

**SECTION 6 -
GOALS AND SOLUTIONS**



Iowa Sustainable Design Initiative



SECTION 6 - GOALS AND SOLUTIONS

Sustainable Goals and Solutions



Existing native vegetation at the Iowa Laboratories Facility, Ankeny, Iowa.

Overview

While this guide does not specifically focus on achieving a LEED (Leadership in Energy and Environmental Design)[™] rating, it is recognized that LEED is becoming the nationally accepted standard for what constitutes a green building. Therefore, Section 6, Sustainable Goals and Solutions, parallels LEED. This will allow the section to be useful for all projects whether they are pursuing a LEED rating or not. In fact, local resources are provided for many LEED prerequisites and credits; this should help make the process of integrating LEED requirements easier. LEED 2.1 credit intents and requirements have been reprinted in this section with permission from the U.S. Green Building Council. This information is the property of the USGBC. For reference or more information refer to the USGBC Internet site at <http://www.usgbc.org/>. LEED information is updated on a regular basis, so you are encouraged to refer to the website regularly.

The intent of the spreadsheet in this section is to provide the reader with a list of possible sustainable solutions that can be integrated into any type of project. As noted in Section One, Guide Overview, there are many solutions that will be applicable to most projects (although there are always exceptions). There are also many solutions that need to be considered on a project-by-project basis.

The spreadsheet is organized into the primary sustainable design categories with icons symbolizing each category:



Sustainable Sites



Water Efficiency



Energy & Atmosphere



Materials & Resources



Indoor Environmental Quality

Sustainable Goals and Solutions

Within each category, sustainable design goals are listed. These are copied from LEED Credit Intents. The sustainable solutions presented are organized by the goal they will achieve in each category. For example, in the Sustainable Sites portion of the spreadsheet, the first goal listed is, “control erosion to reduce negative impacts on water and air quality.” The sample solution is, “use an erosion and sediment control plan for the project site during construction.” Some goals have more than one associated solution. Some of the solutions are also copied directly from LEED.

Within each category, the spreadsheet contains the following information:

Goal: The goal describes the intent of the particular solution to address some factor of the environment and/or health that is impacted by design and construction.

Sample Solutions: Sample solutions are design or construction solutions that may allow the goal to be realized.

Iowa Code or Standard (if applicable): Related Iowa standard(s), if applicable, are referenced.

Related Resources, Initiatives, and/or Case Studies: Links to resources, related initiatives, and case studies are provided to assist the reader in locating more information about the sustainable solution. The case studies include examples of where a particular solution has been integrated. Local and regional solutions were provided where available, although national examples are also included. The resources at the end of this section also provide access to hundreds of sustainable design solutions.

LEED Requirement (if applicable): The related LEED credit name and associated requirement, if applicable, is referenced.

How to Use This Section

There are a number of ways this section may be used. Becoming familiar with the content will allow the reader to determine how it can best be used in a particular situation.


- If a building owner is particularly interested in a category of sustainable design (energy efficiency, for example), that section of the spreadsheet can be used.
- The sample solutions column in the spreadsheet can be used as a checklist to consider potential sustainable solutions.

Sustainable Goals and Solutions

- If a LEED rating is desired, the spreadsheet can be used to research projects in Iowa that have used materials or technologies similar to those presented in individual LEED credits.
- The spreadsheet may also be used to find Iowa resources for sustainable design assistance, initiatives, and services.

If a LEED rating is desired, a project will need to be registered and certified with the USGBC. USGBC requires the collection of specific documentation related to each prerequisite and credit. For more information, visit the LEED portion of the USGBC internet site. Also refer to Appendix A, Cost of LEED.

IOWA SUSTAINABLE DESIGN GUIDE GOALS AND SOLUTIONS MATRIX

A Goal	B Sample Solutions	C Iowa Code or Law (if applicable)	D Related Resources, Initiatives and/or Case Studies	E LEED Requirement
SUSTAINABLE SITES				
<p>1</p>  <p>Control erosion to reduce negative impacts on water and air quality.</p>	<p>Use an erosion and sediment control plan for the project site during construction.</p>		<p>1. United States Environmental Protection Agency Document No. E-832/R-92-005, Storm Water Management for Construction Activities, Chapter 3 (LEED Reference).</p> <p>2. Pamphlet: Reducing Construction Site Runoff. Published by the Iowa Farm Bureau Federation and Bremer County Farm Bureau. Website: http://www.extension.iastate.edu/Pages/bremer/Non-pointsourcepollution_files/brochures/Reducing%20Construction%20Site%20Runoff.pdf</p> <p>3. Iowa Association of Municipal Utilities Construction Site Erosion and Sedimentation Control Best Management Practices. Website: http://www.iamu.org/main/stormwater.htm</p>	<p>Site Prerequisite: Erosion and Sedimentation Control ; no credit. Design a sediment and erosion control plan, specific to the site, that conforms to United States Environmental Protection Agency (EPA) Document No. EPA 832/R-92-005 (September 1992), Storm Water Management for Construction Activities, Chapter 3, OR local erosion and sedimentation control standards and codes, whichever is more stringent. The plan shall meet the following objectives:</p> <ul style="list-style-type: none"> • Prevent loss of soil during construction by stormwater runoff and/or wind erosion, including protecting topsoil by stockpiling for reuse. • Prevent sedimentation of storm sewer or receiving streams. • Prevent polluting the air with dust and particulate matter.
<p>3</p> <p>Avoid development of inappropriate sites and reduce the environmental impact from the location of a building on a site.</p>	<p>During site selection, give preference to those sites that do not include sensitive site elements and restrictive land types.</p>		<p>1. Federal Register, 40CFR, Parts 230-233, and Part 22 (LEED Reference)</p> <p>2. Iowa's Threatened and Endangered Species Program. A list of threatened and endangered species is available at the Website. Website: http://www.state.ia.us/dnr/organiza/ppd/t&e.htm</p> <p>3. IDNR summary of Federal Emergency Management Agency mapping issues and maps available concerning 100-year flood plain. Website: http://www.state.ia.us/epd/wastewtr/feedlot/mmta/files/exhibit13.pdf</p>	<p>Site Selection; Credit 1; 1 point available Do not develop buildings, roads or parking areas on portions of sites that meet any one of the following criteria:</p> <ul style="list-style-type: none"> • Prime farmland as defined by the United States Department of Agriculture in the United States Code of Federal Regulations, Title 7, Volume 6, Parts 400 to 699, Section 657.5 (citation 7CFR657.5). • Land whose elevation is lower than 5 feet above the elevation of the 100-year flood as defined by the Federal Emergency Management Agency (FEMA). • Land which is specifically identified as habitat for any species on Federal or State threatened or endangered lists. • Within 100 feet of any water including wetlands as defined by United States Code of Federal Regulations 40 CFR, Parts 230-233 and Part 22, and isolated wetlands or areas of special concern identified by state or local rule, OR greater than distances given in state or local regulations as defined by local or state rule or law, whichever is more stringent. • Land which prior to acquisition for the project was public parkland, unless land of equal or greater value as parkland is accepted in trade by the public landowner (Park Authority projects a
<p>4</p> <p>Channel development to urban areas with existing infrastructures, protecting greenfields and preserving habitat and natural resources.</p>	<p>During the site selection process, give preference to urban sites.</p>		<p>1. 1000 Friends of Iowa (Citizens United for Responsible Land Use). Website: http://www.kfoi.org/kfoi_index.html</p> <p>2. Smart Growth Online, a Service of the Smart Growth Network. This site is organized by state and is regularly updated. Website: http://www.smartgrowth.org/news/bystate.asp?state=IA</p>	<p>Development Density; Credit 2 . 1 point available. Increase localized density to conform to existing or desired density goals by utilizing sites that are located within an existing minimum development density of 60,000 square feet per acre (two story downtown development).</p>
<p>5</p> <p>Rehabilitate damaged sites where development is complicated by real or perceived environmental contamination, reducing pressure on undeveloped land.</p>	<p>During the site selection process, give preference to brown field sites. Identify any tax incentives and property cost savings.</p>	<p>1. The new federal brownfield redevelopment law known as the "Small Business Liability and Brownfields Revitalization Act" became law on January 11, 2002. The Iowa Department of Economic Development provides information to help Iowans understanding this law and provides sources of funding available. Website: www.iowasmart.com/brownfields/pdf/factsheet.pdf</p> <p>2. Iowa Brownfield's Statute: The Iowa Physical Infrastructure Assistance Program. Passed during the 1996 session, the Iowa Physical Infrastructure Assistance Program is a mini Brownfields statute which mimics certain aspects of the EPA's program. Website: http://members.aol.com/IowaLegal/brownfil.htm</p>	<p>1. ASTM E1903-97 Phase II Environmental Site Assessment (LEED Reference)</p> <p>2. Iowa Brownfield Redevelopment Program. Website: http://www.iowasmart.com/brownfields/programs.html</p>	<p>Brownfield Redevelopment; Credit 3 ; 1 point available. Develop on a site documented as contaminated (by means of an ASTM E1903-97 Phase II Environmental Site Assessment) OR on a site classified as a Brownfield by a local, state or federal government agency. Effectively remediate site contamination.</p>
<p>6</p>				

IOWA SUSTAINABLE DESIGN GUIDE GOALS AND SOLUTIONS MATRIX

A Goal	B Sample Solutions	C Iowa Code or Law (if applicable)	D Related Resources, Initiatives and/or Case Studies	E LEED Requirement
1 Reduce pollution and land development impacts from automobile use.	Locate projects near mass transit.		Iowa Public Transit Association - <a -="" bikes="" href="http://www.iapublictransit.com/Bikes on Map - " http:="" on="" trans.html"="" transit"="" www.bikemap.com="">http://www.iapublictransit.com/Bikes on Map - "Bikes on Transit" - http://www.bikemap.com/trans.html	Alternative Transportation; Credit 4.1 ; 1 point available. Locate project within 1/2 mile of a commuter rail, light rail or subway station or 1/4 mile of two or more public or campus bus lines usable by building occupants.
7	Design the building with transportation amenities such as bicycle racks and showering / changing facilities.		Bicycle Parking: The Basics. This informational brochure addresses considerations for bicycle parking such as choosing bike racks and locating racks. Website: www.bicyclinginfo.org/de/park_basics.htm ;	Alternative Transportation; Credit 4.2 ; 1 point available. For commercial or institutional buildings, provide secure bicycle storage with convenient changing/shower facilities (within 200 yards of the building) for 5% or more of regular building occupants. For residential buildings, provide covered storage facilities for securing bicycles for 15% or more of building occupants in lieu of changing/shower facilities.
8 9	Provide alternative fuel refueling stations.	1. Incentives and regulations for alternative vehicles in Iowa. Website: http://altfuels.centerpointenergy.com/states/Iowa.doc 2. U.S. Department of Energy Clean Cities Program. This program provides information by state regarding alternative fuel vehicle regulations and incentives. Website: http://www.cities.doe.gov/vbg/fleets/progs/search_incentive.cgi		Alternative Transportation; Credit 4.3 ; 1 point available. Provide alternative fuel vehicles for 3% of building occupants AND provide preferred parking for these vehicles, OR install alternative-fuel refueling stations for 3% of the total vehicle parking capacity of the site. Liquid or gaseous fueling facilities must be separately ventilated or located outdoors.
10	Provide preferred parking for carpools.		1. The University of Iowa Parking & Transportation Department is sponsoring a pilot ridesharing program for UI faculty/staff. Website: http://www.uiowa.edu/~parking/TRIP_home.html 2. Des Moines MTA Rideshare program - http://www.dmmta.com/carpools_carpools.html 3. Iowa Carpool Listings http://www.erideshare.com/states/iowa.htm	Alternative Transportation; Credit 4.3 ; 1 point available. Provide alternative fuel vehicles for 3% of building occupants AND provide preferred parking for these vehicles, OR install alternative-fuel refueling stations for 3% of the total vehicle parking capacity of the site. Liquid or gaseous fueling facilities must be separately ventilated or located outdoors.
11	Minimize parking lot / garage size. Consider sharing parking with adjacent buildings.			Alternative Transportation; Credit 4.4 ; 1 point available. Size parking capacity to meet, but not exceed, minimum local zoning requirements AND provide preferred parking for carpools or vanpools capable of serving 5% of the building occupants; OR add no new parking for rehabilitation projects AND provide preferred parking for carpools or vanpools capable of serving 5% of the building occupants.
12	Conserve existing natural areas and restore damaged areas to provide habitat and promote biodiversity.	Perform a site survey to identify site elements and adopt a master plan for the project site.		N/A
13	Restore vegetation that has previously been disturbed, preferably with native vegetation.		1. The Iowa Ecotype Project (IEP) is an integrated, working model for supplying high-quality, genetically diverse, regionally adapted native seed for prairie restorations in Iowa. Website: http://www.uni.edu/ecotype/ 2. Iowa Native Plants Mailing List. Website: http://www.cgrer.uiowa.edu/herbarium/mailling_list.htm	Reduced Site Disturbance; Credit 5.1 ; 1 point available. On greenfield sites, limit site disturbance including earthwork and clearing of vegetation to 40 feet beyond the building perimeter, 5 feet beyond primary roadway curbs, walkways and main utility branch trenches, and 25 feet beyond constructed areas with permeable surfaces (such as pervious paving areas, stormwater detention facilities and playing fields) that require additional staging areas in order to limit compaction in the constructed area; OR, on previously developed sites, restore a minimum of 50% of the site area (excluding the building footprint) by replacing impervious surfaces with native or adaptive vegetation.
14	Provide a plan to protect the site during construction.			Reduced Site Disturbance; Credit 5.1 ; 1 point available.
15	Consider reducing the building footprint or providing underground parking.			Reduced Site Disturbance; Credit 5.2 ; 1 point available. Reduce the development footprint (defined as entire building footprint, access roads and parking) to exceed the local zoning's open space requirement for the site by 25%. For areas with no local zoning requirements (e.g., some university campuses and military bases), designate open space area adjacent to the building that is equal to the development footprint.
16	Limit disruption of natural water flows by managing stormwater runoff.	Specify vegetated roofs.	Iowa Water Pollution Control Association - http://www.iawpca.org/about/about.htm	Stormwater Management; Credit 6.1 ; 1 point available. If existing imperviousness is less than or equal to 50%, implement a stormwater management plan that prevents the post-development 1.5 year, 24 hour peak discharge rate from exceeding the pre-development 1.5 year, 24 hour peak discharge rate. OR If existing imperviousness is greater than 50%, implement a stormwater management plan that results in a 25% decrease in the rate and quantity of stormwater runoff.
17	Capture rainwater from the roof for reuse.		American Rainwater Catchment Systems Association. Website: http://www.arcsa-usa.org/	Stormwater Management; Credit 6.1

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1 18	Reuse stormwater volumes generated for non-potable uses such as landscape irrigation, toilet and urinal flushing and custodial uses.			Stormwater Management; Credit 6.1
19	Use porous or pervious paving for non-roof surfaces.			Stormwater Management; Credit 6.1
20	Design mechanical or natural treatment systems such as constructed wetlands, vegetated filter strips and bioswales to treat the site's stormwater.		1. The Indian Creek Nature Center in Cedar Rapids uses wetlands to treat runoff. Website: http://www.indiancreeknaturecenter.org/about.asp 2. The Iowa Association of Municipal Utilities uses measures such as temporary sediment basins, constructed wetlands, compost, silt fences, temporary seeding, and grassy swales. Website: http://www.sustainable.doe.gov/success/iamu.shtml	Stormwater Management; Credit 6.2 ; 1 point available. Construct site stormwater treatment systems designed to remove 80% of the average annual post-development total suspended solids (TSS) and 40% of the average annual post-development total phosphorous (TP) based on the average annual loadings from all storms less than or equal to the 2-year/24-hour storm. Do so by implementing Best Management Practices (BMPs) outlined in Chapter 4, Part 2 (Urban Runoff), of the United States Environmental Protection Agency's (EPA's) Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, January 1993 (Document No. EPA-840-B-92-002) or the local government's BMP document (whichever is more stringent).
21	Reduce heat islands (thermal gradient differences between developed and undeveloped areas) to minimize impact on microclimate and human and wildlife habitat.		Lawrence Berkeley National Lab Heat Islands Group. Website: http://eetd.lbl.gov/HeatIsland/	Heat Island Effect; Credit 7.1 ; 1 point available. Provide shade (within 5 years) and/or use light-colored/high-albedo materials (reflectance of at least 0.3) and/or open grid pavement for at least 30% of the site's non-roof impervious surfaces, including parking lots, walkways, plazas, etc.; OR place a minimum of 50% of parking spaces underground or covered by structured parking; OR use an open-grid pavement system (less than 50% impervious) for a minimum of 50% of the parking lot area.
22	Minimize the overall building footprint and impervious surfaces.			N/A
23	Use open grid paving or specify high-albedo materials for non-roof surfaces.		Lawrence Berkeley National Lab Cool Pavements page. Website: http://eetd.lbl.gov/HeatIsland/Pavements/	Heat Island Effect; Credit 7.1; 1 point available.
24	Consider installing high-albedo and/or vegetated roofs.		1. Web site with information on vegetated roofing - http://www.greenroofs.com/ 2. Energy Star Cool Roofs program. Website http://www.nationalcoatings.com/coolroof/estar/	Heat Island Effect; Credit 7.2 ; 1 point available. Use ENERGY STAR® compliant (highly reflective) AND high emissivity roofing (emissivity of at least 0.9 when tested in accordance with ASTM 408) for a minimum of 75% of the roof surface; OR install a "green" (vegetated) roof for at least 50% of the roof area. Combinations of high albedo and vegetated roof can be used providing they collectively cover 75% of the roof area.
25	Eliminate light trespass from the building site, improve night sky access, and reduce development impact on nocturnal environments.	1. Text for proposed statute for state facilities & light pollution reduction. Website: http://www.darksky.org/ordsregs/bystate/ia/ia-ssb 3035.pdf 2. Ames Iowa Light Pollution Ordinance. Website: http://home.att.net/~icole/ames_ia_ord.html	1. The Dark Sky Institute - http://darkskyinstitute.org/DarkSky/SaveMilkyWay.html 2. National states governing dark sky legislation: http://www.darksky.org/ordsregs/usastate.html	Light Pollution Reduction; Credit 8 ; 1 point available. Use ENERGY STAR® compliant (highly reflective) AND high emissivity roofing (emissivity of at least 0.9 when tested in accordance with ASTM 408) for a minimum of 75% of the roof surface; OR install a "green" (vegetated) roof for at least 50% of the roof area. Combinations of high albedo and vegetated roof can be used providing they collectively cover 75% of the roof area.

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WATER EFFICIENCY				
26	Limit or eliminate the use of potable water for landscape irrigation.	Ames Mandatory Water Conservation Ordinance. Website: http://www.city.ames.ia.us/WaterWeb/Water_Plant/water_ration.htm	Federal Energy Management Program Water Conservation Best Practices: BMP#3 "Water Efficient Landscaping". Website: http://www.eere.energy.gov/femp/techassist/BMP3.html	<p>Water Efficient Landscaping; Credit 1.1 ; 1 points available. Use high-efficiency irrigation technology OR use captured rain or recycled site water to reduce potable water consumption for irrigation by 50% over conventional means.</p> <p>Water Efficient Landscaping; Credit 1.2; 1 points available. Use only captured rain or recycled site water to eliminate all potable water use for site irrigation (except for initial watering to establish plants), OR do not install permanent landscape irrigation systems.</p>
27	Collect and reuse rainwater for irrigation.		American Rainwater Catchment Systems Association. Website: http://www.arcsa-usa.org/	<p>Water Efficient Landscaping; Credit 1.1 ; 1 points available. Use high-efficiency irrigation technology OR use captured rain or recycled site water to reduce potable water consumption for irrigation by 50% over conventional means.</p> <p>Water Efficient Landscaping; Credit 1.2; 1 points available. Use only captured rain or recycled site water to eliminate all potable water use for site irrigation (except for initial watering to establish plants), OR do not install permanent landscape irrigation systems.</p>
28	Use greywater for irrigation.			<p>Water Efficient Landscaping; Credit 1.1 ; 1 points available. Use high-efficiency irrigation technology OR use captured rain or recycled site water to reduce potable water consumption for irrigation by 50% over conventional means.</p> <p>Water Efficient Landscaping; Credit 1.2; 1 points available. Use only captured rain or recycled site water to eliminate all potable water use for site irrigation (except for initial watering to establish plants), OR do not install permanent landscape irrigation systems.</p>
29	Reduce the generation of wastewater and potable water demand, while increasing the local aquifer recharge.	Use high-efficiency fixtures and dry fixtures.		<p>Innovative Wastewater Technologies; Credit 2 ; 1 point available. Reduce the use of municipally provided potable water for building sewage conveyance by a minimum of 50%, OR treat 100% of wastewater on site to tertiary standards.</p>
30	Consider reusing stormwater or greywater for sewage conveyance.		A web site dedicated to greywater - what it is, how to treat it, and how to use it. Website: http://www.greywater.com	<p>Innovative Wastewater Technologies; Credit 2 ; 1 point available.</p>
31	Consider on-site wastewater treatment systems.	In Iowa, local boards of health have primary responsibility for regulation of septic tanks serving less than 15 people, while DNR has primary responsibility for larger (public) systems. Iowa Water Quality Bureau Website: http://www.state.ia.us/epd/wastewtr/septic/septic.htm		<p>Innovative Wastewater Technologies; Credit 2 ; 1 point available.</p>
32	Maximize water efficiency within buildings to reduce the burden on municipal supply and wastewater systems.	Use high-efficiency fixtures and dry fixtures. Consider reusing stormwater or greywater for sewage conveyance or on-site wastewater treatment systems.	Energy Policy Act of 1992 fixture performance requirements (LEED Reference).	<p>Water Use Reduction; Credit 3.1 ; 1 point available. Employ strategies that in aggregate use 20% less water than the water use baseline calculated for the building (not including irrigation) after meeting the Energy Policy Act of 1992 fixture performance requirements.</p> <p>Water Use Reduction; Credit 3.2 ; 1 point available. Employ strategies that in aggregate use 30% less water than the water use baseline calculated for the building (not including irrigation) after meeting the Energy Policy Act of 1992 fixture performance requirements.</p>
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ENERGY and ATMOSPHERE																																					
34 Verify and ensure that fundamental building elements and systems are designed, installed and calibrated to operate as intended.	Include commissioning requirements in bid documents.		1. The Portland Energy Conservation, Inc. Internet site houses many resources related to commissioning, including sample specifications and plans. Website: www.peci.org 2. Lawrence Berkeley Lab, Diagnostics for Building Commissioning & Operation. Website: http://eetd.lbl.gov/BTP/iit/diag/	Prerequisite 1; Fundamental Building Systems Commissioning ; no credit. Implement or have a contract in place to implement the following fundamental best practice commissioning procedures. <ul style="list-style-type: none"> Engage a commissioning team that does not include individuals directly responsible for project design or construction management. Review the design intent and the basis of design documentation. Incorporate commissioning requirements into the construction documents. Develop and utilize a commissioning plan. Verify installation, functional performance, training and operation and maintenance documentation. Complete a commissioning report. 																																	
35 Engage the commissioning authority early in the design phases.	Engage the commissioning authority early in the design phases.		The Building Commissioning Association BCA promotes building commissioning practices that maintain high professional standards, and fulfill building owners' expectations. Website: http://www.bcx.org/	Energy Credit 3; Additional Commissioning ; 1 point available. In addition to the Fundamental Building Commissioning prerequisite, implement or have a contract in place to implement the following additional commissioning tasks: <ol style="list-style-type: none"> A commissioning authority independent of the design team shall conduct a review of the design prior to the construction documents phase. An independent commissioning authority shall conduct a review of the construction documents near completion of the construction document development and prior to issuing the contract documents for construction. An independent commissioning authority shall review the contractor submittals relative to systems being commissioned. Provide the owner with a single manual that contains the information required for re-commissioning building systems. Have a contract in place to review building operation with O&M staff, including a plan for resolution of outstanding commissioning-related issues within one year after construction completion date. 																																	
36 Establish the minimum level of energy efficiency for the base building and systems.	Use a computer simulation model to assess the energy performance.	Iowa Energy Code. ASHRAE/IESNA 90.1-1989 is mandatory statewide		Prerequisite 2; Minimum Energy Performance ; no credit. Design the building to comply with ASHRAE/IESNA Standard 90.1-1999 (without amendments) or the local energy code, whichever is more stringent.																																	
37 Achieve increasing levels of energy performance above the prerequisite standard to reduce environmental impacts associated with excessive energy use.			1. The State of Iowa's Department of Natural Resources (DNR) established a Building Energy Management Program to install all energy management improvements with an average payback of 6 years in all public and non-profit facilities statewide by 1995. Two initiatives support this program: the State of Iowa Facilities Improvement Corporation (SIFIC) and the Energy Bank Program. Incentives are available. Website: http://www.iclei.org/cases/c006-bem.htm 2. Iowa Department of Natural Resources Energy Success Case Studies. Website: http://www.state.ia.us/dnr/energy/MAIN/PUBS/BEM/ECA/SE/ 3. MidAmerican Energy's Commercial New Construction program encourages the design and construction of new – as well as the renovation of existing – energy-efficient commercial buildings in Iowa. Incentives are available to help offset the higher initial costs associated with the design and installation of energy-efficient options. The new (or renovated) building must receive its primary electricity from MidAmerican Energy. Where available, the direct supply of natural gas must also be provided by http://www.midamericanenergy.com/html/energy6h.asp	Energy Credit 1; Optimize Energy Performance ; 10 points available. Reduce design energy cost compared to the energy cost budget for energy systems regulated by ASHRAE/IESNA Standard 90.1-1999 (without amendments), as demonstrated by a whole building simulation using the Energy Cost Budget Method described in Section 11 of the Standard. <table border="1" data-bbox="1251 873 1501 1079"> <thead> <tr> <th>New Bldgs.</th> <th>Existing Bldgs.</th> <th>Points</th> </tr> </thead> <tbody> <tr><td>15%</td><td>5%</td><td>1</td></tr> <tr><td>20%</td><td>10%</td><td>2</td></tr> <tr><td>25%</td><td>15%</td><td>3</td></tr> <tr><td>30%</td><td>20%</td><td>4</td></tr> <tr><td>35%</td><td>25%</td><td>5</td></tr> <tr><td>40%</td><td>30%</td><td>6</td></tr> <tr><td>45%</td><td>35%</td><td>7</td></tr> <tr><td>50%</td><td>40%</td><td>8</td></tr> <tr><td>55%</td><td>45%</td><td>9</td></tr> <tr><td>60%</td><td>50%</td><td>10</td></tr> </tbody> </table> Regulated energy systems include HVAC (heating, cooling, fans and pumps), service hot water and interior lighting. Non-regulated systems include plug loads, exterior lighting, garage ventilation and elevators (vertical transportation). Two methods may be used to separate energy consumption for regulated systems. The energy consumption for each fuel may be prorated. If a comparison against ASHRAE/IESNA Standard 90.1-1999 has been established, then the comparison against the local code may be used in lieu of the Standard. Project teams are encouraged to apply for innovation credits if the energy consumption of non-regulated systems is less than that of the Standard.	New Bldgs.	Existing Bldgs.	Points	15%	5%	1	20%	10%	2	25%	15%	3	30%	20%	4	35%	25%	5	40%	30%	6	45%	35%	7	50%	40%	8	55%	45%	9	60%	50%	10
New Bldgs.	Existing Bldgs.	Points																																			
15%	5%	1																																			
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45%	35%	7																																			
50%	40%	8																																			
55%	45%	9																																			
60%	50%	10																																			
38 Reduce ozone depletion.	Conduct an inventory to identify equipment that uses chlorofluorocarbon (CFC) refrigerants and adopt a replacement schedule or specify new HVAC equipment that uses no CFC refrigerants.			Prerequisite 3; CFC Reduction In HVAC&R Equipment ; no credit. Zero use of CFC-based refrigerants in new base building HVAC&R systems. When reusing existing base building HVAC equipment, complete a comprehensive CFC phase-out conversion.																																	
39 40 For new buildings, specify refrigeration and fire suppression systems that use no hydro-chlorofluorocarbons (HCFCs) or Halons.	For new buildings, specify refrigeration and fire suppression systems that use no hydro-chlorofluorocarbons (HCFCs) or Halons.			Energy Credit 4; Ozone Protection ; 1 point available. Install base building level HVAC and refrigeration equipment and fire suppression systems that do not contain HCFCs or Halons.																																	


IOWA SUSTAINABLE DESIGN GUIDE GOALS AND SOLUTIONS MATRIX

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1 Encourage and recognize increasing levels of on-site renewable energy self-supply in order to reduce environmental impacts associated with fossil fuel energy use.	Assess the project for on-site non-polluting and renewable energy potential including solar, wind, geothermal, low-impact hydro, biomass, etc.		<p>1. Iowa Energy Center, Financial Incentives for Developing Renewable Energy Facilities in Iowa. Websites: http://www.energy.iastate.edu/renewable/incentives/ and http://www.energy.iastate.edu/news/downloads/Financial_Incentives.pdf</p> <p>2. Iowa Solar Calculator is a tool to determine the amount of solar energy available for your regional and local area. Website: http://www.energy.iastate.edu/renewable/solar/calculator/</p> <p>3. Iowa State University Center for Sustainable Energy Technologies. Website: http://www.ces.tamu.edu/</p>	<p>Energy Credit 2.1; Renewable Energy ; 1 point available. Supply at least 5% of the building's total energy use (as expressed as a fraction of annual energy cost) through the use of on-site renewable energy systems. Energy Credit 2.2;</p> <p>Renewable Energy; 1 point available. Supply at least 10% of the building's total energy use (as expressed as a fraction of annual energy cost) through the use of on-site renewable energy systems. Energy Credit 2.3:</p> <p>Renewable Energy; 1 point available. Supply at least 20% of the building's total energy use (as expressed as a fraction of annual energy cost) through the use of on-site renewable energy systems.</p>
41 Provide for the ongoing accountability and optimization of building energy and water consumption performance over time.	Model the energy and water systems to predict savings.		International Performance Measurement and Verification Protocol: Website: http://www.ipmvp.org/	<p>Energy Credit 5; Measurement and Verification ; 1 point available. Install continuous metering equipment for the following end-uses:</p> <ul style="list-style-type: none"> • Lighting systems and controls • Constant and variable motor loads • Variable frequency drive (VFD) operation • Chiller efficiency at variable loads (kW/ton) • Cooling load • Air and water economizer and heat recovery cycles • Air distribution static pressures and ventilation air volumes • Boiler efficiencies • Building-related process energy systems and equipment • Indoor water risers and outdoor irrigation systems <p>Develop a Measurement and Verification plan that incorporates the monitoring information from the above end-uses and is consistent with Option B, C or D of the 2001 International Performance Measurement & Verification Protocol (IPMVP) Volume I: Concepts and Options for Determining Energy and Water Savings.</p>
42 Encourage the development and use of grid-source, renewable energy technologies on a net zero pollution basis.	Sign a contract with renewable energy provider.		<p>1. Center for Resource Solutions (CRS) Green-e. Website: http://www.resource-solutions.org/ (LEED Reference).</p> <p>2. U.S. Environmental Protection Agency Green Power Partnership - Iowa. Website: http://www.epa.gov/greenpower/buyguide/ia.html</p>	<p>Energy Credit 6; Green Power ; 1 point available. Provide at least 50% of the building's electricity from renewable sources by engaging in at least a two-year renewable energy contract. Renewable sources are as defined by the Center for Resource Solutions (CRS) Green-e products certification requirements.</p>
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MATERIALS & RESOURCES 				
44	Facilitate the reduction of waste generated by building occupants that is hauled to and disposed of in landfills.		Iowa Recycling Association - http://www.earthweshare.org/orgsfolder/orgira.html	Prerequisite 1; Storage and Collection of Recyclables ; no credit. Provide an easily accessible area that serves the entire building and is dedicated to the separation, collection and storage of materials for recycling including (at a minimum) paper, corrugated cardboard, glass, plastics and metals.
45	Extend the 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.	Iowa State Historical Society Preservation Requirements. Website: http://www.iowahistory.org/index.html	1. Iowa Historic Preservation Alliance. Website: http://www.iowapreservation.org/awards/index.html 2. Iowa-based adaptive reuse case studies for community housing. Website: http://www.chihousing.com/chihousing/reuse/index.htm	Building Reuse; Credit 1.1 ; 1 point available. Maintain at least 75% of existing building structure and shell (exterior skin and framing, excluding window assemblies and non-structural roofing material). Building Reuse; Credit 1.2 ; 1 point available. Maintain an additional 25% (100% total) of existing building structure and shell (exterior skin and framing, excluding window assemblies and nonstructural roofing material). Building Reuse; Credit 1.3; 1 point available. Maintain 100% of existing building structure and shell (exterior skin and framing, excluding window assemblies and non-structural roofing material). AND at least 50% of non-shell areas (interior walls, doors, floor coverings and ceiling material).
46	Divert construction, demolition, and land clearing debris from landfill disposal. Redirect recyclable material back to the manufacturing process. Redirect reusable materials to appropriate sites.	Demolition Site Waste Legislative Task Force Report. Website: http://www.state.ia.us/dnr/organization/wmad/DemolitionSiteWasteLegislativeTaskForce.html	1. Iowa Department of Natural Resources Waste Reduction Assistance Program (WRAP). Website: http://www.state.ia.us/dnr/organization/wmad/wmabureau/pollution/wrap.html 2. Construction Waste Assessment: A Case Study of the South Central Iowa Solid Waste Agency Environmental Education Center. Website: http://www.sciswa.org/Waste%20study2.pdf 3. Iowa Department of Natural Resources list of Iowa Recycling Resources. Website: http://www.state.ia.us/dnr/organization/wmad/main/inside/recyclingdirectories/recyclingdirectory/construction.html 4. King County Washington, Designing Specifications and Waste Management Plans. Website: http://dnr.metrokc.gov/swd/bizprog/sus_build/a_plan.htm 5. University of Michigan publication discusses typical handling procedures, potential problems or barriers to the recovery process, and potential markets or end-uses for the most common debris generated by construction and demolition. Website: http://www.umich.edu/~nppcpub/resources/compendia/ARCHndfs/ARCHr&rAppBib.pdf	Construction Waste Management; Credit 2.1 ; 1 point available. Develop and implement a waste management plan, quantifying material diversion goals. Recycle and/or salvage at least 50% of construction, demolition and land clearing waste. Calculations can be done by weight or volume, but must be consistent throughout. Construction Waste Management; Credit 2.2; 1 point available. Develop and implement a waste management plan, quantifying material diversion goals. Recycle and/or salvage an additional 25% (75% total) of construction, demolition and land clearing waste. Calculations can be done by weight or volume, but must be consistent throughout.
47	Reuse building materials and products in order to reduce demand for virgin materials and to reduce waste, thereby reducing impacts associated with the extraction and processing of virgin resources.	Identify opportunities to incorporate salvaged materials into building design and research potential material suppliers. Consider salvaged materials such as beams, flooring, paneling, doors, frames, etc.	1. Iowa Waste Exchange. This program helps facilitate reuse and recycling activities among Iowa businesses and industries. Website: http://www.recycleiowa.org/exchange.html 2. The Habitat for Humanity ReStore provides an ongoing mechanism for diverting useable building materials from the waste stream by collecting and selling these materials to the general public. Website: http://www.restoreqc.org/text/about.htm	Resource Reuse; Credit 3.1 ; 1 point available. Use salvaged, refurbished or reused materials, products and furnishings for at least 5% of building materials. Resource Reuse; Credit 3.2; 1 points available. Use salvaged, refurbished or reused materials, products and furnishings for at least 10% of building materials.
48	Increase demand for building products that have incorporated recycled content materials, therefore reducing the impacts resulting from the extraction of new virgin materials.	Buy Recycled, Iowa! - http://www.recycleiowa.org/buyrecycled.html Iowa Recycled Products Database - http://216.81.223.68/dnrrecycle/BRPsearchinput.asp	1. U.S. Environmental Protection Agency Comprehensive Procurement Guidelines for recycled-content products. Website: http://www.epa.gov/cpg 2. Iowa Recycled Content Database search. Website: http://216.81.223.68/dnrrecycle/BRPsearchinput.asp 3. The California Integrated Waste Management Association's Recycled Content Product (RCP) Directory lists thousands of recycled products. Website: http://www.ciwmb.ca.gov/RCP/ . 4. The Bettendorf Family Museum of Arts and Science utilized numerous recycled-content products. Website: http://www.nrc-recycle.org/brba/casestudies/family.htm	Recycled Content; Credit 4.1 ; 1 point available. Use materials with recycled content such that post-consumer recycled content constitutes at least 5% of the total value of the materials in the project OR combined post-consumer and 1/2 post-industrial recycled content constitutes at least 10%. The value of the recycled content portion of a material or furnishing shall be determined by dividing the weight of recycled content in the item by the total weight of all material in the item, then multiplying the resulting percentage by the total value of the item. Mechanical and electrical components shall not be included in this calculation. Recycled content materials shall be defined in accordance with the Federal Trade Commission document, Guides for the Use of Environmental Marketing Claims, 16 CFR 260.7 (e), available at www.ftc.gov/bcp/grnrule/guides980427.htm . Recycled Content; Credit 4.2; 1 point available. Use materials with recycled content such that post-consumer recycled content constitutes at least 10% of the total value of the materials in the project OR combined post-consumer and 1/2 post-industrial recycled content constitutes at least 10% of the total value of the materials in the project.
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IOWA SUSTAINABLE DESIGN GUIDE GOALS AND SOLUTIONS MATRIX

A Goal	B Sample Solutions	C Iowa Code or Law (if applicable)	D Related Resources, Initiatives and/or Case Studies	E LEED Requirement
INDOOR ENVIRONMENTAL QUALITY 				
53 Establish minimum indoor air quality (IAQ) performance to prevent the development of indoor air quality problems in buildings, maintaining the health and well being of the occupants.			1. Iowa ASHRAE Chapter. Website: http://www.ashraeiowa.com/ 2. American Indoor Air Council, Iowa Chapter. Website: http://www.indoor-air-quality.org/Chapters/Iowa/IA.htm	Prerequisite 1; Minimum IAQ Performance ; no credit. Meet the minimum requirements of voluntary consensus standard ASHRAE 62-1999, Ventilation for Acceptable Indoor Air Quality, and approved Addenda (see ASHRAE 62-2001, Appendix H, for a complete compilation of Addenda) using the Ventilation Rate Procedure.
54 Prevent exposure of building occupants and systems to Environmental Tobacco Smoke.	Identify the building as a non-smoking building or properly ventilate any smoking areas.		1. Tobacco Free Iowa. Website: http://www.tobaccofreeiowa.org/secondhand_smoke_facts.shtml 2. Iowa Tobacco Research Center. Website: http://www.public-health.uiowa.edu/itrc/ 3. American Lung Association of Iowa-Illinois. Website: http://lungilia.org/reportcards.html 4. U.S. Environmental Protection Agency Health-Effects of Secondhand Smoke. Website: http://www.epa.gov/smokefree/healthrisks.html	Prerequisite 2; Environmental Tobacco Smoke Control; no credit. Zero exposure of non-smokers to ETS by EITHER: prohibiting smoking in the building and locating any exterior designated smoking areas away from entries and operable windows; OR providing a designated smoking room designed to effectively contain, capture and remove ETS from the building. At a minimum, the smoking room must be directly exhausted to the outdoors with no recirculation of ETS-containing air to the non-smoking area of the building, enclosed with impermeable deck-to-deck partitions and operated at a negative pressure compared with the surrounding spaces of at least 7 PA (0.03 inches of water gauge). Performance of the smoking rooms shall be verified by using tracer gas testing methods as described in the ASHRAE Standard 129-1997. Acceptable exposure in non-smoking areas is defined as less than 1% of the tracer gas concentration in the smoking room detectable in the adjoining non-smoking areas. Smoking room testing as described in ASHRAE Standard 129-1997 is required in the contract documents and critical smoking facility systems testing results must be included in the building commissioning plan and
55 Provide capacity for indoor air quality (IAQ) monitoring to sustain long term occupant comfort and well being.	Design HVAC system with carbon dioxide (CO ₂) monitoring sensors and integrate these sensors with the building automation system.			Carbon Dioxide Monitoring; Credit 1 ; 1 point available. Install a permanent carbon dioxide (CO ₂) monitoring system that provides feedback on space ventilation performance in a form that affords operational adjustments. Refer to the CO ₂ differential for all types of occupancy in accordance with ASHRAE 62-2001, Appendix D.
56 Provide for the effective delivery and mixing of fresh air to support the health, safety, and comfort of building occupants.	Consider operable windows.		Article in ASHRAE IAQ Magazine "IAQ Applications" - <i>Maximizing ventilation Effectiveness</i> . Website: http://ashrae.wvomer.com/iaqwinter2000.pdf	Ventilation Effectiveness; Credit 2 ; 1 point available. For mechanically ventilated buildings, design ventilation systems that result in an air change effectiveness (Eac) greater than or equal to 0.9 as determined by ASHRAE 129-1997. For naturally ventilated spaces demonstrate a distribution and laminar flow pattern that involves not less than 90% of the room or zone area in the direction of air flow for at least 95% of hours of occupancy.
57	Consider underfloor air systems.		Installation of an Underfloor Air Distribution system was installed in West Des Moines Area Community College West Campus. The flexible classrooms that have a 12-inch raised floor system. The project won an ASHRAE 2004 award. Website: http://www.ashrae.org/template/AssetDetail/assetid/30941	Ventilation Effectiveness; Credit 2 ; 1 point available.
58 Prevent indoor air quality problems resulting from the construction/renovation process in order help to sustain the comfort and well-being of construction workers and building occupants.	Sequence the installation of materials to avoid contamination of absorptive materials.		1. Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IA Guidelines for Occupied Buildings. Website: http://www.smacna.org (LEED Reference) 2. MERV value explanation. Website: http://www.foustco.com/docs/merv_explanation.pdf	Construction IAQ Management Plan - During Construction; Credit 3.1 ; 1 point available. Develop and implement an Indoor Air Quality (IAQ) Management Plan for the construction and pre-occupancy phases of the building as follows: 1 - During construction meet or exceed the recommended Design Approaches of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guideline for Occupied Buildings under Construction, 1995, Chapter 3. 2 - Protect stored on-site or installed absorptive materials from moisture damage. 3 - If air handlers must be used during construction, filtration media with a Minimum Efficiency Reporting Value (MERV) of 8 must be used at each return air grill, as determined by ASHRAE 52.2-1999. 4 - Replace all filtration media immediately prior to occupancy. Filtration media shall have a Minimum Efficiency Reporting Value (MERV) of 13, as determined by ASHRAE 52.2-1999 for media installed at the end of construction.
59 60	Prior to occupancy, perform a two week building flush out or test the contaminant levels in the building.			Construction IAQ Management Plan - Before Occupancy; Credit 3.2 ; 1 point available. Develop and implement an Indoor Air Quality (IAQ) Management Plan for the pre-occupancy phase as follows: After construction ends and prior to occupancy conduct a minimum two-week building flush-out with new Minimum Efficiency Reporting Value (MERV) 13 filtration media at 100% outside air. After the flushout, replace the filtration media with new MERV 13 filtration media, except the filters solely processing outside air. OR Conduct a baseline indoor air quality testing procedure consistent with the United States Environmental Protection Agency's current Protocol for Environmental Requirements, Baseline IAQ and Materials, for the Research Triangle Park Campus, Section 01445.

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61	Reduce the quantity of indoor air contaminants that are odorous, potentially irritating and/or harmful to the comfort and well-being of installers and occupants.	Specify low volatile organic (VOC) adhesives and sealants.		1. South Coast Air Quality Management District. Website: www.aqmd.gov (LEED Reference) 2. U.S. Environmental Protection Agency "Sick Building Syndrome" Fact Sheet - http://www.epa.gov/iaq/pubs/sbs.html	Low-Emitting Materials; Credit 4.1 ; 1 point available. Reduce the quantity of indoor air contaminants that are odorous, potentially irritating and/or harmful to the comfort and well-being of installers and occupants. The VOC content of adhesives and sealants used must be less than the current VOC content limits of South Coast Air Quality Management District (SCAQMD) Rule #1168, AND all sealants used as fillers must meet or exceed the requirements of the Bay Area Air Quality Management District Regulation 8, Rule 51.
62		Specify low volatile organic (VOC) paints.		The Green Seal is awarded to products that have less impact on the environment and work well. Green Seal report GS-11 addresses paints. Website: http://www.greenseal.org/standards/paints.htm	Low-Emitting Materials; Credit 4.2 ; 1 point available. VOC emissions from paints and coatings must not exceed the VOC and chemical component limits of Green Seal's Standard GS-11 requirements.
63		Specify low volatile organic (VOC) carpet.		Carpet and Rug Institute. Website: www.carpet-rug.com (LEED Reference)	Low-Emitting Materials; Credit 4.3 ; 1 point available. Carpet systems must meet or exceed the requirements of the Carpet and Rug Institute's Green Label Indoor Air Quality Test Program.
64		Specify low volatile organic (VOC) composite wood products.			Low-Emitting Materials; Credit 4.4 ; 1 point available. Composite wood and agrifiber products must contain no added urea-formaldehyde resins.
65	Avoid exposure of building occupants to potentially hazardous chemicals that adversely impact air quality.	Design a separate exhaust & plumbing systems for rooms where chemical mixing occurs.		Environmental Protection Agency Region 7 Resource "Discharges to Sanitary Drains" - http://www.epa.gov/Region7/education_resources/teachers/ehsstudy/ehs20.htm	Indoor Chemical & Pollutant Source Control; Credit 5 ; 1 point available. Design to minimize pollutant cross-contamination of regularly occupied areas: • Employ permanent entryway systems (grills, grates, etc.) to capture dirt, particulates, etc. from entering the building at all high volume entryways. • Where chemical use occurs (including housekeeping areas and copying/ printing rooms), provide segregated areas with deck to deck partitions with separate outside exhaust at a rate of at least 0.50 cubic feet per minute per square foot, no air re-circulation and maintaining a negative pressure of at least 7 PA (0.03 inches of water gauge). • Provide drains plumbed for appropriate disposal of liquid waste in spaces where water and chemical concentrate mixing occurs.
66		Employ permanent entryway systems.			Indoor Chemical & Pollutant Source Control; Credit 5 ; 1 point available.
67	Provide a high level of thermal, ventilation, and lighting systems control by individual occupants or specific groups in multi-occupant spaces to promote the productivity, comfort and well being of building occupants.	Install operable windows.		The Iowa State University - Palmer HDFS Building in Ames, IA was designed with operable windows. Website: http://www.designshare.com/Awards2001/ReviewProjectOverview.asp?project_id=108&ProjType=COL	Controllability of Systems; Credit 6.1 ; 1 point available. Provide at least an average of one operable window and one lighting control zone per 200 square feet for all regularly occupied areas within 15 feet of the perimeter wall.
68		Provide occupant control of lighting, especially task lighting.	Refer to the Iowa State Building Energy Code pages 96-99.		Controllability of Systems; Credit 6.1; 1 point available.
69		Consider and underfloor air distribution system.		<u>Installation of an Underfloor Air Distribution system was installed in West Des Moines Area Community College West Campus. The flexible classrooms that have a 12-inch raised floor system. The project won an ASHRAE 2004 award. Website: http://www.ashrae.org/template/AssetDetail/assetid/30941</u>	Controllability of Systems; Credit 6.2 ; 1 point available. Provide controls for each individual for airflow, temperature and lighting for at least 50% of the occupants in non-perimeter, regularly occupied areas.
70	Provide for a thermally comfortable environment that supports the productivity and well being of building occupants.	Design the mechanical system to maintain humidity and temperature within well-defined ranges.			Thermal Comfort; Credit 7.1 ; 1 point available. Comply with ASHRAE Standard 55-1992, Addenda 1995, for thermal comfort standards including humidity control within established ranges per climate zone. For naturally ventilated buildings, utilize the adaptive comfort temperature boundaries, using the 90% acceptability limits as defined in the California High Performance Schools (CHPS) Best Practices Manual, Appendix C – A Field Based Thermal Comfort Standard for Naturally Ventilated Buildings, Figure 2.
71		Provide a humidification system that provides feedback to the operate.			Thermal Comfort; Credit 7.2 ; 1 point available. Install a permanent temperature and humidity monitoring system configured to provide operators control over thermal comfort performance and the effectiveness of humidification and/or dehumidification systems in the building.
72	Provide for the building occupants a connection between indoor spaces and outdoor environments through the introduction of sunlight and views into the occupied areas of the building.	Consider building orientation, shallow floor plates, increased building perimeter, exterior and interior permanent shading devices, high performance glazing to optimize use of natural light while considering heat gain.		<u>1. Efficient Windows Collaborative publication "Selecting Energy Efficient Windows in Iowa". Website: http://www.efficientwindows.org/factsheets/iowa.pdf</u>	Daylight and Views; Credit 8.1 ; 1 point available. Achieve a minimum Daylight Factor of 2% (excluding all direct sunlight penetration) in 75% of all space occupied for critical visual tasks. Spaces excluded from this requirement include copy rooms, storage areas, mechanical plant rooms, laundry and other low occupancy support areas. Other exceptions for spaces where tasks would be hindered by the use of daylight will be considered on their merits.

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73				2. The Day lighting Collaborative brings together utilities, product manufacturers, state agencies, design and construction professionals, and other organizations dedicated to promoting the human, environmental and economic benefits of the daylighting approach to building design. Website: http://www.daylighting.org/	
74				3. At the Iowa Association of Municipal Utilities building, orientation and window design was partially responsible for a design which uses over 50% less energy than a code compliant office building. Website: http://www.theweidgroupenergy.com/Analysis/IowaAssoc.htm	
75		Consider having the artificial lighting interact with the natural light in the space.			Daylight and Views; Credit 8.1; 1 point available.
76		Utilize modeling techniques to optimize the use of natural light.			Daylight and Views; Credit 8.1; 1 point available.
77		Maximize view opportunities for occupants.			Daylight and Views; Credit 8.2 ; 1 point available. Achieve direct line of sight to vision glazing for building occupants in 90% of all regularly occupied spaces. Examples of exceptions include copy rooms, storage areas, mechanical, laundry and other low occupancy support areas. Other exceptions will be considered on their merits.
78	Provide for an indoor environment that has quality acoustics.	Consider design solutions that go above and beyond minimum acoustic requirements.			N/A

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INNOVATION & DESIGN PROCESS				
79 To provide design teams and projects the opportunity to be awarded points for exceptional performance above requirements set by the LEED Green Building Rating System and/or innovative performance in Green Building categories not specifically addressed by the LEED Green Building Rating System.	Apply strategies or measures that are not covered by LEED such as acoustic performance, education of occupants, etc.	N/A	Refer to projects that have achieved Innovation points. All innovation points can be achieved on more than one project. Website: www.usgbc.org	Innovation in Design; Credit 1.1 - 1.4 ; 4 points available. In writing, identify the INTENT of the proposed innovation credit, the proposed REQUIREMENT for compliance, the proposed SUBMITTALS to demonstrate compliance, and the DESIGN APPROACH (strategies) used to meet the requirements.
80 To support and encourage the design integration required by a LEED Green Building project and to streamline the application and certification process.		N/A		LEED Accredited Professional; Credit 2 ; 1 point available. At least one principal participant of the project team has successfully completed the LEED Accredited Professional Exam.
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Sustainable Goals and Solutions

Related Resources

Contacts	Description	Contact Information
<p>Sustainable Building Technical Manual</p>	<p>This manual helps designers, builders, owners, and operators of public and private facilities implement green strategies. This manual offers step-by-step guidelines for energy-efficient and resource-efficient building during predesign, design, construction, operations, and management. It also includes chapters on sustainable building economics and future issues and trends.</p>	<p>Website: http://www.usgbc.org/Resources/SBTM.asp</p>
<p>Green Building Advisor (GBA)</p>	<p>GBA is a software program designed to help architects and other building professionals design occupant-friendly and environmentally friendly buildings. The software presents hundreds of sustainable solutions and related resources. The program allows the user to search information, or enter project data to look for project specific solutions.</p>	<p>Website: http://www.greenbuildingadvisor.com</p>

Economics of Sustainable Design

Related Resources (continued)

Contacts	Description	Contact Information
Whole Building Design Guide	The Whole Building Design Guide is a web site developed and supported by federal agencies. The site contains a wealth of information on sustainable design including in-depth information on specific sustainable solutions. It contains numerous resources related to other federal goals such as security, accessibility, and affordability.	Website: http://www.wbdg.org/ (Select Design Guidance, then Design Objectives to reach the sustainable design information.)