate existing and replacement hot water piping.
e. Use low flow shower heads.

C.4.0 Energy Management

a. Connect energy controls to the College's Energy Management System. At this time the following platforms will be considered: Andover, Andover Continuum and Automated Logic.
b. Local energy management systems should be user friendly to ensure full participation of staff that may from time to time be involved with energy related decisions.

D. Electrical Power and Lighting Systems

D.1.0 Interior and Exterior Lighting

1.1 Interior Lighting Levels

a. Use energy efficient electrical fixtures. T-8 lamps should be the minimum acceptable lighting fixture with stronger preference being given to T-5's.
b. Use fluorescent lights where possible.
c. Use only LED exit lights.

1.2 Energy Conservation Interior Lighting

a. Connect lighting controls to building energy system.
b. Locate multi-level switching with the end user in mind.
c. Install occupancy sensors where appropriate while considering daylight compensation.

1.3 Exterior Lighting Levels

a. Use the campus standard Kim high-pressure sodium light fixtures that prevent light pollution for all pedestrian and roadway lighting.
b. Use the energy management system to control on/off times.

D.2.0 Efficient Power Distribution

a. Use distribution voltage at either 13,800 volts or 4,160 volts.
b. Check electrical distribution equipment with infrared scanning/testing routinely.
c. Avoid electric resistance heating equipment.
d. Explore cogeneration.
e. Use K rated when replacing transformers.
f. Use VFD (variable frequency drives) for motors over 10 hp.
g. Use super E motors when making electric motor replacements.

E. Water Use and Efficiency

Principle: Minimize potable water use by mechanical systems, building occupants, and for exterior landscaping.

E.1.0 Water Conservation

a. Use low flow toilets and urinals as referenced in the Massachusetts Plumbing Code.
b. Use of spring return water faucets or proximity sensors on all fixtures.
c. Consider innovative ways to reclaim ground water, gray water and storm water runoff to replace use of potable water.
d. Maintain an active metering practice for all potable water use on campus.
e. Evaluate use of composting toilets, particularly in remote locations that do not have existing infrastructure.

F. Materials and Resources

Principle: Use building materials that minimize the life cycle environmental impact of those materials.

Principle: Minimize waste generation during the construction process and maximize reuse and recycling.

Principle: Create a comfortable and healthy indoor environment.

F.1.0 Waste Prevention

1.1 Use of Existing Structures

a. When feasible, renovate existing buildings instead of demolition and new construction.
b. Maintain or reuse the existing structural components and furnishings.

1.2 Efficient Material Use and Waste Prevention

a. Design spaces efficiently to meet program needs while minimizing space requirements.
b. Reduce material use through structural design.
c. Design to accommodate future needs.
d. Design for disassembly and reuse if function is expected to change over time.
e. Use durable products extending life expectancy.

1.3 Reuse of Materials

a. Review the existing structure to determine what elements should be deconstructed instead of demolished and maximize reuse of materials.
b. Use salvaged materials from other sources on-campus or external.

1.4 Building Operations

a. Design the building to encourage the occupants to reduce waste and recycle.
b. At a minimum, provide dedicated recycling areas with adequate space for recycling containers on each floor of the building.
c. Provide adequate space for centralized storage of recyclables prior to pick-up and unobstructed access to this area by removal personnel.

d. Clearly label recycling areas and containers.

F.2.0 Environmentally Responsible Materials

2.1 Regional Materials

a. Establish project goals for regional materials manufactured or harvested within a 500-mile radius and use when feasible.

2.2 Recycled Content

a. Establish project goals and specifications for recycled content materials using consensus standards referenced by LEED™.
b. Consider alternative materials to plywood (e.g., composite board).
c. Consider composite products made from recycled materials.

2.3 Certified Wood

a. Establish project goals and specifications for use of Forest Stewardship Council (FSC) certified wood materials.
b. Reduce the use of large timbers.
c. Avoid materials containing toxic preservatives such as ammonium copper quaternium (ACQ), copper hydroxide sodium dimethyldithiocarbamate (CDDC), or arsenical preservatives.

2.4 Rapidly Renewable Building Materials

a. Establish project goals and specifications for rapidly renewable materials (plants typically harvested within a 10 year life cycle) using consensus standards referenced by LEED™.
b. Consider rapidly renewable materials such as linoleum, cork or bamboo flooring, and poplar Oriented Straw Board (OSB).

G. Indoor Environmental Quality

Principle: Create a comfortable and healthy indoor environment.

G.1.0 Air Contaminant Source Control

a. Establish project goals and specifications for low VOC materials including paints, adhesives, sealants, composite wood products and floor coverings based on the low VOC consensus standards referenced by LEED™.
b. Collect and review MSDS and/or manufacturer certifications for all materials.
c. Identify sources of contaminants and odors that will be generated by the use of the area and adequately ventilate those spaces.

G.2.0 Indoor Air Quality Systems Performance

a. Consider natural ventilation strategies in HVAC design and exterior window and wall openings to reduce reliance on mechanical ventilation (e.g., cross ventilation through narrow floor plates, solar chimneys or other types of stack ventilation).
b. Consider providing operable windows with appropriate HVAC interlocks (consider the deficits of operable windows, which may compromise the efficiency and maintenance of central systems).
c. Consider fan-powered night ventilation in lieu of operable windows (must be enthalpy-controlled to avoid introducing excessive humidity in the building).
d. Design for maximum benefit from economizer cooling in mechanical systems.
e. Identify heat sources that will be generated by the use of the area and adequately ventilate those spaces.

G.3.0 Noise Control

a. Use structural design methods and appropriate surfaces to control noise transmission and achieve the acoustical performance needed for the space use.

III. Environmentally Responsible Green Building Construction Guidelines

A. Resource Protection During Construction

Principle: Minimize and control water runoff from the site to prevent degradation of Stony Brook and Upper and Lower Lakes.

A.1.0 Resource Protection Plan

a. Develop a Resource Protection Plan identifying important natural resources and detailing methods that minimize the impact of construction on those areas.
b. Fence protected areas before any work begins, and maintain throughout construction, until all construction and clean-up is complete. All fenced areas should be completely off-limits including foot traffic.
c. Minimize site disturbance, including earth work and clearing of vegetation in establishing the contract limit line and specifying acceptable activities within that line and designate in the Resource Protection Plan.
d. Specify details on the agreed upon restoration of the site post construction.

A.2.0 Equipment Access and Use

a. Construction access should coincide with planned or existing permanent roadways or pedestrian walkways.
b. Use appropriate construction machinery. Available equipment varies widely in size, weight, energy consumption, and clean or pollution-prone operation. These factors affect the site directly and influence staging and access areas, as well as site protection.
c. Prevent construction traffic from crossing or entering wetlands.

A.3.0 Materials Storage, Work Areas, and Parking

a. Avoid soil compaction by limiting on-site stockpiling and parking and choosing staging carefully.
b. Establish specific, limited areas for cutting and drilling materials (e.g., metal, plastic, concrete, stone, treated wood, sawdust).
c. All parking, staging, and work areas must be designated in the Resource Protection Plan.

A.4.0 Top Soil Preservation

a. Remove topsoil from disturbed areas of site, store on-campus in covered storage piles.
b. Reuse as needed for project and leave any remaining topsoil for future campus use.

A.5.0 Storm Water Management

5.1 Design a site-specific Sediment and Erosion Control Plan that conforms to EPA or local standards and controls, whichever is more stringent.

5.2 All projects must adhere to MHC's "Storm Water Management Best Management Practices" and any additional permitting requirements established.

a. No work can be done in a wetland resource area including riverfront protection areas and wetland buffer zones without prior approval from the FM resource protection area coordinator. Each College vehicle will carry a copy of the protection area map, and each site work contractor will be given a copy of the map before commencing work.
b. All site work disturbing more than 1 acre requires a Storm Water Permit. All permitting is coordinated by the FM resource protection area coordinator.
c. Schedule/phase work to minimize exposed soil.
d. Cover all excavated soil, at the end of each workday and during rain or threatened rain events until it is reused or removed from the site.
e. Install and maintain silt fences around all areas with exposed soil. Alternative methods must be approved by the FM resource protection area coordinator.
f. Install and maintain a "sock" in every catch basin in the vicinity of a site work project.
g. Inspect silt fences and catch basin inserts at least weekly and after each rain event keeping a log of inspections.
h. Avoid placing soil piles on paved surfaces.
i. Divert rainwater around soil piles on pavement (e.g., sandbag the upslope side of the soil pile).
j. Hydroseed, or soil tackify as soon as possible on all sloped exposed soil areas.
k. Filter any water pumped from an excavation before discharge to a catch basin.
l. Maintain on-site a spill clean-up kit that includes several bags of absorbent and a temporary catch basin cover.
m. All hazardous material releases, including oil, must be reported immediately to Facilities Management at ext. 2012 or after hours to Public Safety at 1911.

n. Any costs incurred by the College associated with spills will be charged back to the responsible contractor.
o. Place a tarp under all generators and compressors to catch any petroleum release. Any released material must be absorbed and disposed of as hazardous waste.
p. Remove all vehicles and equipment from wetland resource areas including riverfront areas and wetland buffer zones at the end of every business day.
q. Design storm water collection systems to introduce storm water runoff back into the soil where soil conditions allow. If recharge not feasible, diverted runoff to storm water collection systems to prevent overland flow to water bodies.

B. Environmental Quality

Principle: Create a comfortable and healthy indoor environment.

B.1.0. Site Protection and Health and Safety

1.1 Site Protection/Health and Safety Plan

a. Develop a Site Protection/Health and Safety Plan that includes methods to be used during construction to control hazards and nuisances on-site and off-site, to establish a perimeter to control access to the site, and to adequately light the site and surrounding area.

1.2 Low VOC Materials

a. Comply with project goals and specifications for low VOC materials including paints, adhesives, sealants, composite wood products and floor coverings based on the low VOC consensus standards referenced by LEED^{TM}.
b. Collect and review MSDS and/or manufacturer certifications for all materials.

1.3 Hazardous Materials Control

a. Comply with all federal, state and local regulations regarding removal and disposal of hazardous materials from the site (e.g., lead contaminated debris, asbestos, hazardous waste including waste oil, universal waste).
b. Do not release any hazardous materials or other chemicals into storm drains or surface drainage.
c. Coordinate all lead and asbestos and universal waste removal with Facilities Management and all hazardous waste removal with the Office of Safety and Risk Management.
d. Prior to completion, survey the building and site to ensure that no chemicals or other hazardous materials related to construction remain on-site.

1.4 Noise Control

a. Work with Facilities Management to establish requirements for construction noise control based on the needs of the occupants and surrounding community.

1.5 Site Lighting

a. Work with Facilities Management to establish requirements for site lighting based on the needs of the occupants and surrounding community.

1.6 Perimeter Control

a. Establish a plan for securing the site from unauthorized access including fencing location and type, access points, and routine inspection procedures to ensure security.

C. Materials and Resources

Principle: Minimize waste generation during the construction process and maximize reuse and recycling.

C.1.0 Recycling and Disposal of Construction and Demolition Debris

a. Develop a Waste Management Plan that details the segregation and reuse/recycling requirements for each type of construction debris. The Plan should include all categories of waste, specifically designating any hazardous materials or waste, disposition of the waste, destinations, and tracking methods that will be used.
b. Recycle materials for which there is a local market.
c. Evaluate the feasibility of recycling materials in regional markets.

C.2.0 Housekeeping

a. Areas for collection of recyclables and trash should be designated within the site and enclosed to the extent necessary to prevent movement off the site by wind and rain.
b. All debris and trash will be cleaned-up at least daily.
c. No materials, other than non-contaminated rainwater or groundwater, are allowed to enter the storm drain system.
d. Any washing of concrete must be done in a designated area, identified on the Resource Protection Plan, where the water will flow into a settling area and the residual removed from the site along with any concrete spoils.
e. Any hazardous materials and waste generated must be in accordance with regulations and documentation provided to the College.

IV. Deliverables

A. Pre-Design

Principle: Introduce environmental responsibility early in the planning process.

Principle: Hire architects, engineers, and construction managers with experience in environmental design and construction and work collaboratively to achieve project goals.

A.1.0 Green Strategies Workshop

On projects of any significant size at Mount Holyoke College, a multi-disciplinary kick-off workshop shall be held. Purpose of the Workshop will be to create a road map for the project team to follow. This goal setting Workshop will identify green strategies and performance targets for this particular project. Also, it will be determined if formal certification will be sought for the project. Recognizing that good green design comes from a team driven approach, designers from all disciplines will be expected to participate in the kick-off Workshop – landscape, civil, electrical, mechanical, plumbing, architectural, interiors, etc.

A.2.0 Performance Plan

Based on the Workshop, the Design team will be responsible for a delivering a "Performance Plan" which summarizes all environmental and energy performance targets for the project, together with the strategies elected from this guideline to meet those benchmarks. Performance Plan shall consist of two parts: 1) A narrative of the design intent; 2) A checklist of goals and strategies being considered for the project. The Design Team shall prepare the Performance Plan.

B. Design

Principle: Use life cycle costing to evaluate building cost.

B.1.0 Performance Plan Updates

During design, the Design Team shall be responsible for updating the Performance Plan so that it comprises a record of design intent and decision-making with respect to energy and environmental principles. Using the Performance Plan, the Design Team will provide explanatory notes for changes in strategies and deviation from performance targets and effectively justify non-compliance with the original performance targets.

B.2.0 Submittals

a. Environmental Site Analysis: Site plan indicating solar path, prevailing winds, and other climate information relevant to design.

b. Design Energy Use Targets: Performance goals for operating energy use and costs. Goals for lighting and power density, for the project as a whole and for all typical major spaces.

c. HVAC Systems Alternative Plan Narrative: Alternative plans being considered and their impact on the architecture.

d. Building Massing Alternatives Plan: Analysis of alternative massing, orientation, layouts.

e. Green Material Specifications: Prepare material specifications that reflect design decisions made throughout the design process.

f. Resource Protection Plan: Prepare a Resource Protection Plan as described in section III.A.1.0.

g. Site Protection/Health and Safety Plan: Develop any site-specific requirements for inclusion in a Plan covering such issues as noise mitigation, dust control, and odor control as described in section III.B.1.0.

h. Waste Management Plan: Develop a Waste Management Plan as described in section III.C.1.0. Provide language requiring General Contractor to make all efforts to divert construction demolition, land-clearing debris from landfill disposal and redirect recyclable material back to appropriate waste handlers.

i. Life Cycle Cost Analysis: The Design team shall be responsible for preparing a summary of the anticipated Life Cycle Cost of the proposed building. Elements of the summary shall include: design and construction costs, energy costs using some agreed upon estimate of inflation, and assuming a 100 year model.

All of the above Plans are the responsibility of the Design Team.

C. Construction

Facilities Management Project Manager shall take care in the bidding phase to ensure that potential General Contractors are aware of Mount Holyoke College's commitment to Green initiative. Towards that end, the PM shall make sure that at the Pre-Bid conference that the bidders understand their responsibilities regarding:

Waste Management
Health and Safety
Site Management and Protection

D. Systems Review/Commissioning

Principle: Use building commissioning to evaluate systems and ensure performance standards are met.

On large projects a formal building commission process should be used to ensure all systems are operating as designed. Environmental performance should be a highlighted objective of that process. On smaller projects, a less formal systems review should be conducted.