

GB GUIDELINES



GREEN BUILDING GUIDELINES

UNIVERSITY OF MASSACHUSETTS AMHERST

LEED FOR NEW CONSTRUCTION V3 2009

JUNE 2011



ACKNOWLEDGEMENTS



These guidelines have been prepared by the Green Building Committee, which is chaired by Jim Cahill, Director of Facilities Planning. The committee took a credit by credit approach to analyzing campus infrastructure, policies and practices as they pertain to green building and LEED certification.

It is our hope that these guidelines will help facilitate and streamline the LEED certification process for new construction and major renovations at the University of Massachusetts Amherst (UMA). In addition, by using these guidelines as a framework for green building, we hope that design teams will be able to challenge the University with creative, resourceful and innovative strategies for sustainable buildings on campus.

These guidelines are not meant to replace the LEED manual. The information herein, in conjunction with maps and references available through Facilities Planning, is meant to support design teams in their understanding of the UMA campus through the lens of LEED. However, it is the responsibility of each design team to ensure that they fully comprehend the LEED rating system, credit requirements, and associated reference materials. Contact Facilities Planning for more information.

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TABLE OF CONTENTS

INTRODUCTION	I
II Preface	
III Acknowledgements	
VI Executive Summary	
VIII Principals	
X Priority Feasibility Checklist	
XIII Credit Key	
SUSTAINABLE SITES	1
3 SSp1: Construction Activity Pollution Prevention	
4 SS1: Site Selection	
6 SS2: Development Density + Community Connectivity	
8 SS3: Brownfield Redevelopment	
10 SS4.1: Alternative Transportation - Public Transportation Access	
12 SS4.2: Alternative Transportation - Bicycle Storage and Changing Rooms	
14 SS4.3: Alternative Transportation - Low-Emitting and Fuel-Efficient Vehicles	
15 SS4.4: Alternative Transportation - Parking Capacity	
16 SS5.1: Protect or Restore Habitat	
17 SS5.2: Site Development - Maximize Open Space	
18 SS6.1: Stormwater Design - Quantity Control	
20 SS6.2: Stormwater Design - Quality Control	
21 SS7.1: Heat Island Effect - Non-Roof	
22 SS7.2: Heat Island Effect - Roof	
23 SS8: Light Pollution Reduction	
WATER EFFICIENCY	25
26 WEp1: Water Use Reduction	
27 WE1: Water Efficient Landscaping	
28 WE2: Innovative Wastewater Technologies	
29 WE3: Water Use Reduction	
ENERGY + ATMOSPHERE	31
32 EAp1: Fundamental Commissioning of Building Energy Systems	
33 EAp2: Minimum Energy Performance	
34 EAp3: Fundamental Refrigerant Management	
35 EA1: Optimize Energy Performance	
36 EA2: On-Site Renewable Energy	
37 EA3: Enhanced Commissioning	
38 EA4: Enhanced Refrigerant Management	
39 EA5: Measurement and Verification	
40 EA6: Green Power	

MATERIALS + RESOURCES	43
44 MRp1: Storage and Collection of Recyclables	
45 MR1.1: Building Reuse - Maintain Existing Walls, Floors, and Roof	
46 MR1.2: Building Reuse - Maintain 50% of Interior Non-Structural Elements	
47 MR2: Construction Waste Management	
48 MR3: Materials Reuse	
49 MR4: Recycled Content	
50 MR5: Regional Materials	
51 MR6: Rapidly Renewable Materials	
52 MR7: Certified Wood	
INDOOR ENVIRONMENTAL QUALITY	55
56 IEQp1: Minimum Air Quality Performance	
57 IEQp2: Environmental Tobacco Smoke (ETS) Control	
58 IEQ1: Outdoor Air Delivery Monitoring	
59 IEQ2: Increased Ventilation	
60 IEQ3.1: Construction Indoor Air Quality Management Plan: During Construction	
61 IEQ3.2: Construction Indoor Air Quality Management Plan: Before Occupancy	
62 IEQ4.1: Low-Emitting Materials – Adhesives and Sealants	
63 IEQ4.2: Low-Emitting Materials – Paints and Coatings	
64 IEQ4.3: Low-Emitting Materials – Flooring Systems	
65 IEQ4.4: Low-Emitting Materials – Composite Wood and Agrifiber Products	
66 IEQ5: Indoor Chemical and Pollutant Source Control	
67 IEQ6.1: Controllability of Systems – Lighting	
68 IEQ6.2: Controllability of Systems – Thermal Comfort	
69 IEQ7.1: Thermal Comfort - Design	
70 IEQ7.2: Thermal Comfort - Verification	
71 IEQ8.1: Daylight and Views - Daylight	
72 IEQ8.2: Daylight and Views - Views	
REGIONAL PRIORITY	74
77 RP1-4: Regional Priority	
INNOVATION IN DESIGN	78
81 Guidelines for Innovation	
82 Exemplary Credits	
84 Pilot Credits	
86 LEED Accredited Professional	



EXECUTIVE SUMMARY

BACKGROUND

In 2007, University of Massachusetts President Jack Wilson signed the American College and University Presidents' Climate Commitment. The same year, University of Massachusetts Amherst (UMA) Chancellor Thomas Cole established the Environmental Performance Advisory Committee (EPAC) to assess ways to reduce the environmental impacts of the campus. In 2008, Governor Deval Patrick signed Executive Order 484 which included the provision that all state buildings be certified under the LEED rating system. At the same time, UMA made the commitment to achieve LEED-Silver or better for all new construction and major renovations. In 2010, EPAC created the Green Building Committee (GBC) to focus efforts on sustainable design and building on campus.

During the summer of 2010, the GBC - a cross disciplinary group comprised of faculty, staff, and students - met biweekly to produce a document which is based on, but not limited to, the LEED-NC 2009 rating system. The committee reviewed the LEED credits and prerequisites and established priority and feasibility levels for each based on the environmental realities and mission of the University. A narrative summary of background information and campus-specific research was created for each category, credit, and prerequisite. The final report and slide presentation summarize the current knowledge and points of view from many UMA stakeholders, and are critical tools in the effort to advance sustainability through high performance buildings on campus.

PURPOSE

These guidelines provide a framework for approaching new construction and major renovation at UMA by focusing the conversation on the aspects of green building most important to the campus. They are intended to be the beginning of a dynamic conversation between designers, UMA stakeholders, and users of new buildings. LEED points are not the end goal of these guidelines; rather, they will be a by-product of the design of high performance buildings.

The process of sustainable design extends well beyond the scope of these pages. However, they help define a common starting point for the design process. Project teams may consider the research and discussion provided here to be a baseline from which to begin their investigation.

GUIDELINES FOR INNOVATION

Over the course of writing these guidelines, certain sustainable design concepts have emerged again and again as items which are especially important to the University. Design teams are expected to carefully consider the following as they define the project's green building goals:

- Engage users to challenge and expand the limits of the human comfort zone.
- Share project data with the campus for research and education.
- Generate opportunities for future education about sustainable living and working.

CHALLENGE DESIGNERS TO CHALLENGE US

The Green Building Committee challenges designers to challenge the University by presenting new ways of building that are increasingly sustainable and which promote the various missions of the institution. The design team's role is to deepen UMA's commitment to and understanding of green building techniques and technology through detailed investigation and innovative research.

PROTECT THE NATURAL ENVIRONMENT

UMA's commitment to the natural environment has been articulated in a variety of venues including the Presidents' Climate Commitment and the Climate Action Plan (CAP). Successful building design should address greenhouse gas emissions, fossil fuel usage, impact on the plant and animal life surrounding the UMA campus, and educating the community about proper stewardship.



PRINCIPLES

OVERARCHING PRINCIPLES

Throughout the analysis of the LEED-NC rating system, the GBC returned to a few overarching principles that influenced the priority designations of each credit. Out of the 60 credits, 29 were identified as high priorities. Each of these credits relate to more than one of the overarching principles. The principles include:

MAXIMIZE DURABILITY AND MINIMIZE MAINTENANCE COSTS

Buildings at UMA are expected to last a very long time and serve hundreds of thousands of students, staff, and faculty throughout their lifetime.

- SS6.1: Stormwater Design - Quantity Control
- WE1: Water Efficient Landscaping
- WE3: Water Use Reduction
- EA3: Enhanced Commissioning
- EA5: Measurement and Verification
- MR7: Certified Wood
- IEQ3.1: Construction IAQ Management Plan - During Construction
- IEQ3.2 Construction IAQ Management Plan - Before Occupancy
- IEQ4.1: Low-Emitting Materials - Adhesives and Sealants
- IEQ4.2: Low-Emitting Materials - Paints and Coatings
- IEQ4.3: Low-Emitting Materials - Flooring Systems
- IEQ4.4: Low-Emitting Materials - Composite Wood and Agrifiber Products
- IEQ5: Indoor Chemical and Pollutant Source Control

REDUCE ENERGY CONSUMPTION

The financial costs and environmental impacts of energy use should be minimized throughout the construction and operations of UMA's buildings.

- WE3: Water Use Reduction
- EA1: Optimize Energy Performance
- EA2: On-Site Renewable Energy
- EA3: Enhanced Commissioning
- EA5: Measurement and Verification
- MR2: Construction Waste Management
- IEQ1: Outdoor Air Delivery Monitoring
- IEQ7.1: Thermal Comfort - Design
- IEQ7.2: Thermal Comfort - Verification
- RP1.2: Regional Priority (EA2)

SUPPORT ACADEMIC RESEARCH

New construction should serve UMA's various areas of research. Faculty across campus are actively engaged in fields closely tied to Green Building.

- SS6.2: Stormwater Design - Quality Control
- WE1: Water Efficient Landscaping
- EA1: Optimize Energy Performance
- EA2: On-Site Renewable Energy
- MR7: Certified Wood
- IEQ1: Outdoor Air Delivery Monitoring

PROMOTE INTERCONNECTED CAMPUS COMMUNITY

The UMA community is enhanced by densifying the core campus, promoting pedestrian and bicycle circulation, and strengthening the relationships between buildings and open space.

- SS2: Development Density + Community Connectivity
- SS4.1: Alternative Transportation - Public Transportation Access
- SS4.2: Alternative Transportation - Parking Capacity
- SS5.2: Site Development - Maximize Open Space
- IEQ3.1: Construction IAQ Management Plan - During Construction

CONTROL STORMWATER RUNOFF

The UMA stormwater utility system has reached maximum capacity and is beginning to fail. Flooding occurs across campus after major storm events and almost all surface flow is funneled to one culvert that runs underneath the southern end of Commonwealth Avenue. Future projects must meet capacity of their stormwater needs on site or add capacity to the system.

- SS5.2: Site Development - Maximize Open Space
- SS6.1: Stormwater Design - Quantity Control
- SS6.2: Stormwater Design - Quality Control
- RP1.1: Regional Priority (SS6.1)

PRIORITY | FEASIBILITY CHECKLIST

Priority			Feasibility						
Low	Med	Hi	Easy	Mod	Diff				
Category: Sustainable Sites Points: 26									
Required		Required							
1				1					
		5	5						
	1			1					
		6	6						
		1		1					
	3			3					
		2		2					
1						1			
		1	1						
		1		1					
	1								
1						1			
1						1			

Priority			Feasibility						
Low	Med	Hi	Easy	Mod	Diff				
Category: Water Efficiency Points: 10									
Required		Required							
		4	4						
	2					2			
2		2						4	

Priority			Feasibility						
Low	Med	Hi	Easy	Mod	Diff				
Category: Energy and Atmosphere Points: 35									
Required		Required							
4	10	5	5	10	4				
6		1			7				
		2	2						
	2			2					
		3		3					
2			2						

Priority			Feasibility						
Low	Med	Hi	Easy	Mod	Diff				
Category: Materials and Resources Points: 14									
Required		Required							
	3			3					
1					1				
		2		2					
2					2				
	2			2					
	2			2					
1					1				
		1		1					

Priority			Feasibility						
Low	Med	Hi	Easy	Mod	Diff				
Category: Indoor Environmental Quality Points: 15									
Required		Required							
		1	1						
1					1				
		1	1						
		1		1					
		1		1					
		1		1					
		1	1						
		1		1					
		1	1						
	1				1				
		1		1					
		1	1						
	1				1				
1					1				

Priority			Feasibility						
Low	Med	Hi	Easy	Mod	Diff				
Category: Innovation and Design Points: 6									
Required		Required							
		5	5						
		1	1						

Priority			Feasibility						
Low	Med	Hi	Easy	Mod	Diff				
Category: Regional Priority Points: 4									
Required		Required							
		1	1						
		1			1				
	1				1				
	1				1				

4	5	17	16	8	2	Sustainable Sites	26
2	2	6	4	0	6	Water Efficiency	10
12	12	11	9	15	11	Energy and Atmosphere	35
4	7	3	2	8	4	Materials and Resources	14
2	3	10	5	10	0	Indoor Environmental Quality	15
0	0	6	1	5	0	Innovation and Design	6
0	2	2	0	3	1	Regional Priority	4
24	31	55	37	49	24	TOTAL	Points: 110

40-49: Certified
 50-59: Silver
 60-79: Gold
 80-100: Platinum

High Priority Credit as defined by Green Building Guidelines

X



SUSTAINABLE SITES

WATER EFFICIENCY

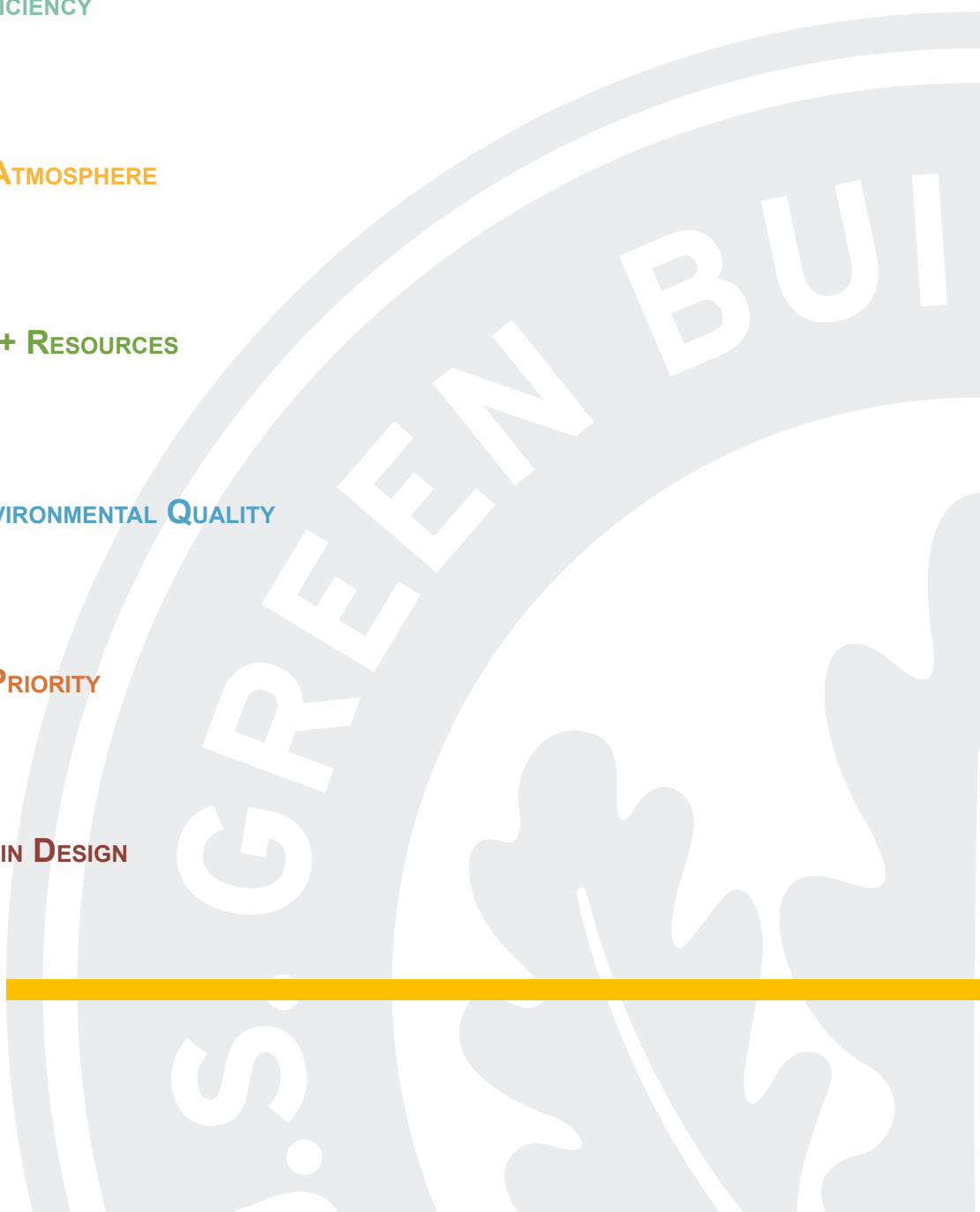
ENERGY + ATMOSPHERE

MATERIALS + RESOURCES

INDOOR ENVIRONMENTAL QUALITY

REGIONAL PRIORITY

INNOVATION IN DESIGN



SS CATEGORY

SUSTAINABLE SITES FINDINGS

- The campus includes 27,000 students, 6,000 faculty/staff on 1,348 acres. The peak density is 23.7 people/acre.
- The campus has 10,000 parking spots.
- 5% of commuters currently arrive to the campus by bicycle. (CAP)
- 29% of UMA employees currently use the bus –up from 17 % in 1999. (Framework Plan)
- The campus' underground stormwater infrastructure was built in the 1800s.
- Stormwater on the campus generally flows east to west.
- 72% of the campus is pervious and 28% is impervious.
- If the existing surface parking lots were combined in one location, the paved land area would be nearly the size of the academic core.
- The annual average precipitation at UMA is 45.57 Inches, and the wettest month of the year is May with an average rainfall of 4.11 inches.



SUSTAINABLE SITES

With a population of 32,000 students, faculty, and staff, UMA is essentially a small city nestled in the rural hills of Western Massachusetts. The campus has an urban feel, complete with tall buildings (including the 26 story W.E.B. DU Bois Library) and a complex web of pedestrian, vehicular, and shared pathways. At the same time, it is part of the rural fabric of the area, surrounded by open farmland and upland forest.

UMA has a robust site planning process which views the campus as a network. Site selection decisions are driven by relationships to adjacent buildings, district planning, vehicular circulation and access, the quality of open space, and program. With the exception of stormwater issues, individual environmental considerations are less of a priority than the overall feel, look, and flow of the campus. However, many of the LEED credits in this category will be automatically earned by projects because of high density and existing transportation infrastructure.

The University has significant resources to assist design teams in understanding the complexities of site selection, including a series of GIS maps calling out LEED compliance for many of the Sustainable Sites credits.

POSSIBLE POINTS: 26

17 HIGH PRIORITY	16 EASY FEASIBILITY
5 MEDIUM PRIORITY	8 MODERATE FEASIBILITY
4 LOW PRIORITY	2 DIFFICULT FEASIBILITY

CONSTRUCTION ACTIVITY POLLUTION PREVENTION

SS PREREQUISITE 1

REQUIRED

LEED CREDIT INTENT

To reduce pollution from construction activities by controlling soil erosion, waterway sedimentation and airborne dust generation.

LEED CREDIT REQUIREMENTS

Create and implement an erosion and sedimentation control plan for all construction activities associated with the project. The plan must conform to the erosion and sedimentation requirements of the 2003 EPA Construction General Permit OR local standards and codes, whichever is more stringent. The plan must describe the measures implemented to accomplish the following objectives:

- To prevent loss of soil during construction by stormwater runoff and/or wind erosion, including protecting topsoil by stockpiling for reuse.
- To prevent sedimentation of storm sewers or receiving streams.
- To prevent pollution of the air with dust and particulate matter.



UMA CREDIT DISCUSSION

The prevention of construction activity pollution is crucial on campus both for its environmental impact and because the campus is constantly in use by students, faculty and staff. Design teams are expected to include provisions for the control of erosion, sedimentation and airborne dust in their drawings and specifications.

SITE SELECTION

SS CREDIT 1

1 POINT

LOW PRIORITY | MODERATE FEASIBILITY

LEED CREDIT INTENT

To avoid the development of inappropriate sites and reduce the environmental impact from the location of a building on a site.

LEED CREDIT REQUIREMENTS

Do not develop buildings, hardscape, roads or parking areas on portions of sites that meet any of the following criteria:

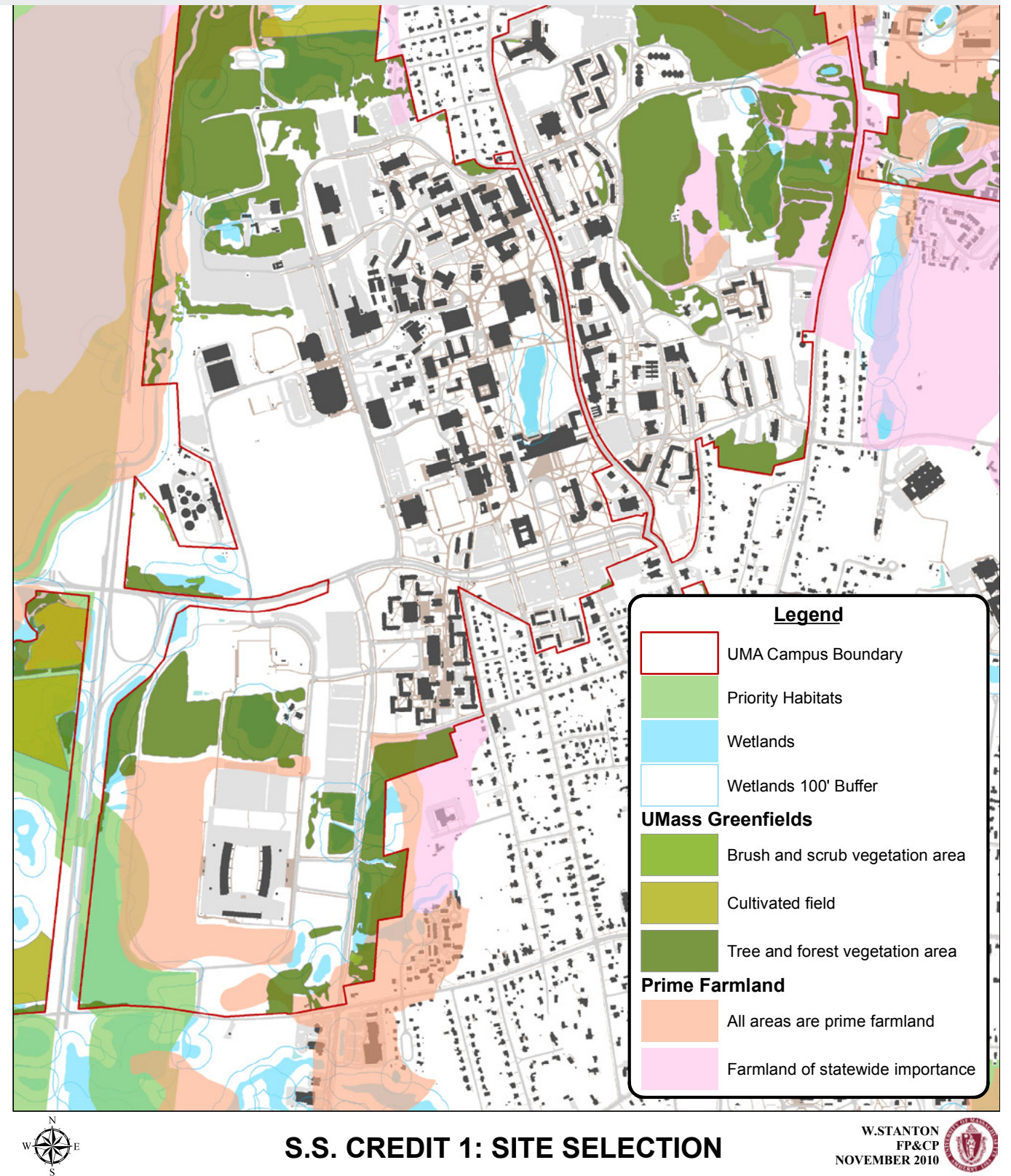
- Prime farmland (soil classification)
- Low-lying land (previously undeveloped)
- Endangered or threatened species habitat
- Wetlands: 100 ft buffer
- Water bodies: 50ft buffer (previously undeveloped)
- Parkland

UMA CREDIT DISCUSSION

AT UMA, building sites are selected by design teams primarily for their proximity to similarly programmed buildings and their alignment with the campus master plan.

The preservation of farmland is a low priority for the core of campus, thus a soil classification of prime farmland by the USDA should not preclude a project team from choosing a particular site although it will eliminate the potential for earning this LEED credit. Similarly, existence of an endangered species or location of a water body should not preclude the use of a site for a future project, although the project design should respond, when possible, to the environmental features of the site and to the educational potential therein.

The feasibility of this credit is site dependant. Many of the potential building sites on campus fulfill all of the criteria of the credit because they do not meet any of the LEED definitions for inappropriate sites.



S.S. CREDIT 1: SITE SELECTION

W.STANTON
FP&CP
NOVEMBER 2010

DEVELOPMENT DENSITY + COMMUNITY CONNECTIVITY

SS CREDIT 2

HIGH PRIORITY | EASY FEASIBILITY

1 POINT

LEED CREDIT INTENT

To focus development to urban areas with existing infrastructure, protect greenfields and preserve habitat and natural resources.

LEED CREDIT REQUIREMENTS

Construct or renovate a building on a site that meets the following criteria:

Option 1: Development Density

- Is located on a previously developed site
- In a community with a minimum density of 60,000 square feet per acre net.

Option 2: Community Connectivity

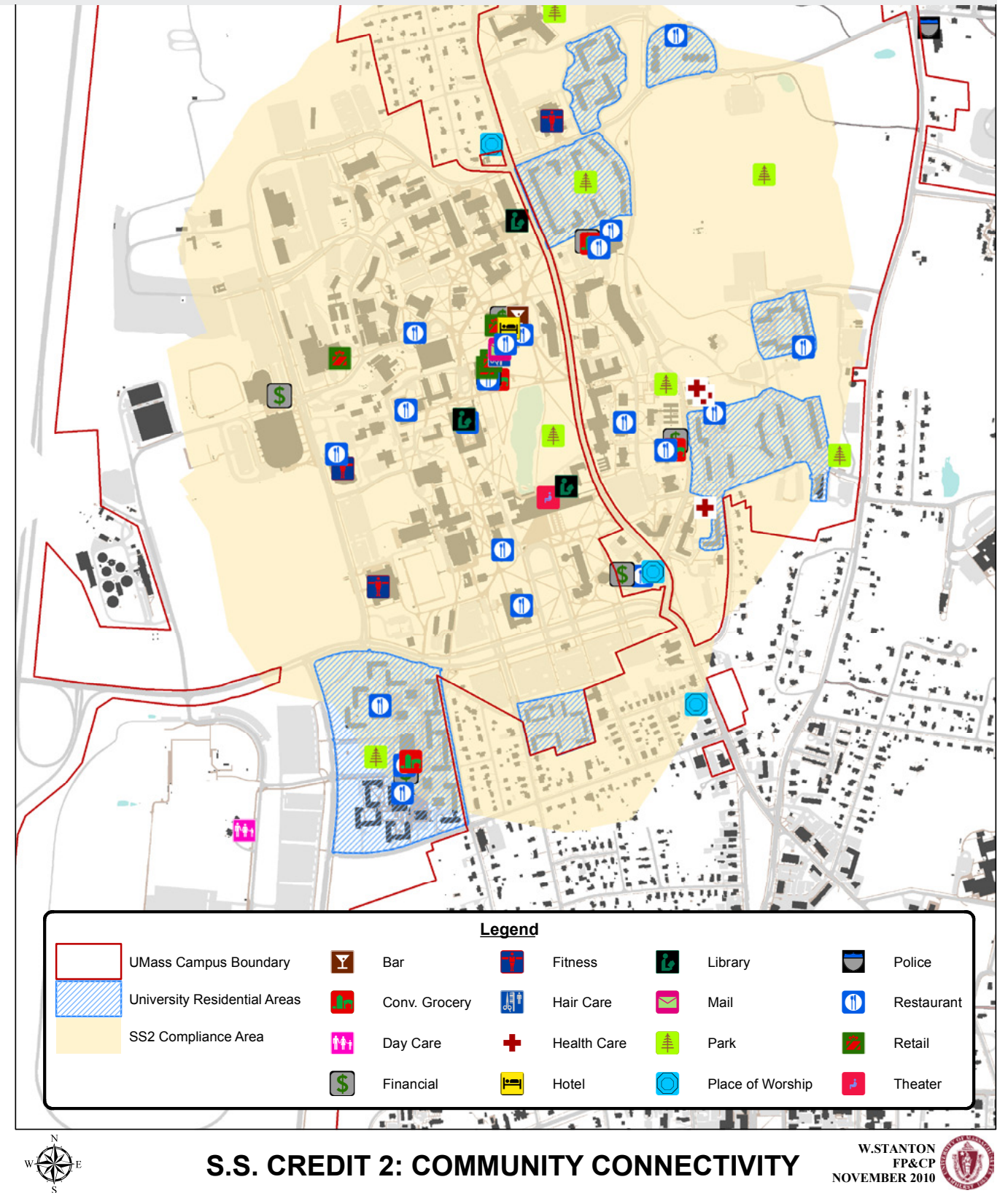
- Is located on a previously developed site
- Is within ½ mile of a residential area or neighborhood with an average density of 10 units per acre net
- Is within ½ mile of at least 10 basic services
- Has pedestrian access between the buildings and services

UMA CREDIT DISCUSSION

The requirements for this LEED credit are consistent with many of the priorities for campus development. Pedestrian movement and open space should predominate. Placing residential areas in close proximity to basic services (including cafes, restaurants, post offices, gyms, and banks) supports the development of an urban campus, encourages bicycle and pedestrian travel and reduces the need for individual vehicle use.

Most of the core campus meets the requirements for Option 2: Community Connectivity and design teams should confirm that this is the case for potential building sites.

¹ Campus Landscape Improvement Plan (CLIP)



BROWNFIELD REDEVELOPMENT

SS CREDIT 3
1 POINT + 1 (REGIONAL PRIORITY)

MEDIUM PRIORITY | MODERATE FEASIBILITY

LEED CREDIT INTENT

To rehabilitate damaged sites where development is complicated by environmental contamination and to reduce pressure on undeveloped land.

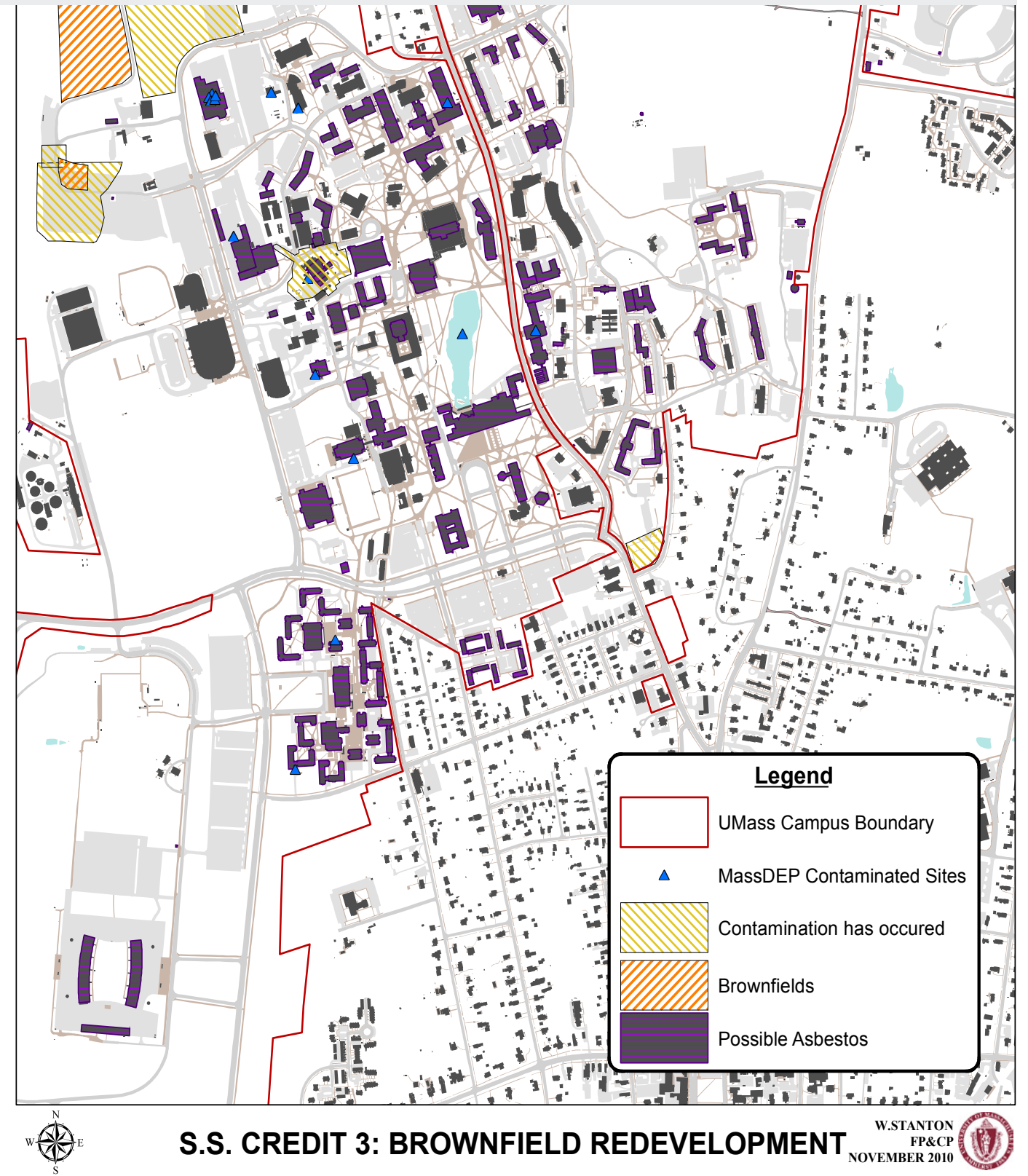
LEED CREDIT REQUIREMENTS

Remediate and develop on a site documented as at least one of the following:

- Contaminated
- Brownfield
- Containing Asbestos

UMA CREDIT DISCUSSION

At UMA, building sites are selected by design teams primarily for their proximity to similarly programmed buildings and for their alignment with the campus master plan, not because they are, or are not, contaminated. However, if a preferred project site was found to contain hazardous materials, remediation would be required.



ALTERNATIVE TRANSPORTATION - PUBLIC TRANSPORTATION ACCESS

SS CREDIT 4.1
6 POINTS + 1 (EXEMPLARY)

HIGH PRIORITY | EASY FEASIBILITY

LEED CREDIT INTENT

To reduce pollution and land development impacts from automobile use by locating new construction in close proximity to existing public transportation.

LEED CREDIT REQUIREMENTS

Locate the project within 1/4 mile of at least 1 stop for 2 bus lines

Projects may earn an additional point for exemplary performance by complying with both of these requirements:

- Locate the project within 1/4 mile of at least 2 or more stops for 4 or more public or campus bus lines usable by building occupants.
- Demonstrate that the frequency of service is at least 200 total transit rides per day.



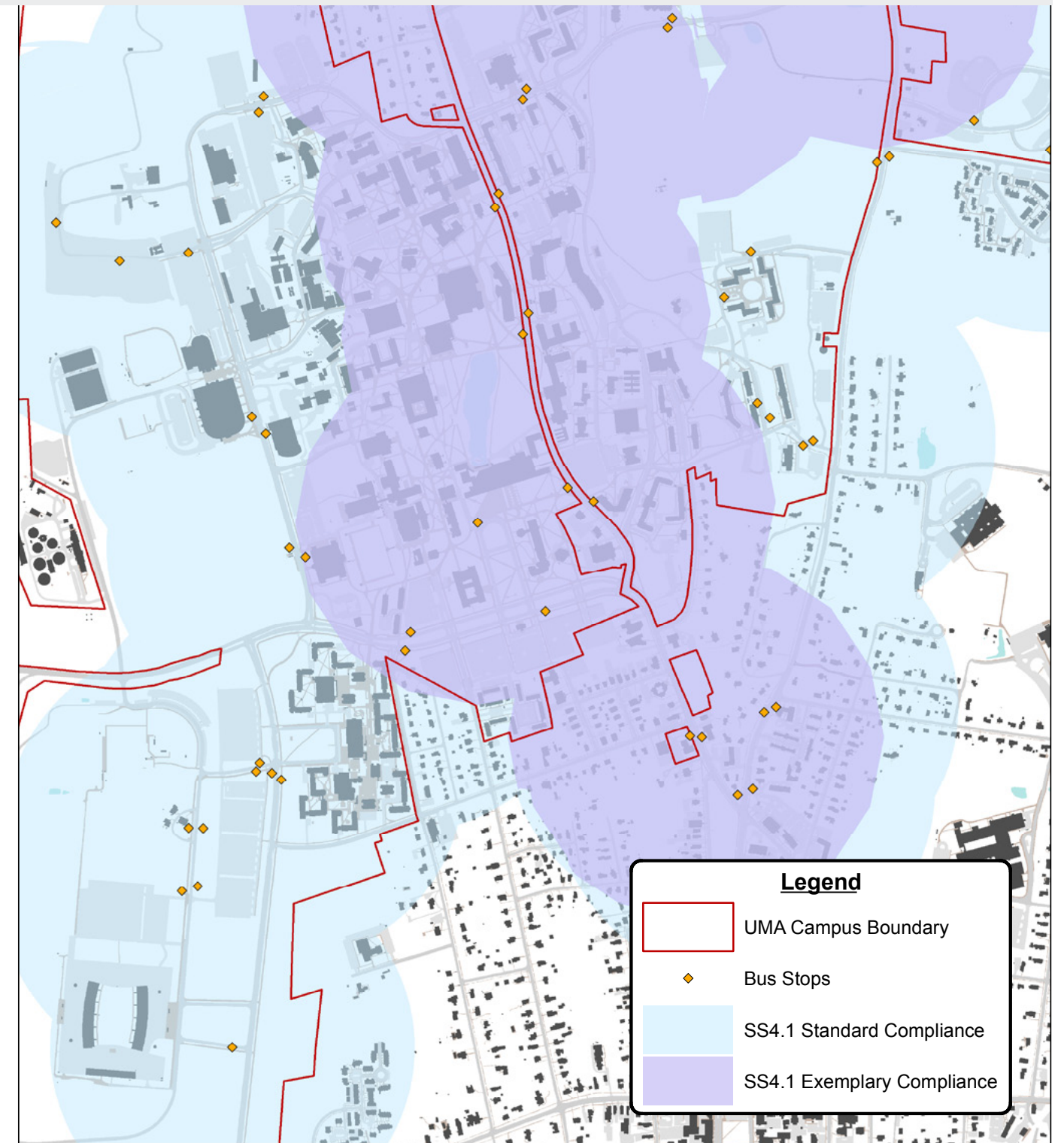
HASBROOK BUS STOP: 7 BUS LINES, 191 STOPS PER DAY

UMA CREDIT DISCUSSION

At UMA, public transportation is a high priority. Currently, there are approximately 10,000 parking spaces on campus and 33,000 students, faculty and staff, a figure which emphasizes the need for a reduction in the use of single-occupancy vehicles. Reducing greenhouse gas emissions is also a high priority for the University, due in part to Executive Order 484. The University's Climate Action Plan states a series of Mitigation Strategies to curb campus transportation-related emissions including implementing and enhancing public transportation. Major campus buildings that serve students should have a nearby transit stop within 500 feet of the entrance.¹ Close proximity of new projects to bus stops is both crucial to campus development and supported at the University and State levels.

All of the core campus currently meets the requirements stated above. Furthermore, for projects outside of the campus core, precedent has been set for the building of additional bus stops when they don't yet exist.

¹ UMA Design Guidelines



Legend

- UMA Campus Boundary
- Bus Stops
- SS4.1 Standard Compliance
- SS4.1 Exemplary Compliance



S.S. CREDIT 4.1: PUBLIC TRANSPORTATION

W.STANTON
FP&CP
NOVEMBER 2010

ALTERNATIVE TRANSPORTATION - BICYCLE STORAGE AND CHANGING ROOMS

SS CREDIT 4.2
1 POINT

HIGH PRIORITY | MODERATE FEASIBILITY

LEED CREDIT INTENT

To reduce pollution and land development impacts from automobile use by encouraging bicycle commuting.

LEED CREDIT REQUIREMENTS

- Commercial
 - Provide secure bicycle racks within 200 yards of a building entrance for 5% or more of all building users
 - Provide shower and changing facilities within 200 yards of a building entrance for 0.5% of FTE occupants
- Residential
 - Provide covered bicycle storage for 15% of occupants



BICYCLE STORAGE AREA,
LEDERLE GRADUATE RESEARCH CENTER



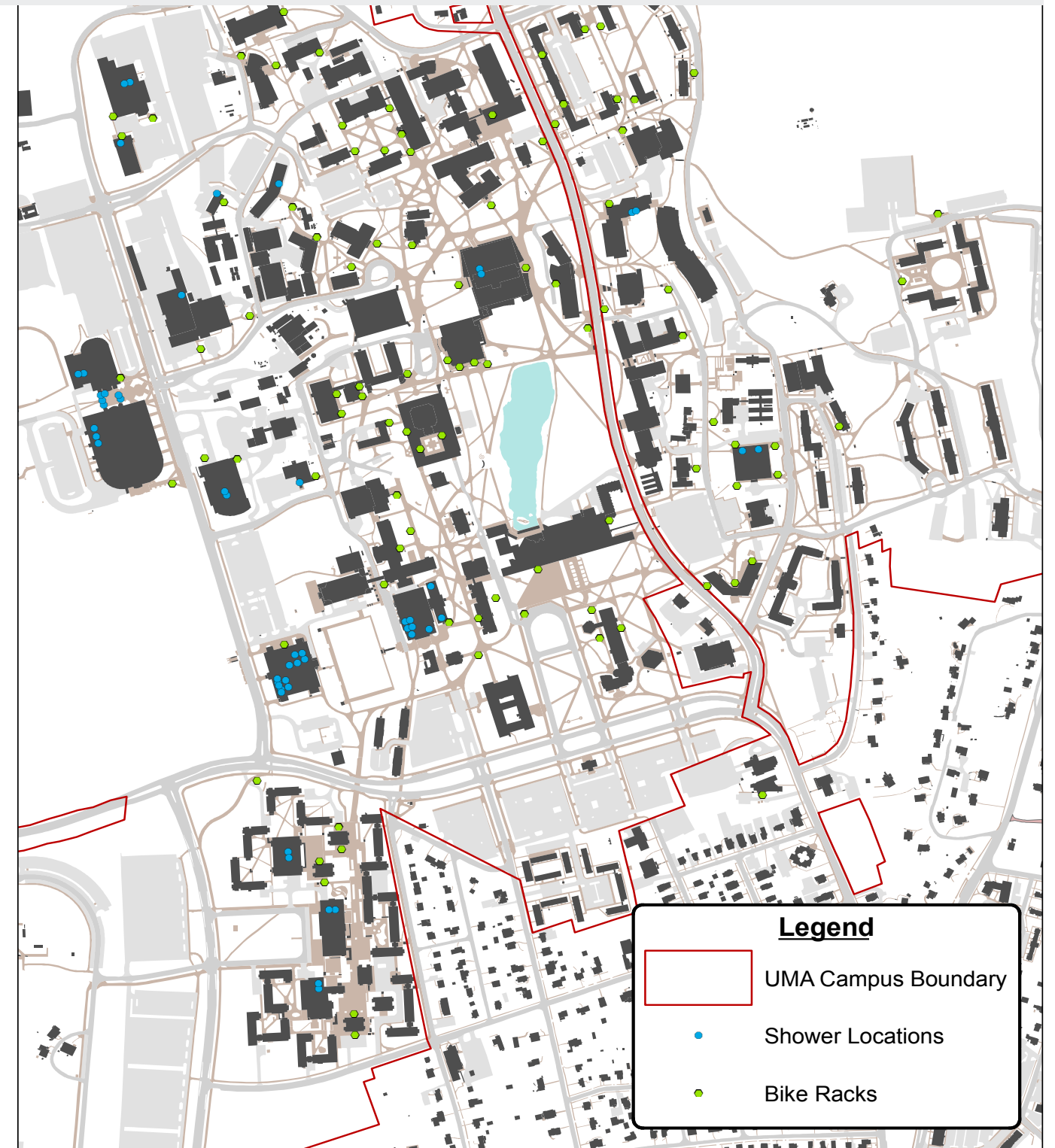
BICYCLIST AND CAMPUS POND

UMA CREDIT DISCUSSION

The University is committed to encouraging bicycle commuting through the expansion and proliferation of racks and access to lockers/showers¹. 5% of commuters currently arrive to the campus by bicycle². An additional number of vehicle-owning students use bicycles for day-to-day travel. Increasing the number of bike racks and available showers on campus incentivizes the use of bicycles as a primary mode of transportation, promotes a healthy lifestyle, and is aligned with the master plan goal of a pedestrian core campus. It is a goal of the University to go beyond the requirements of this LEED credit.

All of the core campus is within 200 yards of bike storage, however, design teams should include bike storage as part of their project's building and landscape design³. The inclusion of showers and changing rooms for new projects should be assessed on a case by case basis; project teams will be provided with a map of existing shower/changing facilities to use in this decision-making process.

¹ UMA Design Guidelines, ² Climate Action Plan, ³CLIP



Legend

- UMA Campus Boundary
- Shower Locations
- Bike Racks



S.S. CREDIT 4.2: BIKE STORAGE & SHOWERS

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FP&CP
NOVEMBER 2010

ALTERNATIVE TRANSPORTATION - LOW-EMITTING AND FUEL-EFFICIENT VEHICLES

SS CREDIT 4.3
3 POINTS

MEDIUM PRIORITY | EASY FEASIBILITY

LEED CREDIT INTENT

To reduce pollution and land development impacts from automobile use by incentivizing the use of low-emitting and fuel-efficient vehicles (LEV/FEV).

LEED CREDIT REQUIREMENTS

Option 1: Provide a discount of no less than 20% off parking pass rates for low emitting and fuel efficient vehicles (LEV/FEV)

- Available to all customers
- Publicly posted at entrance to the parking lot
- Available for at least two years

Option 2: Install alternative-fuel fueling stations for 3% of total parking capacity.

Option 3: Provide LEV/FEV for 3% of FTE occupants.

Option 4: Provide occupants with access to an LEV/FEV sharing program.'

University of Massachusetts Amherst

PARKING SERVICES

Home My Account Permits Citations General Info

Clean Vehicle Permits

Discounted parking permits are available for hybrid, electric, compressed natural gas (cng), liquefied petroleum gas (lpg), and bi-fuel vehicles.

UMASS is now offering discounted parking permits for "clean" vehicles (EPA Smartway Elite Vehicles). This discount is intended to encourage the use of "clean" vehicles and reward those commuters already doing their part to reduce the environmental impact of the automobile. This discount is a two year discount of 20% off your annual parking permit. The Clean Vehicle Permit discount cannot be combined with other discounted programs including Occasional Parker Permits and Carpool permits.

The UMASS Commuter Options Program is designed to meet Massachusetts Department of Environmental Protection guidelines under the Air Quality Program. Please call or visit Parking Services to take advantage of this special rate.

Updated: 06/09/11

[HTTP://PARKING.UMASS.EDU/INDEX.PHP/PERMITS/CLEANVEHICLE](http://parking.umass.edu/index.php/permits/cleanvehicle)

UMA CREDIT DISCUSSION

The University has been tasked with reducing greenhouse gas emissions by 25% by fiscal year 2012.¹ Offering incentives for low-emitting and fuel-efficient vehicle use can help achieve this, however, it's likely that a greater impact on emissions will be realized through other methods.

Parking Services offers discounts to LEV/FEV users, using a list of LEED compliant vehicles. The discount of 50% for one year technically exceeds the LEED requirement of a 20% discount for two years. A Credit Interpretation Ruling will need to be sought to confirm that this discount structure will work for the credit. Coordination will need to happen between the project teams and parking services to ensure that notification of the discount is publicly posted.

¹ Executive Order 484

ALTERNATIVE TRANSPORTATION - PARKING CAPACITY

SS CREDIT 4.4
2 POINT + 1(EXEMPLARY)

HIGH PRIORITY | MODERATE FEASIBILITY

LEED CREDIT INTENT

To reduce pollution and land development impacts from automobile use.

LEED CREDIT REQUIREMENTS

Option 1: Parking capacity must not exceed minimum local zoning requirements. [Not Applicable at UMA]

Option 2: Provide parking for less than 5% of full-time equivalent building occupants:

- Provide preferred carpool parking for 5% of total parking spaces, or
- Provide parking discounts for carpoolers.

Option 3: Provide no new parking

Option 4: Provide 25% fewer parking spaces than the applicable standard listed in the 2003 ITE "Parking Generation" study.



UMA CREDIT DISCUSSION

Parking is a huge issue for UMA, with 80% of employees and 50% of students driving to the campus in single-occupant vehicles. Existing parking lots within the core campus are common sites for new construction because they occupy some of the only flat areas. A current mandate requires the campus to replace each removed spot with a new spot on the periphery. Incentivizing carpooling is one method of encouraging alternate forms of transportation on campus.

In terms of feasibility, the Parking Services provides discounts for carpoolers – 50% off of the regular parking cost each year, for an infinite number of years. Whether or not parking is provided for less than 5% of FTEs will be project-dependant. Design teams are encouraged to fully explore parking options.

PROTECT OR RESTORE HABITAT

SS CREDIT 5.1

LOW PRIORITY | DIFFICULT FEASIBILITY

1 POINT + 1 (EXEMPLARY)

LEED CREDIT INTENT

To conserve existing natural areas and restore damaged areas to provide habitat and promote biodiversity.

LEED CREDIT REQUIREMENTS

Cover 50% of the site (excluding building-footprint) or 20% of entire site with native or adapted vegetation

“Native or adapted vegetation” is defined as plants indigenous to a locality or cultivars of native plants that are adapted to the local climate and are not considered invasive species or noxious weeds.

A green roof can count towards this credit, provided it is planted with a diversity of native or adapted species.

Projects may earn an additional point by restoring or protecting a minimum of 75% of the site (excluding building footprint) or 30% of the site (including building footprint.)



STOCKBRIDGE HALL NATIVE VEGETATION GARDEN

UMA CREDIT DISCUSSION

Pursuing this credit will require a culture shift on campus. Current emphasis is placed on presenting a welcome and polished landscape to multiple audiences characterized by mowable turf grass. Physical Plant has begun using native, hardy plants in gardens and is replacing annuals with perennials, and UMA plantings should be “simple, robust, and indigenous” and be as maintenance-free as possible.¹ However, designating 50% of the building site for native plantings is unlikely for projects on the core campus where multi-purpose outdoor spaces are a higher priority.

¹ Campus Landscape Improvement Plan (CLIP)

SITE DEVELOPMENT - MAXIMIZE OPEN SPACE

SS CREDIT 5.2

HIGH PRIORITY | EASY FEASIBILITY

1 POINT + 1 (EXEMPLARY)

LEED CREDIT INTENT

To promote biodiversity by providing a high ratio of open space to development footprint.

LEED CREDIT REQUIREMENTS

Provide vegetated open space adjacent to the building that is equal in area to the building footprint. Vegetated open space includes:

- Lawn
- Playing field
- Pedestrian-oriented hardscapes
- Plantings
- Green Roofs

Owner must sign a form stating that the open space will remain open space for the life of the building.

Projects may earn an additional point for doubling open space requirements.



MARCUS HALL

UMA CREDIT DISCUSSION

The design of outdoor spaces surrounding campus buildings should be as thorough as the design of the buildings themselves.¹ Emphasis should be placed on the development of programmed outdoor spaces, and visitors should have lingering images of a green, healthy, well-maintained landscape. Pedestrian movement and open space should predominate, where possible. This credit is achievable unless the size of the site is not twice the size of the building footprint. Project teams should take care in considering this when choosing the LEED project boundary.

¹ UMA Design Guidelines

STORMWATER DESIGN - QUANTITY CONTROL

SS CREDIT 6.1

1 POINT + 1 (EXEMPLARY)

HIGH PRIORITY | MODERATE FEASIBILITY

LEED CREDIT INTENT

To limit disruption of natural hydrology by reducing impervious cover, increasing on-site infiltration, reducing or eliminating pollution from stormwater runoff and eliminating contaminants.

LEED CREDIT REQUIREMENTS

For sites with imperviousness less than 50%:

- The post-development peak discharge rate must not exceed pre-development rate

For sites with imperviousness greater than 50%:

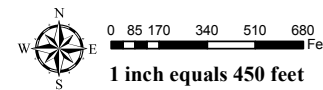
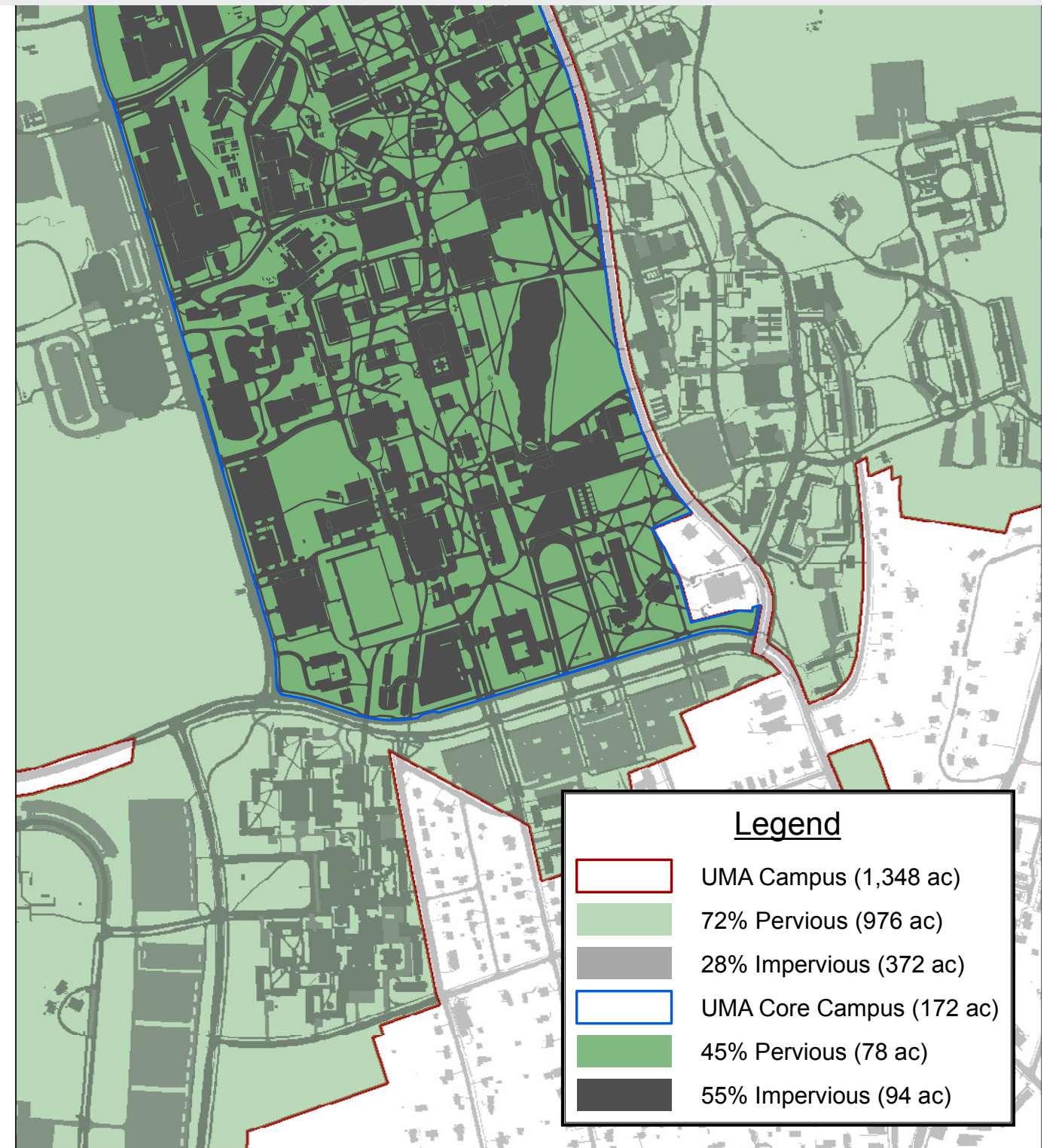
- Storm water runoff must be reduced by 25% for the 2-year 24-hour (3") design storm



RAIN GARDEN, LOT 62/STUDIO ARTS BUILDING

UMA CREDIT DISCUSSION

UMA compliance for this credit will be driven primarily by MassDEP regulations. The existing stormwater system is overburdened; managing stormwater quantities on campus is a priority. The use of retention ponds is highly limited on the core campus due to space constraints; however, UMA is beginning to experiment with on-site infiltration using rain gardens and bioswales. Underground storage of water for reuse in cooling and wastewater systems is another strategy that should be investigated by design teams.



Pervious/Impervious Map

WSTANTON
FP&CP
OCTOBER 2010



STORMWATER DESIGN - QUALITY CONTROL

SS CREDIT 6.2
1 POINT + 1 (EXEMPLARY)

HIGH PRIORITY | MODERATE FEASIBILITY

LEED CREDIT INTENT

To limit disruption of and pollution of natural water flows by managing stormwater runoff.

LEED CREDIT REQUIREMENTS

- Capture and treat runoff from 90% of annual rainfall.
- Remove 80% of the average annual post-development total suspended soils load based on existing monitoring reports.

Projects may earn an exemplary point by going well beyond the credit requirements and documenting a comprehensive approach to capture and treat stormwater runoff.



SOUTHWEST CONCOURSE RENOVATION

UMA CREDIT DISCUSSION

UMA compliance for this credit will be driven primarily by MassDEP regulations. The existing stormwater system is overburdened; managing stormwater quantities on campus is a priority. The use of retention ponds is highly limited on the core campus due to space constraints; however, UMA is beginning to experiment with on-site infiltration using rain gardens and bioswales. Underground storage of water for reuse in cooling and wastewater systems is another strategy that should be investigated by design teams.

HEAT ISLAND EFFECT - NON-ROOF

SS CREDIT 7.1
1 POINT + 2 (REGIONAL PRIORITY/EXEMPLARY)

MEDIUM PRIORITY | EASY FEASIBILITY

LEED CREDIT INTENT

To reduce heat islands to minimize impacts on microclimates and human and wildlife habitats.

LEED CREDIT REQUIREMENTS

At least 50% of the site hardscape must be either shaded, or have a solar reflectance index (SRI) of at least 29.

Projects may earn an exemplary point if 100% of the site hardscape is shaded or has an SRI of at least 29 or if 100% of the on-site parking spaces have been located under cover.



CAMPUS CONCRETE PATH

UMA CREDIT DISCUSSION

At UMA, a balance is sought between having green, leafy spaces and allowing for views and a neat campus appearance. For this reason, the shading option of this credit may not be viable for many sites. However, the campus specifies the use of standard concrete - which has an SRI of 35 - for pedestrian paths and patio areas to provide a clear distinction from vehicular circulation as well as to reduce heat island effect.¹

¹ Campus Design Standards

HEAT ISLAND EFFECT - ROOF

SS CREDIT 7.2

1 POINT + 1 (EXEMPLARY)

LOW PRIORITY | MODERATE FEASIBILITY

LEED CREDIT INTENT

To reduce heat islands to minimize impacts on microclimates and human and wildlife habitats.

LEED CREDIT REQUIREMENTS

Install roofing materials that have an SRI of at least:

- Low-sloped roof = 78
- Steep-sloped roof = 29

Or

- Install a vegetated roof that covers at least 50% of the roof area.

Projects may earn an exemplary point if 100% of the roof is vegetated.



PHYSICAL PLANT ROOF, UMASS AMHERST



FORD MOTOR COMPANY, DEARBORN, MI

UMA CREDIT DISCUSSION

At UMA, roofing choice is highly dependent on project budget and building use. Mitigating the heat island effect on roofs is not a high priority for the campus. Additionally, the energy savings of light-colored roofs in northern climates is debatable.

UMA currently has limited interest in installing experimental roofs, including vegetated systems.

LIGHT POLLUTION REDUCTION

SS CREDIT 8

1 POINT

LOW PRIORITY | DIFFICULT FEASIBILITY

LEED CREDIT INTENT

To minimize light trespass from the building and site, reduce sky-glow, improve nighttime visibility, and reduce impact on nocturnal environments.

LEED CREDIT REQUIREMENTS

Reduce the input power of all interior non-emergency luminaires with a direct line of sight to any openings in the envelope by at least 50% between 11:00 pm and 5:00 am.

- After-hours override may be provided by a manual or occupant-sensing device.

Light exterior areas only as required for safety and comfort. Lighting power densities must not exceed:

- Lz3: Medium - Building-mounted luminaires produce a maximum initial illuminance less than 0.6 horizontal and vertical foot-candles at the site boundary.



UMA CLIP SPECIFIED LIGHT FIXTURE (NON-COMPLIANT)

UMA CREDIT DISCUSSION

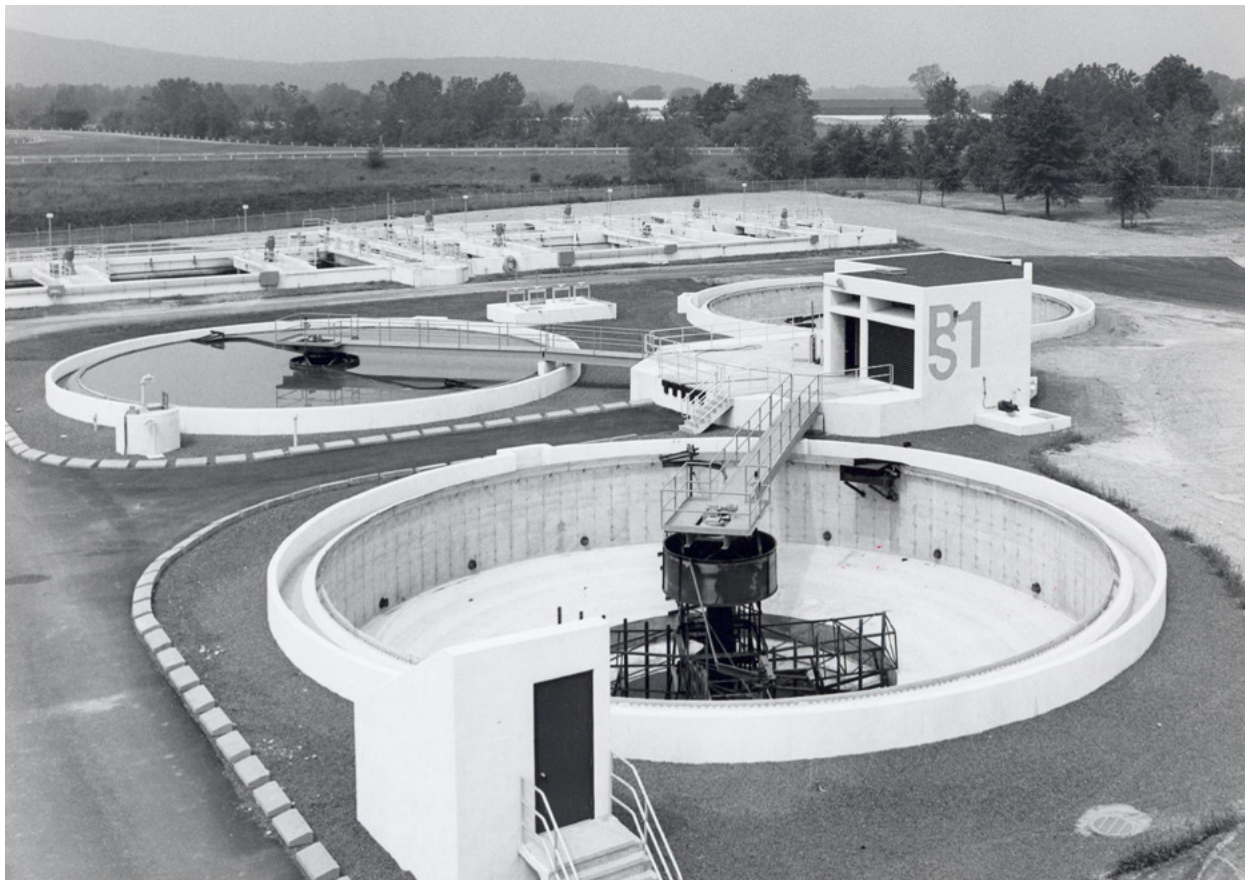
Night lighting plays a large role in making the UMA campus more inviting, both enhancing the usability of outdoor spaces and improving safety. This LEED credit requires an adherence to a lighting power density threshold as well as provisions to prevent “sky glow”. CLIP standards call for a lighting power density (watts/sf) that does not comply with LEED. Additionally, the campus currently specifies a lighting fixture that may not comply with LEED requirements because it illuminates above 90 degrees.¹ However, depending on the project, it may be possible to comply with the requirements for this credit. Credit compliant light fixtures may be recommended as a new campus design standard.

¹ UMA Design Guidelines

WE CATEGORY

WATER EFFICIENCY FINDINGS

- The reduction in campus potable water use over the three year period was due to the water conservation measures installed by Johnson Controls as part of an energy saving contract initiated in 2003:
 - FY07 = 27,391,551 gallons
 - FY08 = 26,055,152 gallons
 - FY09 = 25,379,406 gallons
- Potable water consumption since the Johnson ontrols retrofit continues to rise with the campus population.
 - FY10 = 26,426,605 gallons
- 200,000 gallons of reclaimed water are used in the campus' central heating plant.



MUNICIPAL WASTEWATER TREATMENT PLANT, 1979. AMHERST, MASSACHUSETTS

WATER EFFICIENCY

UMA is part of a temperate forest climate, characterized by four distinct seasons and a good deal of precipitation spread evenly throughout the year. However, periodic drought periods plague the Western Massachusetts region, the most recent occurring in the summer of 2010, where rainfall was 5 inches less than the average for the period. Although the price of water is relatively low in this part of Massachusetts, the University recognizes it is an increasingly precious resource, and its abundance cannot be taken for granted. Design teams are expected to emphasize water efficiency for all campus projects.

The University's potable water comes from the Town of Amherst, sourced from several wells and reservoirs in the area. An effluent line is expected to be utilized in the near future for make-up water to cooling towers within the campus core.

Various strategies for water use and reduction should be considered for new projects, and a combination of strategies may have the biggest impact within the constraints of budget and scope. Particularly with bathroom fixture selection, water efficiency goals should to be balanced with maintenance, durability, and user experience.

Design teams are encouraged to model water use throughout the design phase to analyze consumption and conservation strategies.

POSSIBLE POINTS: 10	6 HIGH PRIORITY 2 MEDIUM PRIORITY 2 LOW PRIORITY	4 EASY FEASIBILITY 0 MODERATE FEASIBILITY 6 DIFFICULT FEASIBILITY
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WATER USE REDUCTION

WE PREREQUISITE 1

REQUIRED

LEED CREDIT INTENT

To increase water efficiency within buildings to reduce the burden on municipal water supply and wastewater systems.

LEED CREDIT REQUIREMENTS

Employ strategies that in aggregate use 20% less water than the water use baseline calculated for the building (not including irrigation).

Calculations are based on occupant usage and must include only the following fixtures and fixture fittings:

- Water Closets
- Urinals
- Lavatory Faucets
- Showers
- Kitchen Sink Faucets
- Pre-rinse Spray Valves



ATKINS RESERVOIR

UMA CREDIT DISCUSSION

At UMA, water use reduction is a high priority. The campus gets its potable water from the Town of Amherst, whose water comes from seven sources in the watershed (both wells/aquifers and reservoirs). In 1980, drought-like conditions coupled with the return of the student body and a cluster of unseasonably hot days caused a water crisis that culminated in the evacuation of the campus. This event and the potential for its reoccurrence stress the importance of water savings for the University.

Flush and flow fixtures for all University projects must meet the requirements of this LEED prerequisite, which stipulates a 20% reduction over code. Lavatory faucets with automatic controls and low-flow showerheads can be easily implemented. Toilets that meet LEED criteria, with an efficiency of 1.28 gpf, have been shown to be very effective at removing waste from the bowl. However, pipe slope and arrangement of other water-using appliances in the pipe stream can affect the conveyance of waste through the pipes.¹ It is crucial that fixture decisions be made as part of an integrative approach between architects and plumbing engineers to ensure performance optimization.

¹ Alliance for Water Efficiency

WATER EFFICIENT LANDSCAPING

WE CREDIT 1

2-4 POINTS

HIGH PRIORITY | EASY FEASIBILITY

LEED CREDIT INTENT

To limit or eliminate the use of potable water or other natural surface or subsurface water resources available on or near the project for site landscape irrigation.

LEED CREDIT REQUIREMENTS

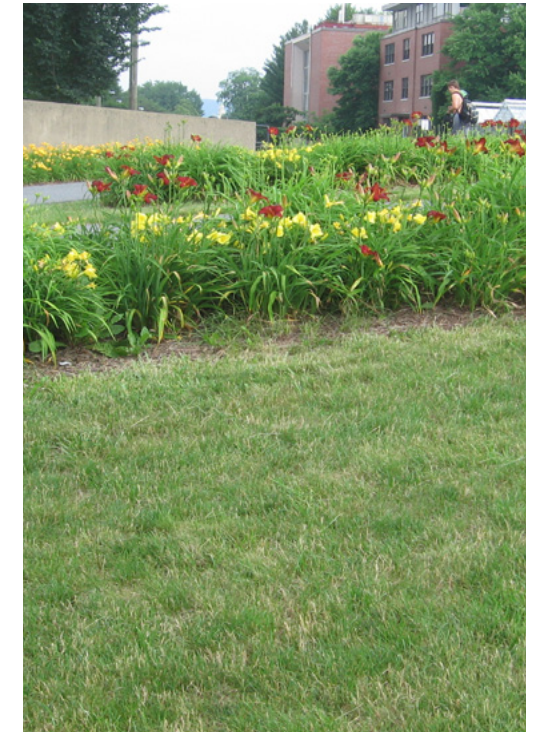
Option 1: Reduce by 50% (2 points)

- Reduce potable water use for irrigation by 50% from a calculated midsummer baseline case.

Option 2: No Potable Water Use for Irrigation (4 Points)

Meet the requirements for Option 1 and,

- Path 1
 - Use only recaptured rainwater, recycled wastewater, graywater or other municipally supplied non-potable water.
- Path 2
 - Install landscaping that does not require permanent irrigation systems.
 - Temporary irrigation systems used for plant establishment are allowed only if removed within 1 year of installation.



FINE ARTS CENTER PLANTING

UMA CREDIT DISCUSSION

The University is situated in a temperate forest climate, characterized by four distinct seasons and a good deal of precipitation which is evenly spread throughout the year. Temperate forest climates are second only to rainforest climates for total annual rainfall. UMA landscaping is designed specifically for this climate. With a few exceptions, the campus landscape is not irrigated, and robust plantings and drought-resistant turf grass is used.¹

For the most part, project teams should always design landscaping that does not require permanent irrigation. In select cases, and usually for educational purposes, gardens might be designed which require irrigation. In these cases, use of small rainwater harvesting systems should be explored. Project teams should integrate landscape, building, and stormwater treatment design to ensure the optimization of such a system.

¹ Campus Landscape Improvement Plan (CLIP)

INNOVATIVE WASTEWATER TECHNOLOGIES

WE CREDIT 2
2 POINTS + 2 (REGIONAL/EXEMPLARY)

MEDIUM PRIORITY | DIFFICULT FEASIBILITY

LEED CREDIT INTENT

To reduce wastewater generation and potable water demand while increasing the local aquifer recharge.

LEED CREDIT REQUIREMENTS

Reduce potable water use for building sewage conveyance (toilet/urinal flushing) by 50% through:

- The use of water-conserving fixtures, i.e. toilets and urinals or,
- Non-potable water, through captured rainwater or cooling system condensate or municipal treated wastewater

Projects can earn an exemplary point for 100% sewage conveyance by non-potable means.



LOW-FLOW FIXTURE

Fixture	Uses/Day	Baseline Gallons/Flush	Baseline Gallons/Day	High Efficiency Gallons/Flush	High Efficiency Gallons/Day
Toilet	40	x 1.6	= 64	1.28	= 51.2
Urinal	20	x 1	= 20	0	= 0
TOTAL			84		51.2

Savings	=	39%
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UMA CREDIT DISCUSSION

Most likely, a 20% reduction in water use by flush fixtures will be attained by project teams due to the requirements of the water use reduction prerequisite. However, even by implementing waterless urinals and high efficiency (1.28 gpf) toilets, the average project will achieve only a 39% savings for flush fixtures, not the 50% required by this credit.

In order to reach the LEED target of a 50% reduction for flush fixtures, even higher efficiency toilets would need to be specified. However, toilets beyond the 1.28 gpf rating may not meet the usage and maintenance needs of the University and have not yet been sufficiently tested for use on campus. Therefore, it's likely that design teams would need to implement the use of non-potable water systems in order to earn this credit. Project teams should fully understand the implications of the collection and use of non-potable water before beginning project design.

WATER USE REDUCTION

WE CREDIT 3
1 POINT

HIGH PRIORITY | DIFFICULT FEASIBILITY

LEED CREDIT INTENT

To increase water efficiency within buildings to reduce the burden on municipal water supply and wastewater systems.

LEED CREDIT REQUIREMENTS

Employ strategies that in aggregate use 30, 35 or 40% less water than the water use baseline calculated for the building (not including irrigation).

Calculations are based on occupant usage and must include only the following fixtures and fixture fittings:

- Water Closets
- Urinals
- Lavatory Faucets
- Showers
- Kitchen Sink Faucets
- Pre-rinse Spray Valves



AMHERST WASTEWATER TREATMENT PLANT, 1979

Projects can earn an additional point for achieving a 45% reduction in water use.

UMA CREDIT DISCUSSION

The LEED prerequisite requires 20% reduction in water use. Achieving greater levels of water efficiency will take creativity on the part of the design team, as well as an integrated approach between architects, plumbing engineers, and others on the project team.

The use of waterless urinals may be considered by design teams as an effective strategy for reducing water use. A 2008 study for the Massachusetts EOEAA found that facility managers and custodial staff were overall very satisfied with waterless urinals.¹ This was especially true for new construction; retrofitting with waterless urinals can be difficult due to variations in pipe height and the slope of existing drain lines. The study does not recommend the use of waterless urinals in dormitories, due to potential misuse. In addition to potential water cost savings, waterless urinals do not require water supply pipes which can result in significant savings for the project. That said, the University has yet to implement waterless urinals on this campus, so both cultural change and maintenance training will be necessary.

The use of non-potable (i.e. graywater) systems is highly dependant on project scope and design. Project teams should fully understand the implications of using non-potable water systems for flush fixtures before beginning project design.

¹ Waterless Urinals Report and Evaluation, MA Executive Office of Energy and Environmental Affairs

EA CATEGORY

ENERGY + ATMOSPHERE FINDINGS

- Total electricity:
 - FY09= 122,060,047 kwh
 - Central Heating Plant (CHP) generated: 51%
 - Purchased from Western Massachusetts Electric Company (WMECO): 49%
 - FY10= 123,802,566 kwh
 - CHP generated: 66%
 - Purchased from WMECO: 34%
- 90 campus buildings are currently being metered and data is recorded hourly:
 - 41 academic and administration buildings
 - 42 dormitories
 - 7 auxiliary buildings
- A limited number of campus buildings have been commissioned, and the University is planning to create an in-house commissioning team for the ongoing commissioning of all buildings on campus.
- The CHP has reduced the campus' greenhouse gas emissions by approximately 75%. It generates 100% of the campus' steam and between 60-70% of its electricity.



CENTRAL HEATING PLANT, UMA

This category is considered to be one of the most important for the University. As a state institution, UMA has a responsibility to reduce both operating costs associated with utility use and greenhouse gas emissions. Constructing energy efficient buildings has economic value and is a high priority for the campus.

ENERGY + ATMOSPHERE

The UMA Central Heating Plant replaced a coal-burning facility dating back to 1918. It produces steam and electricity by burning natural gas and oil. As new buildings come on line and utility prices rise, it will be increasingly important to reduce energy use.

In addition, electrical consumption continues to rise due to cultural trends (technology in the classroom, digital media, electronics in student rooms, etc), on-campus population growth, and building expansion. Design teams should investigate all factors – process loads, user habits, HVAC type and configuration, exterior envelope characteristics, etc. – and their potential for increased efficiency.

Three of the Energy and Atmosphere credits – Optimize Energy Performance, Enhanced Commissioning, and Measurement + Verification – have the greatest impact on the energy consumption of new buildings, and can be especially powerful when considered in tandem. Teams are encouraged to design for high performance and enhanced operations using these credits as a starting point.

POSSIBLE POINTS: 35	11 HIGH PRIORITY	9 EASY FEASIBILITY
	12 MEDIUM PRIORITY	15 MODERATE FEASIBILITY
	12 LOW PRIORITY	11 DIFFICULT FEASIBILITY

FUNDAMENTAL COMMISSIONING OF BUILDING ENERGY SYSTEMS

EA PREREQUISITE 1

REQUIRED

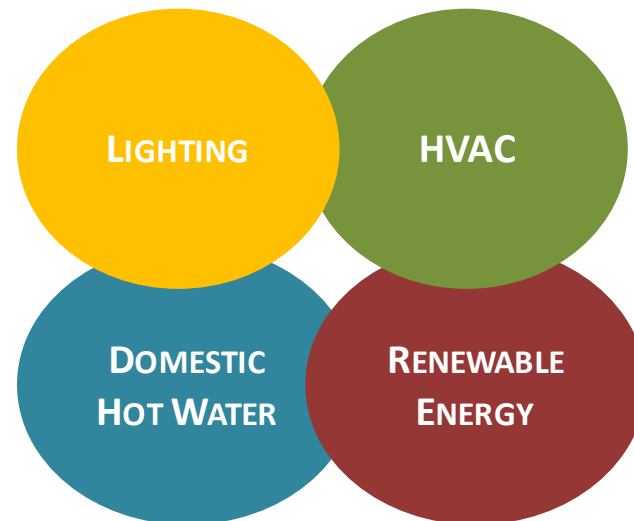
LEED CREDIT INTENT

To verify that the project's energy-related systems are installed, calibrated and perform according to the owner's project requirements, basis of design, and construction documents.

LEED CREDIT REQUIREMENTS

The following commissioning process activities must be completed by the team:

- Designate commissioning authority (CxA)
- Document owner's project requirements (OPR)
- Develop basis of design (BOD)
- Incorporate commissioning requirements into construction documents
- Implement commissioning plan
- Verify installation and performance of the systems to be commissioned
- Complete a summary commissioning report



UMA CREDIT DISCUSSION

Commissioning of energy-related systems is the first step in ensuring that a building performs as designed. Design teams are expected to earn this prerequisite, and should note that Executive Order 484 requires the use of a third party commissioning agent (i.e. not an employee of the design firm.)

MINIMUM ENERGY PERFORMANCE

EA PREREQUISITE 2

REQUIRED

LEED CREDIT INTENT

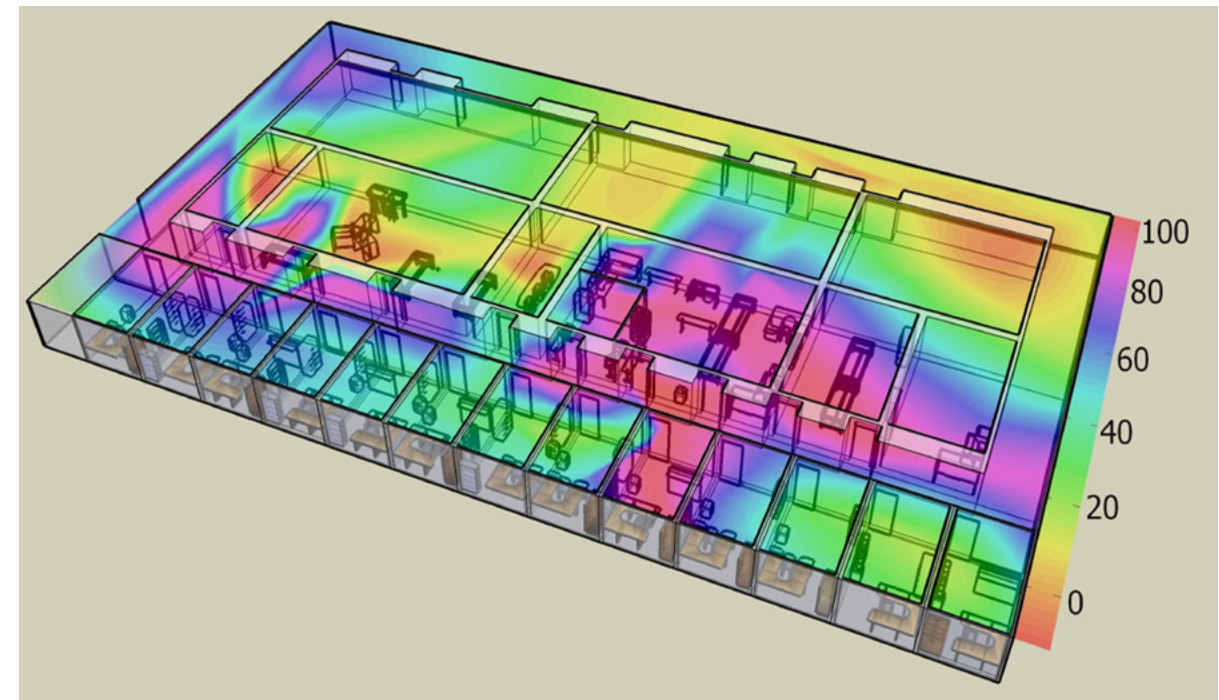
To establish the minimum level of energy efficiency for the proposed building and systems to reduce environmental and economic impacts associated with excessive energy use.

LEED CREDIT REQUIREMENTS

Demonstrate a 10% improvement (for new buildings) or a 5% improvement for major renovations of existing buildings, compared with the baseline building performance rating.

Baseline building performance should be calculated according to ASHRAE standard 90.1 2007.

Create a computer simulation model for the whole building project or follow prescriptive guidelines for energy improvements (depending on building size and type.)



UMA CREDIT DISCUSSION

Design teams are expected to meet the requirements of Executive Order 484, which mandates a 20% improvement in energy usage over MA Energy Code. Since the MA Energy Code is based on ASHRAE 90.1 2007, doing so will also meet the requirements of this LEED prerequisite.

FUNDAMENTAL REFRIGERANT MANAGEMENT

EA PREREQUISITE 3

REQUIRED

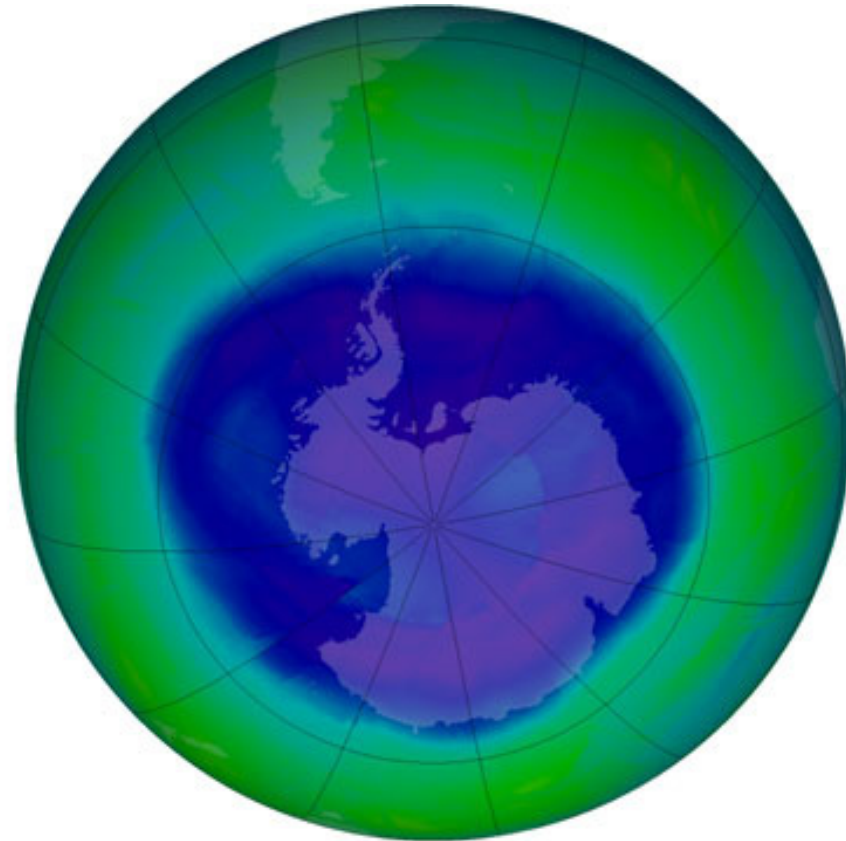
LEED CREDIT INTENT

To reduce stratospheric ozone depletion.

LEED CREDIT REQUIREMENTS

Do not use chlorofluorocarbon (CFC)-based refrigerants in new HVAC&R systems.

Complete a comprehensive CFC phase-out conversion when reusing base building HVAC equipment.



ANTARCTIC OZONE HOLE

UMA CREDIT DISCUSSION

The Montreal Protocol called for a complete phase out of CFC refrigerants by 1995, which makes satisfying this prerequisite standard procedure. The UMA Design Guidelines specify the use of R-134a or R-123 refrigerant, both of which are compliant with this prerequisite.

OPTIMIZE ENERGY PERFORMANCE

EA CREDIT 1

HIGH PRIORITY | MODERATE FEASIBILITY

19 POINTS +1 (EXEMPLARY)

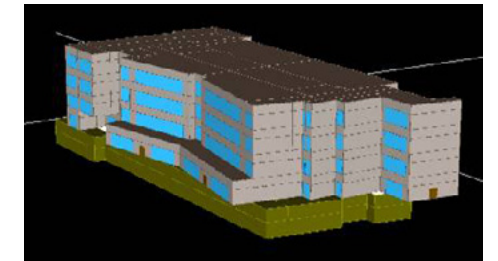
LEED CREDIT INTENT

To achieve increasing levels of energy performance beyond the prerequisite standard to reduce environmental and economic impacts associated with excessive energy use.

LEED CREDIT REQUIREMENTS

Demonstrate a reduction in energy costs using 1 of 3 compliance options:

- Option 1 Whole Building Energy Simulation: ASHRAE 90.1 (1-19 points)
 - 1 point for 12% improvement over the baseline
 - An additional point for every 2% improvement beyond 12%
 - An Exemplary Point can be earned for achieving a 50% improvement over the baseline.
- Option 2 Prescriptive: ASHRAE Advanced Energy Design (1 point)
 - Only for offices, retail or warehouses.
- Option 3 Prescriptive: Advanced Buildings Core Performance (1-3 points)
 - Only for buildings under 100,000 sf, health care and labs are ineligible.



ENERGY MODEL,
NEW LABORATORY SCIENCES BUILDING

UMA CREDIT DISCUSSION

The University favors the Whole Building Simulation (i.e. “energy modeling”) path for a number of reasons. First, energy modeling has the potential for optimizing building design in a way that a prescriptive path may not. Second, as an academic institution, the ability to compare predicted performance to actual performance is valued. Third, more LEED points are available to projects using this path.

Meeting the requirements of Executive Order 484 - a 20% reduction in energy costs - will earn projects 5 points under EAc1. Design teams are encouraged to go beyond the 20% reduction, although specific targets will vary by building type and function. More important than a numerical objective is the process by which project teams integrate the design and energy modeling to ensure that buildings are as energy efficient as possible within the project scope and budget. Designers and energy modelers should maintain a continuous cycle of designing and modeling that begins in the pre-design stage and has iterations through the final construction documents.

All campus projects must consider the future flexibility of building programming. The University recognizes that this requirement may at times impede attainment of the maximum energy cost reduction. However, it will help ensure that buildings have the longest lifecycle possible, one of the fundamental considerations in sustainable building and design.

ON-SITE RENEWABLE ENERGY

EA CREDIT 2
1-7 POINTS +2 (REGIONAL/EXEMPLARY)

HIGH PRIORITY | DIFFICULT FEASIBILITY

LEED CREDIT INTENT

To encourage and recognize increasing levels of on-site renewable energy self-supply to reduce environmental and economic impacts associated with fossil fuel energy use.

LEED CREDIT REQUIREMENTS

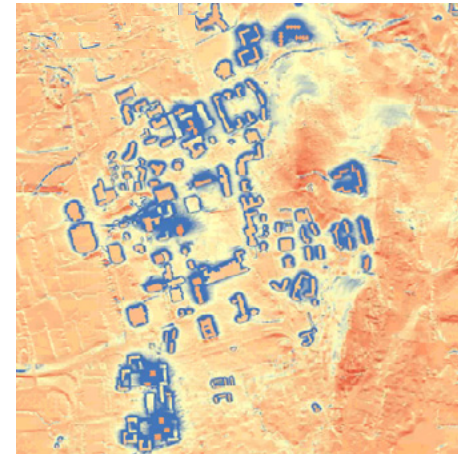
Use on-site renewable energy systems to offset building energy costs.

Use the building annual energy cost calculated in EA Credit 1 or the U.S. Department of Energy's Commercial Buildings Energy Consumption Survey database to determine the estimated electricity use. Points are awarded based on the percent of the annual energy generated by renewable sources.

1	2	3	4	5	6	7	+1 (EXEMPLARY)
1%	3%	5%	7%	9%	11%	13%	15%

Eligible systems include:

- Photovoltaic
- Wind
- Solar thermal
- Bio-fuel electric
- Geothermal heat/electric
- Low-impact hydroelectric
- Wave and tidal



SOLAR RADIATION AT UMA³

UMA CREDIT DISCUSSION

All Commonwealth agencies are required to meet the target of 15% of annual electric usage procured from renewable sources by 2012¹, and the University is aligned with this goal.²

New projects are ideal candidates for renewables, the most viable options being photovoltaics and solar thermal. (There is not enough wind in the region to make wind power practical for the campus.) Design teams should consider integrating pilot projects featuring renewable technologies developed by faculty researchers. Building site and design should be assessed to ensure a best fit for the chosen technology. It is also expected that teams will incorporate strategies - such as daylighting - that reduce the overall energy load so that less (solar) energy generation is required. Consider alternatives to the standard applications of renewable technologies, for example, PV panels that also function as a shading system for windows or landscape. For roof-mounted installations, teams should coordinate closely with the roofing contractor to ensure guarantee of the roof warranty.

Creativity is encouraged when it comes to potential financial structures for the funding of renewable energy generation.

¹ Executive Order 484 ² Climate Action Plan ³ Campus Solar Radiation Study

ENHANCED COMMISSIONING

EA CREDIT 3
2 POINTS + 1 (EXEMPLARY)

HIGH PRIORITY | EASY FEASIBILITY

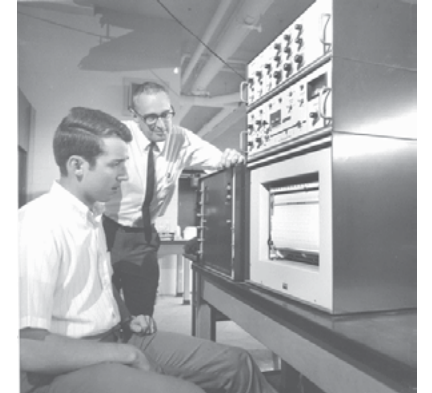
LEED CREDIT INTENT

To begin the commissioning process early in the design process and execute additional activities after system performance verification is completed.

LEED CREDIT REQUIREMENTS

In addition to meeting the requirements of EAp1 Fundamental Commissioning, implement the following process activities:

- Hire Commissioning Agent to begin during schematic design
- Report findings and recommendations directly to the owner
- Review OPR, BOD, and design documents and back-check review comments in subsequent design submission
- Create systems manual for future operating staff
- Verify that operations staff have been trained
- Review operations 8-10 months after project completion and submit plan for resolving outstanding issues



TWO MEN TAKING MEASUREMENTS WITH ENGINEERING EQUIPMENT, CHEMICAL ENGINEERING

An Exemplary Point can be earned by conducting comprehensive envelope commissioning.

UMA CREDIT DISCUSSION

One of the critiques of LEED for New Construction is that many buildings which earn certification are actually no more energy efficient than conventional buildings of the same type.¹ This has to do with many factors, including inappropriate building design, failure of the LEED system to properly weight energy-related credits, and a lack of synergy between building design and construction and ongoing operations and maintenance.

The commissioning of a building's energy systems is a crucial step towards ensuring that the building will perform as designed and provide energy savings as predicted. Under MA law, all new University projects must employ an independent, third party commissioning authority², which, per LEED, may include a qualified employee of the owner. The University holds the position that its own engineers and operations and maintenance staff should fully understand the energy systems of the campus in order to take advantage of potential cost savings. As a result, the training component of the commissioning process is considered to be of utmost importance. Design teams should work closely with the campus to appoint a commissioning authority for each project who is especially skilled at training and able to work in conjunction with one or more UMA employees during the commissioning process.

¹ USGBC ² Executive Order 484

ENHANCED REFRIGERANT MANAGEMENT

EA CREDIT 4
2 POINTS

MEDIUM PRIORITY | MODERATE FEASIBILITY

LEED CREDIT INTENT

To reduce ozone depletion and support early compliance with the Montreal Protocol while minimizing direct contributions to climate change.

LEED CREDIT REQUIREMENTS

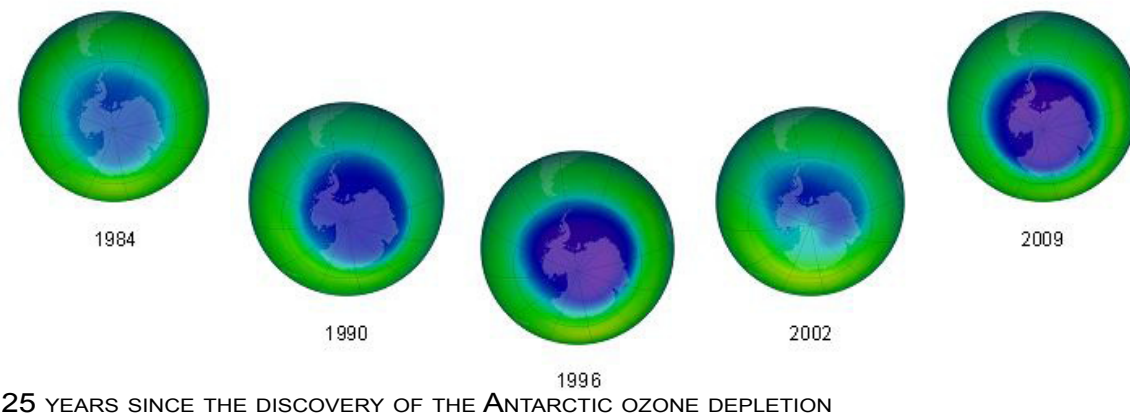
Do not use refrigerants.

Or

Select refrigerants and heating, ventilating, air conditioning and refrigeration that minimize or eliminate the emission of compounds that contribute to ozone depletion and global warming.

$$\text{LIFE CYCLE GLOBAL WARMING POTENTIAL (LCGWP)} + \text{LIFE CYCLE OZONE DEPLETION POTENTIAL (LCODP)} \times 105 \leq 100$$

LCGWP & LCODP are determined by factoring the Ozone Depletion Potential and Global Warming Potential (constants for each refrigerant) with Leakage Rate, End-of-life Refrigerant Loss, Refrigerant Charge, and Equipment Life (specific to system)



UMA CREDIT DISCUSSION

Refrigerant choice is determined by a combination of factors. These include cost (both initial and operating), efficiency, anticipated phase-out, delivery schedule, and LEED credit compliance. The priority of each of these factors varies from project to project.

Currently, UMA specifies the common refrigerants, HCFC-123 and HFC-134a. While these refrigerants have very low Ozone Depletion Potentials and moderate Global Warming Potentials, project specific calculations will be necessary to determine credit compliance. Design teams should consider the use of refrigerants with even lower Ozone Depletion Potential and Global Warming Potential while performing a life cycle cost analysis for each option.

MEASUREMENT AND VERIFICATION

EA CREDIT 5
3 POINTS

HIGH PRIORITY | MODERATE FEASIBILITY

LEED CREDIT INTENT

To provide for the ongoing accountability of building energy consumption over time.

LEED CREDIT REQUIREMENTS

Develop and implement a measurement and verification plan that covers at least 1 year of occupancy.

Plan must include a process for corrective action.

M+V Plan must be consistent with either Option D or Option B of the IPMVP.

- Option B: ECM Isolation Small/simple building
 - Isolate main components + compare to individual baselines
 - HVAC, Hot water, Steam
- Option D: Whole Building Calibrated Simulation
 - Large/complicated buildings
 - Use whole building analysis + monitoring
 - Calibrate energy simulation model to as-built energy use



UMA CREDIT DISCUSSION

M+V is very important at UMA. Design teams should work closely with the University to ensure that each project's M+V plan will support ongoing efforts to track and understand energy data, as well as enhance operations and maintenance. For most projects, Option D is recommended. Design teams should provide a baseline energy model (ASHRAE 90.1) as well as an as-built energy model. The University's M+V team will calibrate the as-built energy model to reflect actual weather conditions, occupancy patterns, and updated load data.

Design teams should determine meter location with help from the M+V team. Specific meter locations will vary by project, but should include, at a minimum, individual electrical panels, large mechanical equipment (chillers, etc.), and variable frequency drives (VFDs). Domestic hot water, building water, steam for heat, and steam for hot water should be metered as well. When possible, motion sensors and swipe card access doors should be metered to measure occupancy. In order to establish campus-wide energy use benchmarks, design teams are encouraged to sub-meter the building using zones defined by program function. All metered data should feed into Metasys, the campus-wide Building Automation System (BAS).

GREEN POWER

EA CREDIT 6
2 POINT + 1 (EXEMPLARY)

LOW PRIORITY | EASY FEASIBILITY

LEED CREDIT INTENT

To encourage the development and use of grid-source, renewable energy technologies on a net zero pollution basis.

LEED CREDIT REQUIREMENTS

Provide at least 35% of the building's electricity from renewable sources based on quantity of energy consumed, not cost.

Project teams may choose to purchase Renewable Energy Credits that cover 70% of the energy consumed for one year.

An extra point can be earned if projects purchase 100% of their electricity from renewable sources.



UMA CREDIT DISCUSSION

UMA's electricity provider, Western Massachusetts Electric Company, does not provide Green Power, so earning this credit must be done through the purchase of Renewable Energy Credits (RECs). Though UMA is committed to carbon emissions reduction, the purchase of RECs is not a priority at this time. Though relatively simple, this credit requires additional costs without providing direct tangible benefits to the program of the building and therefore is not encouraged.

As a strategy for funding carbon reduction projects in an increasingly constricted budget environment, UMA's ongoing approach is to generate revenue through the sale of RECs from on-campus renewable energy. The Central Heating Plant earns RECs due to its co-generation abilities and last year, UMA generated over \$1 million from the sales of these RECs. These funds will be set aside and dedicated to future energy conservation and carbon reduction projects on campus.¹

¹ Climate Action Plan



MR CATEGORY

FINDINGS

- The University's physical character has evolved over almost 150 years and the material palette reflects this fact.
- Exterior building materials include brick, concrete, stone, steel, slate and glass.
- 2/3 of the campus was constructed during the building boom of the 1960s and 1970s.
- Buildings on campus are expected to last for 50 years or more.



The selection of materials for campus buildings is influenced by many different stakeholders. In addition to environmental considerations, user safety and health, durability and maintenance, and cost are all factors. Overall, material selection will be project dependant, but teams are expected to balance the disparate needs of the University when selecting building materials.

Although the environmental impact of materials is a chief consideration, the campus has had experiences with poor material choices which illustrate the importance of using market-tested materials over the next "green" thing.

MATERIALS + RESOURCES

In addition, the University has spent millions of dollars over the years for abatement of various toxic materials from building sites, including asbestos and pcbs. Design teams are expected to consider the lifetime health risks and benefits of all materials used on new campus projects.

The University has a comprehensive recycling program, where materials are taken to the campus Waste Management Transfer Station and sorted and shipped to a large plant in the region. Design teams should incorporate means for recycling in all buildings, and consider using building design to educate and involve users in recycling efforts.

POSSIBLE POINTS: 14

3 HIGH PRIORITY

7 MEDIUM PRIORITY

4 LOW PRIORITY

2 EASY FEASIBILITY

8 MODERATE FEASIBILITY

4 DIFFICULT FEASIBILITY

STORAGE AND COLLECTION OF RECYCLABLES

MR PREREQUISITE 1

REQUIRED

LEED CREDIT INTENT

To facilitate the reduction of waste generated by building occupants that is hauled to and disposed of in landfills.

LEED CREDIT REQUIREMENTS

Provide an easily-accessible dedicated area for the collection and storage of materials for recycling for the entire building.

Materials must include at a minimum:

- paper
- corrugated cardboard
- glass
- plastics
- metals



RECYCLING ROOM, NORTH D, NORTH RESIDENTIAL AREA

UMA CREDIT DISCUSSION

Recycling on campus is a high priority. The Office of Waste Management has created a comprehensive recycling program which has helped the University's overall recycling rate reach 65%. Students, faculty and staff are encouraged to sort recyclable materials into the ubiquitous color-coded bins. These recycling efforts conserve 45,000 gallons of oil and 20,000 trees and help UMA avoid \$275,000 annually in disposal charges.¹

All projects should contain areas for the collection and storage of materials to be recycled.² Design teams should also coordinate with the campus to determine whether the building needs an outdoor trash/recycling corral in addition to the interior area.

¹ Office of Waste Management ² UMA Design Guidelines

BUILDING REUSE - MAINTAIN EXISTING WALLS, FLOORS + ROOF

MR CREDIT 1.1

MEDIUM PRIORITY | MODERATE FEASIBILITY

1-3 POINTS (+1 REGIONAL)

LEED CREDIT INTENT

To extend the life cycle of existing building stock, conserve resources, retain cultural resources, reduce waste and reduce environmental impacts of new buildings as they relate to materials manufacturing and transport.

LEED CREDIT REQUIREMENTS

Maintain the existing building structure:

- structural walls
- structural floor
- roof decking

And envelope:

- exterior skin and framing
- excluding window assemblies & non-structural roofing material

The minimum percentage building reuse for each point is:

- 55% 1 point
- 75% 2 points
- 95% 3 points

If the project includes an addition with square footage more than 2 times the square footage of the existing building, this credit is not applicable.

UMA CREDIT DISCUSSION

This credit is a high priority for legacy structures, or buildings considered to have historical significance for the University.

The feasibility of this credit will vary greatly by project. For major renovations of existing building, the requirements may be easily achievable.

¹ Climate Action Plan



95% OF STRUCTURE AND ENVELOPE RESUSED¹
SKINNER HALL, UMA SCHOOL OF NURSING

BUILDING REUSE - MAINTAIN 50% OF INTERIOR NON-STRUCTURAL ELEMENTS

MR CREDIT 1.2
1 POINT

LOW PRIORITY | DIFFICULT FEASIBILITY

LEED CREDIT INTENT

To extend the life cycle of existing building stock, conserve resources, retain cultural resources, reduce waste and reduce environmental impacts of new buildings as they relate to materials manufacturing and transport.

LEED CREDIT REQUIREMENTS

Use existing interior non-structural elements in at least 50% of the completed building, including additions.

- interior walls
- doors
- floor coverings
- ceiling systems

If the project includes an addition with square footage more than 2 times the square footage of the existing building, this credit is not applicable.



FAILING WOOD CURTAIN WALL,
BARTLETT HALL

UMA CREDIT DISCUSSION

For the most part, major renovations are an opportunity to replace the existing materials with newer, more durable materials. As part of UMA's commitment to sustainability, major renovations are only scheduled for buildings that are unable to support programmatic needs and/or pass building code. The existing non-structural elements in such buildings are rarely reusable. In a case where the existing materials are reusable, it is unlikely that the University would completely discontinue occupancy. Per LEED, such a project would not be considered a major renovation, nor eligible for certification under the New Construction and Major Renovation rating system.

In situations where existing walls are maintained after a major renovation, they tend to be structural walls and therefore not applicable to this credit.

CONSTRUCTION WASTE MANAGEMENT

MR CREDIT 2
1-2 POINTS (+1 EXEMPLARY)

HIGH PRIORITY | MODERATE FEASIBILITY

LEED CREDIT INTENT

To divert construction and demolition debris from disposal in landfills and incineration facilities. Redirect recyclable recovered resources back to the manufacturing process and reusable materials to appropriate sites.

LEED CREDIT REQUIREMENTS

Recycle and/or salvage nonhazardous construction and demolition debris. Develop and implement a construction waste management plan that, at a minimum, identifies the materials to be diverted from disposal and whether the materials will be sorted on-site or co-mingled.

Calculations can be done by weight or volume, but must be consistent throughout.

- 50% 1 point
- 75% 2 points
- 95% +1 Exemplary Point



OFFICE OF WASTE MANAGEMENT, TILLSON FARM

UMA CREDIT DISCUSSION

Recycling is a high priority on campus. However, waste produced by construction activities is not sorted on campus, rather, it is the responsibility of the contractor to properly dispose of construction and demo waste.

It is the University's position that, due to the location of the campus and the availability of local waste contractors who can recycle and track construction waste, a minimum target of 75% should be met by all project teams.

MATERIALS REUSE

MR CREDIT 3
1-2 POINTS (+1 EXEMPLARY)

LOW PRIORITY | DIFFICULT FEASIBILITY

LEED CREDIT INTENT

To reuse building materials and products to reduce demand for virgin materials and reduce waste, thereby lessening impacts associated with the extraction and processing of virgin resources.

LEED CREDIT REQUIREMENTS

Use salvaged, refurbished or reused materials, the sum of which constitutes at least 5% or 10% based on cost of the total value of materials on the project.

- 5% 1 point
- 10% 2 points

Projects can earn an additional point for using salvaged, refurbished or reused materials the sum of which constitutes 15% of total materials value.



RE-PURPOSED GRANITE USED FOR THE SOUTHWEST CONCOURSE RENOVATION

UMA CREDIT DISCUSSION

The University has standardized building materials in order to simplify alterations, maintenance, and repair.¹ Although re-purposing salvaged materials can save on cost of new materials and has significant environmental benefits including reducing landfill space and the effects of harvesting and manufacturing, UMA identifies this credit as a low priority.

On some small scale projects, it may be possible to reuse building materials. Design teams should track reuse and apply for the LEED credit if the requirements are met.

¹ UMA Design Guidelines

RECYCLED CONTENT

MR CREDIT 4
1-2 POINTS (+1 EXEMPLARY)

MEDIUM PRIORITY | MODERATE FEASIBILITY

LEED CREDIT INTENT

To increase demand for building products that incorporate recycled content materials, thereby reducing the impacts resulting from extraction and processing of virgin materials.

LEED CREDIT REQUIREMENTS

Use materials with a total recycled content that constitutes at least 10% or 20%, based on cost, of the total value of the materials in the project.

- 10% 1 point
- 20% 2 points

Include only materials permanently installed in the project. Mechanical, electrical and plumbing components, and specialty items such as elevators cannot be included in this calculation.

Projects can earn an additional point by using recycled materials which total 30% of the materials budget.



STUDIO ARTS BUILDING WITH REUSED PAVERS AND RECYCLED FLY ASH

UMA CREDIT DISCUSSION

For most building projects, there are many ways to incorporate the use of recycled materials into the design. Often, standard building materials contain recycled materials. Structural steel beams and columns produced in the US, for example, have an average recycled content rate of 93%.¹ Since this LEED credit is based on the overall project materials budget, design teams should assess the potential for recycled content of “big ticket items” early on. In many cases, projects may earn this credit simply by tracking recycled materials, so it is important to require the submittal of recycled materials in the specifications.

While creativity in design is encouraged, building materials should be chosen for their function and durability above all else.

¹ American Institute of Steel Construction

REGIONAL MATERIALS

MR CREDIT 5
1-2 POINTS (+1 EXEMPLARY)

MEDIUM PRIORITY | EASY FEASIBILITY

LEED CREDIT INTENT

To increase demand for building materials and products that are extracted and manufactured within the region, thereby supporting the use of indigenous resources and reducing the environmental impacts resulting from transportation.

LEED CREDIT REQUIREMENTS

Use building materials that have been extracted, harvested or recovered, as well as manufactured, within 500 miles of the project site.

- 10% 1 Point
- 20% 2 Points

Percent is calculated using material costs. Assemblies using multiple materials can be calculated separately.

Projects can earn an additional point by using regional materials which total 30% of the materials budget.



500 MILE RADIUS FROM UMA CAMPUS

UMA CREDIT DISCUSSION

Although achievement of this credit will be dependent on what type of materials are used on the project, it should be a goal for most design teams. Wood, concrete, stone, and brick are all readily available within the region. Sourcing metals that are extracted within the radius may be more difficult, but many steel manufacturers provide detailed information about how their products comply with this credit.

Design teams should assess their materials budget early on to determine the “big ticket” items (concrete, steel, wood, brick, landscape materials, carpet), in order to facilitate earning this credit. In some cases, projects may earn this credit simply by tracking regional materials, so it is important to require the submittal of regional materials in the specifications.

RAPIDLY RENEWABLE MATERIALS

MR CREDIT 6
1 POINT (+1 EXEMPLARY)

LOW PRIORITY | DIFFICULT FEASIBILITY

LEED CREDIT INTENT

To reduce the use and depletion of finite raw materials and long-cycle renewable materials by replacing them with rapidly renewable materials.

LEED CREDIT REQUIREMENTS

Use rapidly renewable building materials and products for 2.5% of the total value of all building materials and products used on the project, based on cost.

Rapidly renewable materials and products are made from plants that are typically harvested within a 10-year or shorter cycle.

Projects can earn an Exemplary point by achieving a rapidly renewable materials content of 5% or more.



BAMBOO LABORATORY FURNISHINGS,
INTEGRATED SCIENCE BUILDING

UMA CREDIT DISCUSSION

At UMA, the most important characteristic of any building material is durability. All of the University's buildings see a high occupant usage, and we expect buildings to function for 50 years or more.¹ Therefore, it is crucial that design teams understand the correct use and installation of all materials that they include in a project.

The feasibility of this credit is highly dependant on the project, since materials will differ depending on the function and look of a building. Highly visible materials such as bamboo or cork may be appropriate, but project teams should also investigate product assemblies which may also have rapidly renewable content. For example, door cores (agrifiber), millwork (bamboo or agrifiber), monolithic resinous flooring (castor oil) and spray foam insulation (soy or castor oil) are all products that contain rapidly renewable content. Again, project teams should ascertain the durability and functionality of all materials before specifying their use.

¹ UMA Design Guidelines

CERTIFIED WOOD

MR CREDIT 7
1 POINT (+1 EXEMPLARY)

High PRIORITY | MODERATE FEASIBILITY

LEED CREDIT INTENT

To encourage environmentally responsible forest management.

LEED CREDIT REQUIREMENTS

Use a minimum of 50% of wood-based materials that are certified in accordance with the Forest Stewardship Council's principles and criteria.

- structural framing
- dimensional framing
- flooring
- sub-flooring
- wood doors
- finishes



FOREST STEWARDSHIP COUNCIL CERTIFIED WOOD

Wood purchased for temporary use (construction) on the project may be included at the discretion of the team.

An additional point can be earned if 95% or more of the project's new wood is FSC certified.



The Massachusetts Woodland Cooperative (MWC) was founded with help from members of the Department of Environmental Conservation. MWC promotes sustainable, local forestry and has earned Forest Stewardship Council (FSC) land management certification.

UMA CREDIT DISCUSSION

UMA is committed to sustainable forestry and building practices should reflect that commitment. The use of FSC certified wood throughout projects is a high priority. Research in the Building Construction Technology department is closely linked with local sustainable forestry efforts. This credit does not establish a minimum quantity of wood, and most UMA projects use very little wood. Therefore, the use of 50% FSC certified wood should be specified early in the design process.

IEQ CATEGORY

FINDINGS

- Approximately 85% of the buildings on campus have operable windows to allow for natural ventilation.
- Smoking is prohibited on campus within 25 feet of all building entrances.
- Low VOC paints, sealants and coatings have been part of the University's design guidelines since 2004.



UMA places a high priority on the quality of indoor environments. Ventilation, lighting, temperature, and humidity all affect the overall comfort of building occupants. Although it is difficult to quantify, the performance of students, researchers, and staff depends in part on their level of comfort.

INDOOR ENVIRONMENTAL QUALITY

However, and especially in this climate, indoor environmental quality often comes at the expense of energy efficiency, with air exchanges being the primary measurement of air quality. Design teams are encouraged to explore alternate means of achieving good indoor air quality, including passive solutions, innovative heat exchange, and careful attention to the quality of materials used inside the building envelope.

POSSIBLE POINTS: 15	10 HIGH PRIORITY	6 EASY FEASIBILITY
	3 MEDIUM PRIORITY	9 MODERATE FEASIBILITY
	2 LOW PRIORITY	0 DIFFICULT FEASIBILITY

MINIMUM AIR QUALITY PERFORMANCE

IEQ PREREQUISITE 1

REQUIRED

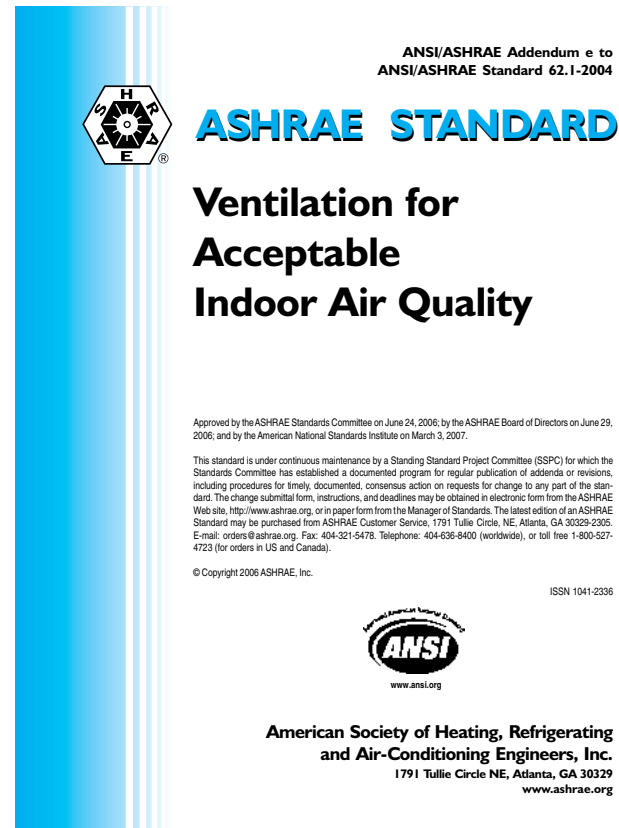
LEED CREDIT INTENT

To establish minimum indoor air quality (IAQ) performance.

LEED CREDIT REQUIREMENTS

Meet the minimum requirements of Sections 4 through 7 of ASHRAE Standard 62.1-2007, Ventilation for Acceptable Indoor Air Quality.

Mechanical ventilation systems must be designed using the ventilation rate procedure or the applicable local code, whichever is more stringent.



UMA CREDIT DISCUSSION

Current MA building code is based on the International Building Code 2009, which has minimum ventilation rates identical to ASHRAE 62.1. Therefore, teams will meet the requirements of this prerequisite by meeting state code.

ENVIRONMENTAL TOBACCO SMOKE (ETS) CONTROL

IEQ PREREQUISITE 2

REQUIRED

LEED CREDIT INTENT

To prevent exposure of building occupants and indoor surfaces to environmental tobacco smoke (ETS).

LEED CREDIT REQUIREMENTS

Prohibit smoking in the building.

Prohibit on-property smoking within 25 feet of entries, outdoor air intakes, and operable windows.

Provide signage to allow smoking in designated areas.



UMA CREDIT DISCUSSION

Smoking has been prohibited in all buildings on campus (with the exception of a few designated smoking areas) since 1993. A recent amendment of the Smoking Policy prohibits smoking on properties within 25 feet of the building entrances, which is in compliance with this prerequisite. In addition, the Faculty Senate Health Council is currently working on a recommendation for a smoke free campus.

All new buildings should be smoke-free and provide signage enforcing the 25 foot boundary.

OUTDOOR AIR DELIVERY MONITORING

IEQ CREDIT 1
1 POINT

HIGH PRIORITY | EASY FEASIBILITY

LEED CREDIT INTENT

To provide capacity for ventilation system monitoring.

LEED CREDIT REQUIREMENTS

Install permanent monitoring systems to ensure that ventilation systems maintain design minimum requirements.

Configure all monitoring equipment to generate an alarm when the airflow values or carbon dioxide (CO₂) levels vary by 10% or more from the design value.

- Monitor CO₂ concentrations within densely occupied spaces.
- Provide a direct outdoor airflow measurement device capable of measuring the minimum outdoor air intake flow



UMA CREDIT DISCUSSION

At UMA, good ventilation is important for a number of reasons, including the maintenance of an optimal learning environment. New projects are expected to monitor both outdoor airflow and CO₂ concentrations using the campus Building Automation System (BAS).

Teams should explore options which can optimize both indoor air quality and energy savings, such as demand-controlled ventilation systems and economizers.

INCREASED VENTILATION

IEQ CREDIT 2
1 POINT

LOW PRIORITY | MODERATE FEASIBILITY

LEED CREDIT INTENT

To provide additional outdoor air ventilation to improve indoor air quality and promote occupant comfort, well-being and productivity.

LEED CREDIT REQUIREMENTS

Increase breathing zone outdoor air ventilation rates to all occupied spaces by at least 30% above the minimum rates required by ASHRAE Standard 62.1-2007 as determined by IEQ p1.

The image shows the cover of the ASHRAE Standard 62.1-2007, 'Ventilation for Acceptable Indoor Air Quality'. The cover is blue and white with the ASHRAE logo at the top. A large, yellow, 3D-style '+30%' graphic is overlaid on the cover. The text on the cover includes 'ANSI/ASHRAE Addendum e to ANSI/ASHRAE Standard 62.1-2004', 'ASHRAE STANDARD', 'Ventilation for Acceptable Indoor Air Quality', and the ASHRAE logo. At the bottom, it says 'American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. 1791 Tullie Circle NE, Atlanta, GA 30329 www.ashrae.org'. There is also a small ANSI logo and 'ISSN 1041-2336'.

UMA CREDIT DISCUSSION

It is the University's position that the minimum ventilation rates of ASHRAE 62.1 (as mandated by the MA Building Code) are sufficient and will fully support a program of excellent indoor air quality. Design teams are not encouraged to exceed those rates, as the increase in energy costs will outweigh potential benefits.

CONSTRUCTION INDOOR AIR QUALITY MANAGEMENT PLAN: DURING CONSTRUCTION

IEQ CREDIT 3.1
1 POINT

HIGH PRIORITY | MODERATE FEASIBILITY

LEED CREDIT INTENT

To reduce indoor air quality problems resulting from construction or renovation.

LEED CREDIT REQUIREMENTS

Develop and implement an IAQ management plan for the construction and preoccupancy phases of the building:

- During construction, meet or exceed the recommended control measures of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA).
- HVAC Protection, Pathway Interruption, Source Control, Housekeeping, Scheduling
- Protect stored on-site and installed absorptive materials from moisture damage.
- If permanently installed air handlers are used during construction, filtration media with a minimum efficiency reporting value of 8 must be used at each return air grille.



UMA CREDIT DISCUSSION

UMA is dedicated to employee health and safety, including that of its subcontracted construction workers. In addition, the University is committed to good indoor air quality throughout the life of its buildings, and construction activities can play a large part in achieving this goal.

Earning this credit should not add cost to the project if air handling units are not in use during construction. In situations where air handling units are used, the cost of filters and replacement filters will increase the project cost.

UMA expects contractors to maintain a clean, safe work site. Design teams must coordinate with construction staff and subcontractors to ensure that everyone complies with requirements, and to ensure the proper documentation of IAQ measures.

CONSTRUCTION INDOOR AIR QUALITY MANAGEMENT PLAN: BEFORE OCCUPANCY

IEQ CREDIT 3.2
1 POINT

HIGH PRIORITY | MODERATE FEASIBILITY

LEED CREDIT INTENT

To reduce indoor air quality problems resulting from construction or renovation.

LEED CREDIT REQUIREMENTS

Develop and implement an IAQ management plan and implement it after all finishes have been installed and the building has been completely cleaned before occupancy.

- Option 1: Flush-Out
 - 14,000 f3 outdoor air per f2 with an internal temp of 60°F, 60% humidity.
- Option 2: Air Testing
 - After construction end and prior to occupancy, conduct baseline IAQ testing.
 - Conduct an additional flush-out where maximum concentration limits are exceeded and retest the area.



UMA CREDIT DISCUSSION

UMA is committed to maintaining healthy, non-toxic, indoor environments for students, faculty and staff. This credit, combined with IEQc3.1, helps verify that a new building is beginning its lifecycle with good indoor air quality.

Attaining this credit using the flush-out option may be difficult due to the tight construction and occupancy schedules of most campus projects.

More important than credit attainment is the adherence of construction teams to a written IAQ plan. Design teams should begin considering indoor air quality in the schematic design phase and incorporate the use of low-VOC paints and sealants, non-toxic materials and architectural finishes, and good work site practices throughout.

LOW-EMITTING MATERIALS – ADHESIVES AND SEALANTS

IEQ CREDIT 4.1
1 POINT

HIGH PRIORITY | MODERATE FEASIBILITY

LEED CREDIT INTENT

To reduce the quantity of indoor air contaminants that are odorous, irritating, and/or harmful to the comfort and well-being of installers and occupants.

LEED CREDIT REQUIREMENTS

Adhesives, Sealants and Sealant Primers must comply with South Coast Air Quality Management District (SCAQMD) Rule #1168.

Aerosol Adhesives must comply with Green Seal Standard for Commercial Adhesives GS – 36.

VOC Budget Methodology: If no appropriate LEED compliant product exists, teams may show overall VOC compliance using a VOC budget method:



LOW VOC CAULKING, SKINNER HALL

$(\text{VOLUME COMPLIANT PRODUCTS} * \text{LEED VOC LIMITS}) - (\text{VOLUME COMPLIANT PRODUCTS} * \text{ACTUAL VOC LEVELS}) = \text{AVAILABLE VOC BUDGET}$

UMA CREDIT DISCUSSION

Volatile Organic Compounds react with sunlight to form ground-level ozone that can have significant detrimental effects on human health. VOCs are common in many building materials, but alternatives with low VOCs are widely available at little or no additional cost.

Functionality should be considered above all else. Design teams are expected to achieve this credit when market-tested products are available. Teams should consider using the VOC budget method to show compliance in the event that one or more products do not meet University standards for durability.

LOW-EMITTING MATERIALS – PAINTS AND COATINGS

IEQ CREDIT 4.2
1 POINT

HIGH PRIORITY | MODERATE FEASIBILITY

LEED CREDIT INTENT

To reduce the quantity of indoor air contaminants that are odorous, irritating, and/or harmful to the comfort and well-being of installers and occupants.

LEED CREDIT REQUIREMENTS

Architectural paints and coatings applied to interior walls and ceilings must not exceed the VOC content limits established in Green Seal Standard GS-11.

Anti-corrosive and anti-rust paints applied to interior ferrous metal substrates must not exceed the VOC content limit of 250 g/L

Clear wood finishes, floor coatings, stains, primers, and shellacs applied to interior elements must not exceed the VOC content limits established in South Coast Air Quality Management District (SCAQMD).



HIGH VOC PAINT

UMA CREDIT DISCUSSION

Volatile Organic Compounds react with sunlight to form ground-level ozone that can have significant detrimental effects on human health. VOCs are common in many building materials, but alternatives with low VOCs are widely available at little or no additional cost.

Design teams are expected to specify the use of low VOC paints and coatings that are LEED compliant. Paint products should be low odor, low or zero VOC coating with anti-microbial properties¹. Project teams should coordinate with contractors to collect documentation for LEED submittals.

¹UMA Design Guidelines

LOW-EMITTING MATERIALS – FLOORING SYSTEMS

IEQ CREDIT 4.3

HIGH PRIORITY | MODERATE FEASIBILITY

1 POINT

LEED CREDIT INTENT

To reduce the quantity of indoor air contaminants that are odorous, irritating, and/or harmful to the comfort and well-being of installers and occupants.

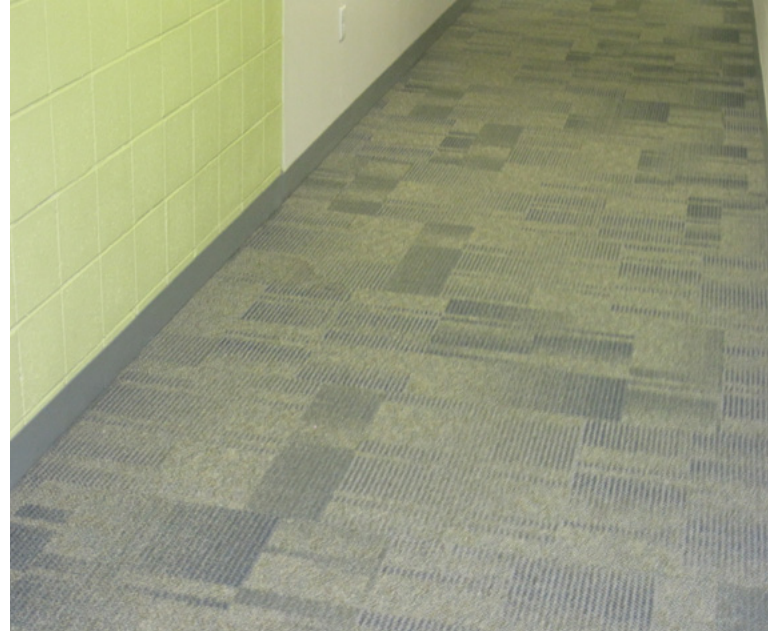
LEED CREDIT REQUIREMENTS

All carpet and carpet cushion installed in the building interior must meet the testing and product requirements of the Carpet and Rug Institute Green Label Plus program.

All hard surface flooring must be certified as compliant with the FloorScore standard by an independent third party.

Concrete, wood, bamboo and cork floor finishes such as sealer, stain and finish must meet the requirements of South Coast Air Quality Management District (SCAQMD) Rule 1113.

Tile setting adhesives and grout must meet SCAQMD Rule 1168.



LOW VOC CARPET, NORTH RESIDENTIAL HALL

UMA CREDIT DISCUSSION

Volatile Organic Compounds react with sunlight to form ground-level ozone that can have significant detrimental effects on human health. VOCs are common in many building materials, but alternatives with low VOCs are widely available at little or no additional cost.

According to the UMA Design Guidelines, “carpet shall have low indoor air pollution emissions, low overall VOC emissions, and low concentrations of toxic and irritating components.” Design teams are expected to specify the installation of low VOC flooring systems that are LEED compliant, however, durability and maintenance are the primary factors when selecting flooring systems. Materials should be chosen which have been proven effective for similar applications.

LOW-EMITTING MATERIALS – COMPOSITE WOOD AND AGRIFIBER PRODUCTS

IEQ CREDIT 4.4

HIGH PRIORITY | MODERATE FEASIBILITY

1 POINT

LEED CREDIT INTENT

To reduce the quantity of indoor air contaminants that are odorous, irritating, and/or harmful to the comfort and well-being of installers and occupants.

LEED CREDIT REQUIREMENTS

Composite wood and agrifiber products used on the interior of the building must contain no added urea-formaldehyde resins.

Composite wood and agrifiber products include:

- Particleboard
- Medium Density Fiberboard
- Plywood
- Wheatboard
- Strawboard
- Panel Substrates
- Door Cores



LOW VOC PLYWOOD

UMA CREDIT DISCUSSION

Formaldehyde is a naturally occurring VOC found in small amounts in animals and plants, but is carcinogenic and an irritant to most people when present in high concentrations.

Design teams are expected to specify the installation of wood and agrifiber products without urea-formaldehyde, and coordinate with contractors to collect documentation for LEED submittals.

INDOOR CHEMICAL AND POLLUTANT SOURCE CONTROL

IEQ CREDIT 5
1 POINT

HIGH PRIORITY | EASY FEASIBILITY

LEED CREDIT INTENT

To minimize building occupant exposure to potentially hazardous particulates and chemical pollutants.

LEED CREDIT REQUIREMENTS

Employ permanent entryway systems at least 10 feet long in the primary direction of travel to capture dirt and particulates entering the building.

Acceptable entryway systems include grates, grills, and slotted systems. Roll-out mats are acceptable only when maintained on a weekly basis by a contracted service organization.

Sufficiently exhaust each space where hazardous gases or chemicals may be present or used:

- Garages
- Laboratories
- Prep rooms
- Art rooms
- Shops
- Copying and printing rooms

Install new air filtration media in regularly occupied areas prior to occupancy.



ENTRY GRATE, SKINNER HALL

UMA CREDIT DISCUSSION

At UMA, it is important that buildings support their janitorial staff in maintaining a clean and non-toxic environment. Because of the frequency with which students and faculty move through our buildings, and the prevalence of snow, sand, salt, dirt, and water, entryway systems are especially important for UMA projects.

Design teams are encouraged to incorporate the requirements of this credit early in the design process. Depending on the building type, some or all of the requirements will be applicable. Design teams should work closely to coordinate HVAC and room layout to ensure superior air quality.

CONTROLLABILITY OF SYSTEMS – LIGHTING

IEQ CREDIT 6.1
1 POINT

MEDIUM PRIORITY | MODERATE FEASIBILITY

LEED CREDIT INTENT

To provide a high level of lighting system control by individual occupants or groups in multi-occupant spaces and promote their productivity, comfort and well-being.

LEED CREDIT REQUIREMENTS

Provide individual lighting controls for 90% of the building occupants.

Provide lighting system controls for all shared multi-occupant spaces to enable adjustments that meet group needs and preferences.



MULTI-SCENE CONTROL

UMA CREDIT DISCUSSION

Most buildings on campus are used by a variety of users and groups for a variety of functions. Lighting that is flexible and can respond to the different needs of occupants is important for creating the ideal learning environment.

Achieving this credit is project dependant, but when sought, individual and group lighting controls should be paired with occupancy sensors to ensure optimal energy use. Project teams are also encouraged to incorporate dimmers and daylighting controls into the lighting design, and to work closely with the University in specifying control systems that have proven long-term viability and are easily maintained.

CONTROLLABILITY OF SYSTEMS - THERMAL COMFORT

IEQ CREDIT 6.2

MEDIUM PRIORITY | MODERATE FEASIBILITY

1 POINT

LEED CREDIT INTENT

To provide a high level of thermal system control by individual occupants or groups in multi-occupant spaces and promote their productivity, comfort and well-being.

LEED CREDIT REQUIREMENTS

Provide individual comfort controls for 50% of the building occupants.

Operable windows may be used in lieu of controls for occupants located 20 feet inside and 10 feet to either side of the operable part of a window.

Provide comfort system controls for all shared multi-occupant spaces to enable adjustments that meet group needs and preferences.



OPERABLE WINDOW INDICATOR,
NORTH RESIDENTIAL DORM

UMA CREDIT DISCUSSION

The feasibility of this credit depends on the building type and design. Dormitories, individual offices, and meeting rooms are all excellent candidates for individual thermal comfort controls. Operable windows are appropriate for most campus buildings and can help meet the requirements of this credit.

User cooperation is necessary for continued successful operation. Design teams are encouraged to work closely with the University in specifying control systems that have proven long-term viability and are easily maintained.

THERMAL COMFORT - DESIGN

IEQ CREDIT 7.1

HIGH PRIORITY | EASY FEASIBILITY

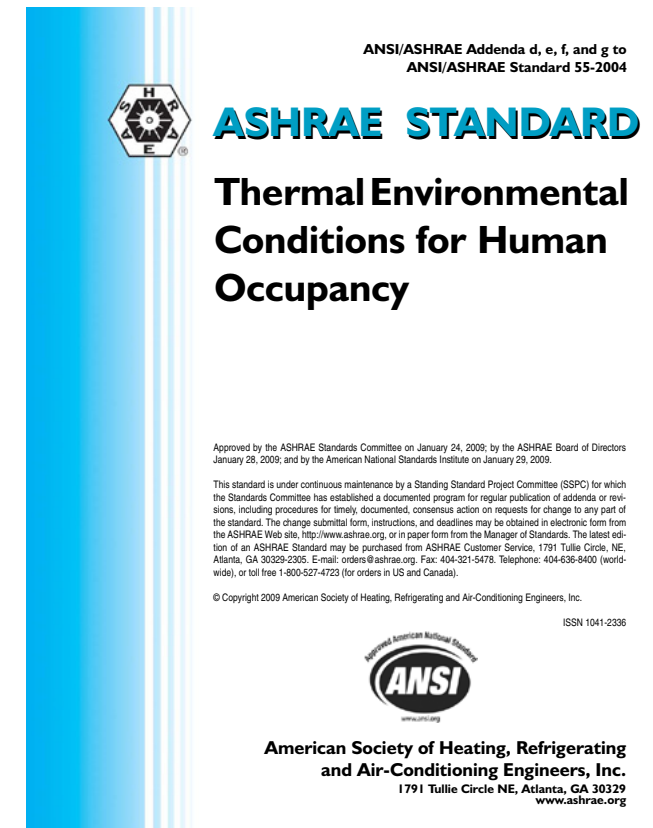
1 POINT

LEED CREDIT INTENT

To provide a comfortable thermal environment that promotes occupant productivity and well being.

LEED CREDIT REQUIREMENTS

Design HVAC systems and building envelope to meet the requirements of ASHRAE Standard 55-2004, Thermal Environmental Conditions for Human Occupancy.



UMA CREDIT DISCUSSION

The University expects all design teams to meet these credit requirements, except in cases where the optimal design for temperature and humidity fall outside of the range of ASHRAE 55 (greenhouses, for example).

UMA is making a concerted effort to close the loop between design/construction and operations and maintenance. For this reason, the transfer of O&M manuals is a particularly important aspect of this credit.

THERMAL COMFORT - VERIFICATION

IEQ CREDIT 7.2
1 POINT

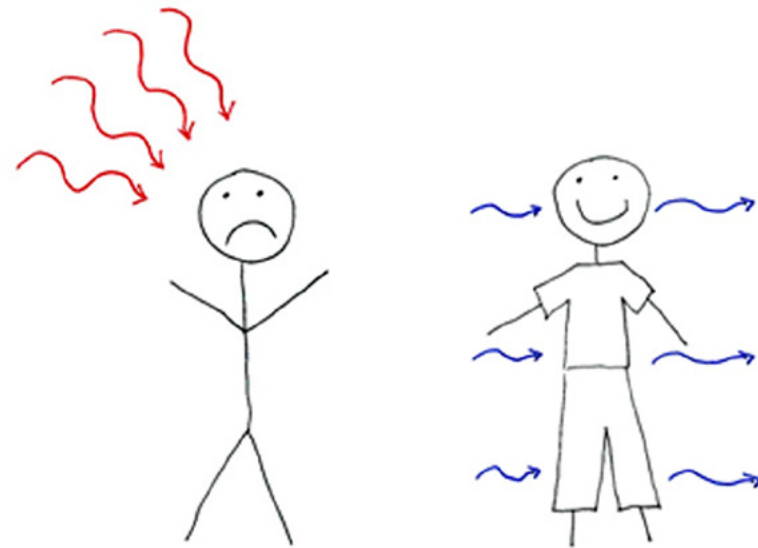
HIGH PRIORITY | EASY FEASIBILITY

LEED CREDIT INTENT

To provide for the assessment of building occupants' thermal comfort over time.

LEED CREDIT REQUIREMENTS

- Provide a permanent monitoring system to ensure that building performance meets the desired comfort criteria as determined by IEQ Credit 7.1: Thermal Comfort—Design.
- Conduct a thermal comfort survey of building occupants within 6 to 18 months after occupancy.
 - Anonymous responses about thermal comfort in the buildings
 - Assessment of overall thermal performance
 - Identification of thermal comfort problems
- Develop a plan for corrective action if the survey results indicate that more than 20% of occupants are dissatisfied with thermal comfort.



UMA CREDIT DISCUSSION

Providing a feedback loop between building occupants and building operations staff is crucial for creating comfortable learning and living environments. Project teams should coordinate with UMA staff to develop a thermal comfort survey implementation plan.

In addition, teams should design systems as part of the Building Automation System (BAS), so that ongoing thermal comfort data can be studied in conjunction with energy use data.

DAYLIGHT AND VIEWS - DAYLIGHT

IEQ CREDIT 8.1
1 POINT (+1 EXEMPLARY)

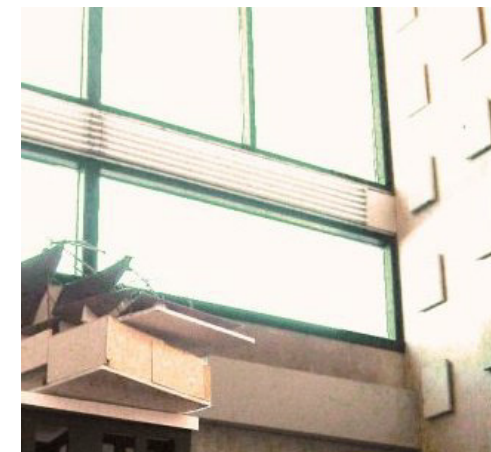
MEDIUM PRIORITY | MODERATE FEASIBILITY

LEED CREDIT INTENT

To provide the building occupants with a connection between indoor spaces and the outdoors through the introduction of daylight and views into the regularly occupied areas of the building.

LEED CREDIT REQUIREMENTS

- Achieve daylighting in 75% of the regularly occupied spaces.
- Minimum of 25 and maximum of 500 footcandles in a clear sky condition on September 21 at 9am and 3pm.
- Project teams may earn an exemplary point by achieving daylighting in 95% of regularly occupied spaces.



PERMANENT LIGHTING,
FINE ARTS CENTER



WESTERN GLAZING, SKINNER HALL

UMA CREDIT DISCUSSION

Whether or not to pursue this credit will depend on the building design. Fenestration should be balanced with energy use (heating/cooling) and space function. Architectural strategies including solar shading, light shelves, and building orientation should be explored to maximize the useful daylight while minimizing unwanted solar gain and glare. Effective implementation of these techniques should produce an indoor environment that improves occupant productivity and comfort.

Although not required by this credit, design teams are expected to include automatic dimming controls for electric lighting to take advantage of daylighting and energy cost savings.

DAYLIGHT AND VIEWS - VIEWS

IEQ CREDIT 8.2
1 POINT (+1 EXEMPLARY)

LOW PRIORITY | MODERATE FEASIBILITY

LEED CREDIT INTENT

To provide the building occupants with a connection between indoor spaces and the outdoors through the introduction of daylight and views into the regularly occupied areas of the building.

LEED CREDIT REQUIREMENTS

Achieve a direct line of sight to the outdoor environment via vision glazing between 30 inches and 90 inches above the finish floor for building occupants in 90% of all regularly occupied areas.

An exemplary point may be earned by meeting 2 of the following 4 measures:

- 90% have multiple views at least 90° apart
- 90% have views of vegetation, human activity, or objects at least 70' away from exterior of glazing
- 90% have views located within the distance of 3x the head height of the vision glazing
- 90% have access to views with a view factor of 3 or greater.



NORTHEAST RESIDENTIAL AREA

UMA CREDIT DISCUSSION

Direct line of sight to the outdoors allows valuable connections between the academic and social life inside buildings and the vibrant pedestrian and environmental life outside, and increases occupant productivity and well being. Our location on the Western slope of the Connecticut River Valley offers unique opportunities for scenic views that include campus buildings in the foreground, farms in the middle ground, and the Berkshire mountains in the background.

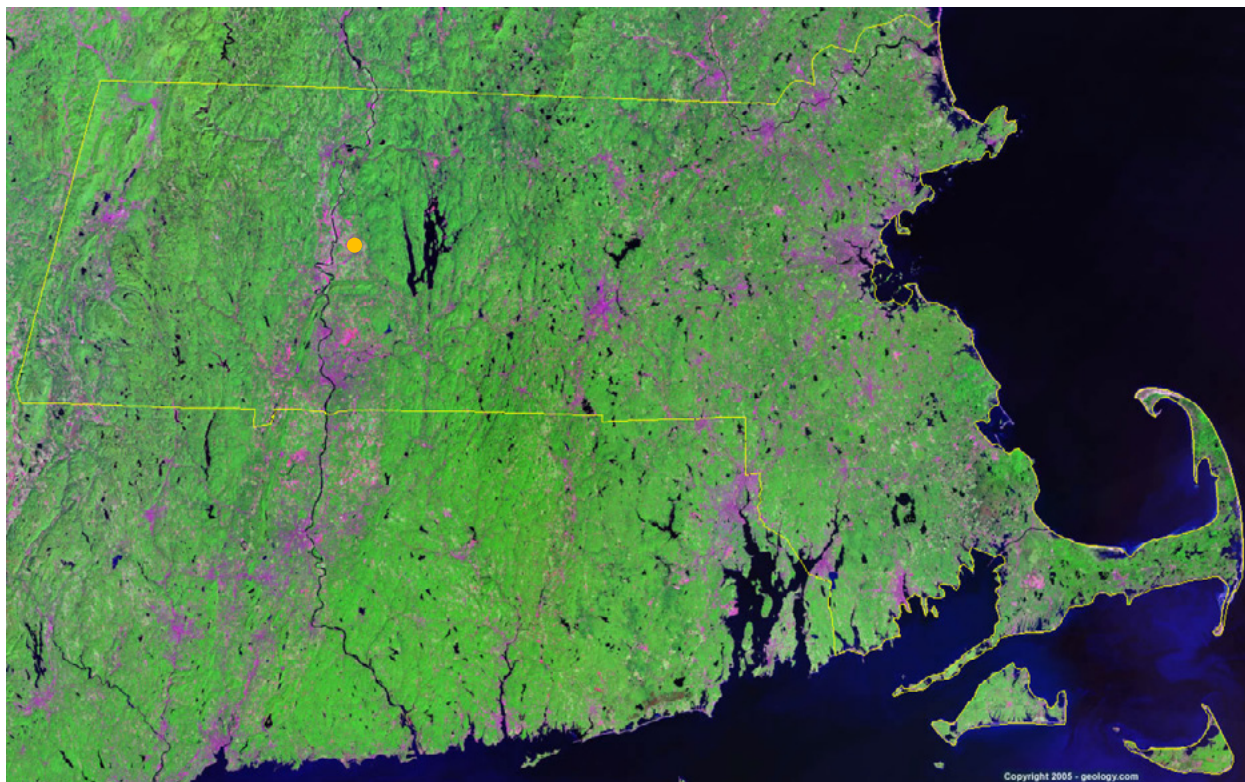
While most programmed areas on campus would benefit from views to the outdoors, some spaces, like lecture halls and laboratories, may not. Additionally, building footprints that minimize the perimeter-to-area ratio will make this credit difficult to achieve. Design teams should consider views, programmatic needs, and building flexibility when placing windows and walls.



RP CATEGORY

REGIONAL PRIORITY FINDINGS

- The University resides in the Pioneer Valley, a region made up of Franklin, Hampshire, and Hampden counties.
- Approximately 15,000 year ago, the pre-glacial Lake Hitchcock was formed by sediment damming the Connecticut River Valley near Middletown, CT. At its largest, this lake stretched 200 miles from Rocky Hill, CT to St. Johnsbury, VT.
- Accumulation of the fine sediments of Lake Hitchcock account for the excellent rich soils of the Pioneer Valley, which has been called the Breadbasket of New England. The rich soil was an influential factor in the sighting of Massachusetts Agricultural College, the institution that later became the University of Massachusetts.



In writing these guidelines, UMA has essentially created our own Regional Priority credits. However, the six credits on the following page have been determined by the USGBC to have additional importance specific to this region.

Design teams should refer back to the credit page to understand the priority and feasibility established by the campus for each credit.

REGIONAL PRIORITY

POSSIBLE POINTS: 4	2 HIGH PRIORITY	0 EASY FEASIBILITY
	2 MEDIUM PRIORITY	3 MODERATE FEASIBILITY
	0 LOW PRIORITY	1 DIFFICULT FEASIBILITY

REGIONAL PRIORITY CREDITS

The six credits below have been designated regional priority credits by the USGBC for Amherst, MA. Projects will earn an additional point for achieving the basic requirements of these credits. Teams should refer to the credit page within the guidelines for UMA-specific information.

BROWNFIELD REDEVELOPMENT
SS Credit 3

MEDIUM PRIORITY | MODERATE FEASIBILITY

STORMWATER DESIGN - QUANTITY
SS Credit 6.1

HIGH PRIORITY | MODERATE FEASIBILITY

HEAT ISLAND - NON-ROOF
SS Credit 7.1

MEDIUM PRIORITY | MODERATE FEASIBILITY

INNOVATIVE WASTEWATER TECHNOLOGIES
WE Credit 2

MEDIUM PRIORITY | DIFFICULT FEASIBILITY

ON-SITE RENEWABLE ENERGY
EA Credit 2

HIGH PRIORITY | DIFFICULT FEASIBILITY

BUILDING REUSE - WALLS, FLOOR, ROOF
MR Credit 1.1

MEDIUM PRIORITY | MODERATE FEASIBILITY

ID CATEGORY

INNOVATION IN DESIGN FINDINGS

- A vibrant Eco-Rep program with 70 students across campus is dramatically changing the awareness of sustainability initiatives.
- Researchers at the University's Wind Energy Center study blade element momentum theory (BEM), potential flow analysis, and advanced turbulence modeling.
- The first student to earn a Master's in Green Building degree from a University graduated in May of 2010.
- A 1/4 acre permaculture garden has been created adjacent to the Franklin Dining commons. Its annual and perennial gardens will supply food directly to the University's dining services.



Innovation in Design credits can come from a range of sources, including the LEED Pilot Credit Library, exemplary achievement of existing credits, and borrowed credits from other LEED rating systems. Design teams can also create their own credits for this category, an approach which UMA encourages.

On the following pages, the University has outlined some of the credits which are of particular interest, or which dovetail especially well with campus priorities and policy.

Most importantly, we want to challenge design teams to challenge us with solutions for improving the environmental impact, user experience, and building performance.

INNOVATION IN DESIGN

POSSIBLE POINTS: 6

6 HIGH PRIORITY

0 MEDIUM PRIORITY

0 LOW PRIORITY

1 EASY FEASIBILITY

5 MODERATE FEASIBILITY

0 DIFFICULT FEASIBILITY

GUIDELINES FOR INNOVATION

Over the course of writing these guidelines, certain sustainable design concepts have emerged again and again as items which are especially important to the University. Design teams are expected to carefully consider the following as they define the project's green building goals and strategy for innovation credit attainment:

- Engage users to challenge and expand the limits of the human comfort zone.
- Share project data with the campus for research and education.
- Generate opportunities for future education about sustainable living and working.

The LEED rating system breaks the Innovation in Design Category into five distinct sections:

1. Exemplary Credits (1-3 points possible)
2. Pilot Library Credits (1 point possible)
3. Created Innovation Credits (1-5 points possible)
4. Borrowed Innovation Credits (1-5 points possible)
5. LEED AP Participation Credit (1 point possible)

Teams may earn a combination of credits from the above innovation categories; the total allowed is five points plus one for the LEED AP credit, or six total.

Because Innovation credits are especially dependant on project design, the University has not prioritized them in the same way as the rest of the LEED system. However, of particular importance are those credits which foster integrative design, whole systems thinking, and educational advancement. To that end, design teams are encouraged to pay particular attention to the innovative credits in the following pages which are marked with this icon:



In addition, design teams should be familiar with the other LEED rating systems (LEED for Existing Buildings, LEED for Schools, LEED for Neighborhood Development, LEED for Health Care) and consider incorporating credits from those systems into new construction for Innovation in Design points.

Above all else, design teams are asked to challenge the University by presenting new and innovative possibilities for sustainable design on campus.

EXEMPLARY CREDITS

The eight credits below have been designated high priority by UMA and can earn additional “exemplary performance” points if the following requirements are met.

SS 4.1: ALTERNATIVE TRANSPORTATION – PUBLIC TRANSPORTATION ACCESS

EXEMPLARY REQUIREMENTS

Locate project within ¼ mile of at least 2 stops for 4 or more bus lines and demonstrate frequency of service of at least 200 rides per day.

UMA CREDIT DISCUSSION

Depending on the project site, this credit may be readily attainable. Project teams should refer to the LEED GIS portal to determine whether project sites will meet these requirements.

SS 5.2: MAXIMIZE OPEN SPACE

EXEMPLARY REQUIREMENTS

Provide vegetated open space adjacent to the building that is double in area to the building footprint.

UMA DISCUSSION

This credit is dependent on the LEED Project boundary. Decisions about open space use should be made in close conversation with Campus Planners.

SS 6.2: STORMWATER QUALITY CONTROL

EXEMPLARY REQUIREMENTS

Project teams may earn an exemplary performance point by documenting a comprehensive approach to capture and treat stormwater and demonstrate performance above and beyond the credit requirements.

UMA DISCUSSION

Stormwater treatment continues to be an issue on campus and teams are encouraged to explore potential strategies for going beyond MassDEP regulations and basic LEED credit requirements.

MR 2: CONSTRUCTION WASTE MANAGEMENT

EXEMPLARY REQUIREMENTS

Recycle and/or salvage at least 95% of construction and demolition waste.

UMA DISCUSSION

Earning this additional point will depend largely on the type of project. Reaching the 95% threshold for recycled construction and demolition waste is difficult, and will take concerted effort. Project teams are encouraged to obtain references and examples of past projects from waste contractors if pursuing this.

MR 7: CERTIFIED WOOD

EXEMPLARY REQUIREMENTS

95% of all wood-based materials must be certified by the FSC.

UMA DISCUSSION

For projects designed with very little wood, this exemplary point may be readily attainable.

EA 1: OPTIMIZE ENERGY PERFORMANCE

EXEMPLARY REQUIREMENTS

Using the whole building energy simulation option, show an energy cost savings of 50% over baseline for new construction (46% for major renovations).

UMA DISCUSSION

Depending on the building type, this exemplary point may be attainable. Project teams are encouraged to employ a truly integrative design process in order to reach the highest percentage threshold possible.

EA 2: ON-SITE RENEWABLE ENERGY

EXEMPLARY REQUIREMENTS

Generate 15% of the total building energy needed using renewable sources.

UMA DISCUSSION

The use of renewable energy (especially solar) for new projects is encouraged. Before designing renewable energy into a project, teams should make every effort to create an efficient building with a low overall energy load.

EA 3: ENHANCED COMMISSIONING

EXEMPLARY REQUIREMENTS

Conduct comprehensive commissioning of the building envelope.

UMA DISCUSSION

The University considers this exemplary credit to be of the utmost importance. Design teams should prioritize envelope commissioning for all projects.

PILOT CREDITS

The LEED Pilot Credit Library is intended to introduce new credits to the LEED rating system which haven't yet been through the complete drafting and balloting process. Teams are encouraged to explore the following pilot credits for potential innovation points.

PILOT CREDIT: INNOVATIVE VENTILATION

REQUIREMENTS

- Design systems that utilize innovative ventilation strategies
 - Displacement ventilation
 - Under-floor air delivery systems
 - Natural ventilation
- Design natural ventilation systems in accordance with the Chartered Institution of Building Services Engineers (CIBSE) Applications Manual AM10, "Natural Ventilation in Non-Domestic Buildings", March 2005.
- Determine that natural ventilation is an effective strategy for the project by following the flow diagram process shown in Figure 2.8 of the CIBSE Applications Manual AM10, March 2005.

UMA CREDIT DISCUSSION

This credit is a high priority because it encourages the integration of thermal comfort and energy efficiency. It is not advised for certain types of buildings such as labs – where temperature and humidity need to be closely regulated – but may be an excellent solution for dormitories, offices, and classrooms. Design teams should consider other sustainable design strategies which can compliment and support natural ventilation, including thermal mass and daylighting.

PILOT CREDIT: PRELIMINARY INTEGRATIVE PROJECT PLANNING AND DESIGN

REQUIREMENTS

- Use cross discipline design and decision making beginning in the programming and pre-design phase.
- Before schematic design, conduct a preliminary LEED meeting including a minimum of four key project team members, including the Owner or Owner's representative. As part of the meeting, create a LEED action plan that, at a minimum, includes the following:
 - The targeted LEED award level (Certified, Silver, Gold, or Platinum);
 - The LEED credits that have been selected to meet the targeted award level; and
 - The primary responsible party selected to meet the LEED requirements for each prerequisite or credit.
- Before schematic design, conduct at least one full-day integrative design workshop with the Integrative Project Team.

UMA DISCUSSION

Integrative planning and design is critical to the execution of truly sustainable buildings. Most of these credit requirements are common practice at UMA, and achievement of this pilot credit will help assure a successful process that involves all campus stakeholders.

PILOT CREDIT: INTEGRATIVE PROJECT PLANNING AND DESIGN

REQUIREMENTS

- Use cross discipline design and decision making for all phases of design and construction.
- Achieve Pilot Credit 5: Preliminary Integrative Project Planning & Design
- Actively involve all team members referenced above in at least three of the following phases of project design and construction process:
 - Conceptual/schematic design
 - LEED planning
 - Preliminary design
 - Energy/envelope systems analysis or design
 - Design development
 - Final design, construction documents and specifications
 - Construction Administration
- Conduct meetings with the project team at least monthly to review project status, introduce new team members to project goals, discuss problems encountered, formulate solutions, review responsibilities, and identify next steps. In these meetings, utilize the process framework established by the ANSI Market Transformation to Sustainability Guideline Standard March 2007 revision for distribution Whole System Integration Process (WSIP).

UMA DISCUSSION

Maintaining integrative design through construction administration challenges the status quo. Teams are encouraged to achieve this credit and to go beyond credit requirements to include diverse team members throughout all phases of project design and construction.

LEED ACCREDITED PROFESSIONAL

The USGBC awards one point if the active members of the project team include a LEED Accredited Professional.

LEED CREDIT INTENT

To support and encourage the design integration required by LEED to streamline the application and certification process.

LEED CREDIT REQUIREMENTS

At least 1 principal participant of the project team shall be a LEED Accredited Professional (AP).



“IT’S LIKE ORDERING PICKLES WITH YOUR HAMBURGER”
-JEFF QUACKENBUSH, LEAD CAPITAL PROJECT MANAGER, UMA

A tremendous thank you to Ludmilla Pavlova and Jeff Quackenbush. Without their patience, guidance, and knowledge these guidelines would never have achieved this level of depth and relevance.

The conversation between design teams and the University is ongoing and is as much a part of sustainable design as the LEED credits within these pages. It is our hope that these guidelines will foster a deeper understanding of environmental issues on the University of Massachusetts Amherst campus and lead to buildings which are long-lasting, sensitive, and sustainable.

UMA CREDIT DISCUSSION

While incorporating a LEED AP in the design process has become industry standard and is common practice for new construction at UMA, LEED AP credentials are not a necessary part of a team committed to sustainable design.