



Iowa Green Streets Criteria



Version 3.0

For Downtown Revitalization Projects

www.iowaeconomicdevelopment.com

Contents

Overview	4
How to Use This Document.....	4
Activities and Projects Covered by the Iowa Green Streets Criteria.....	5
Additional Requirements	5
Optional Points.....	5
Other Resources	6
Section 1: Integrated Design	11
Green Development Plan: Integrative Design Meeting(s)	11
Green Development Plan: Criteria Documentation	12
Applicant/Recipient, Architect/Project Designer and/or Contractor Certification.....	13
Accessibility: Rehabilitation	13
Section 2: Site, Location and Neighborhood Fabric	15
Downtown Design Standards/Guidelines	15
Passive Solar Heating/Cooling.....	15
Grayfield or Brownfield.....	16
Adaptive Reuse Site.....	17
Previous Historic Efforts.....	17
Historic District Listing.....	17
Individual Building Listings	18
Section 3: Site Improvements	19
Erosion and Sedimentation Control.....	19
Surface Water Management	19
Section 4: Water Conservation	20
Water Reuse	20
Section 5: Energy Efficiency	21
Efficient Lighting: Exterior	21
Section 6: Materials Beneficial to the Environment	22
Construction Waste Management	22
Construction Waste Management: Additional Diversion.....	22
Durable and Low Maintenance Exteriors	23
Recycled Content Material	23
Certified, Salvaged and Engineered Wood Products	24
Reducing Heat-Island Effect – Roofing	24
Section 7: Healthy Living Environment	26
Low / No VOC Paints and Primers	26
Low / No VOC Adhesives and Sealants.....	26
Composite Wood Products that Emit Low / No Formaldehyde.....	27
Lead Paint & Asbestos Abatement.....	28
Ventilation: Rehabilitation.....	29
Basements and Concrete Slabs – Vapor Barrier.....	30
Water Drainage.....	31
Integrated Pest Management.....	32
Smoke-free Building.....	32
Section 8: Operations and Maintenance	33
Building Maintenance Manual	33

Occupant Manual	33
Tenant Orientation	34
Project Data Collection and Monitoring System	34
Appendix A	36
Appendix B	38
Appendix C	39
Appendix D	41
Appendix E.....	42

Overview

The Iowa Green Streets Criteria promote public health, energy efficiency, water conservation, smart locations, operational savings, and sustainable building practices. These Iowa Green Streets Criteria apply directly to Community Development Block Grant Downtown Revitalization Façade Master Plan Projects. As a result, the strategies in the following pages enhance community facilities, town centers, and communities as a whole.

In addition to increasing resource efficiency and reducing environmental impacts, green building strategies can yield cost savings through long-term reduction in operating expenses. The benefits include improved energy performance and comfort, a healthier indoor environment, increased durability of building components, and simplified maintenance requirements that can lead to financial efficiencies for property managers and owners. Green building practices improve the economics of managing community facilities and downtown businesses while enhancing quality of life for residents, visitors, and employees. When green building practices inform the design of our buildings – utilizing community facilities and businesses near community amenities such as public transportation to create walkable, livable neighborhoods – the benefits for citizens and communities expand.

Guiding principles behind the Iowa Green Streets Criteria ensure that buildings must be cost effective to build, and durable and practical to maintain. In addition, the principles work together to help produce green buildings that:

- ▶ Result in a high-quality, healthy living and working environment
- ▶ Lower utility costs
- ▶ Enhance connections to nature
- ▶ Protect the environment by conserving energy, water, materials and other resources
- ▶ Advance the health of local and regional ecosystems

How to Use This Document

The Iowa Green Streets Criteria is based on the national Green Communities Criteria available online at <http://www.enterprisecommunity.com/solutions-and-innovation/enterprise-green-communities/criteria>. The Iowa Economic Development Authority thanks Enterprise and its partners for development of the national Green Communities Criteria and the use of those criteria in development of the Iowa Green Streets Criteria.

Please be aware that this Iowa Green Streets Criteria document is subject to periodic revision and update. Refer to the Iowa Economic Development Authority's Community Development Division Web site, <http://www.iowaeconomicdevelopment.com/CommunityDevelopment/green> for the most current version.

(Note: The criteria referenced in this document are based on the national Green Communities Criteria as of February 2011. Any revisions to the national Green Communities Criteria will not apply to Iowa Economic Development Authority projects unless adopted by the Iowa Economic Development Authority and specifically addressed in the Iowa Green Streets Criteria.)

Activities and Projects Covered by the Iowa Green Streets Criteria

The Iowa Green Streets Criteria include mandatory and optional components in the criteria for the following types of activities or projects.

- Community Development Block Grant Program projects, including disaster recovery projects

¹ Gut Rehabilitation – Gut rehabilitation is defined as an activity or project that involves extensive (substantial) rehabilitation in terms of total removal and replacement of all interior (non-structural) systems, equipment, components or features of the existing structure to be rehabilitated or converted, whereby the existing structure will be reduced (as part of the rehabilitation or conversion of the structure) down to the basic structure or exterior building shell (e.g., the foundation system; exterior walls; roofs; and interior structural components such as columns, beams, floors and structural bearing walls). Gut rehabilitation may also include structural and non-structural modifications to the exterior of the structure.

² Rehabilitation – Rehabilitation is defined as a project designed to retain some of the fixtures and finishes including existing walls, trim, doors, etc., and completing upgrades or modifications that are less extensive than the gut rehabilitation definition above. Rehabilitation is often used when historic fixtures and finishes are present and need to be retained while updating the space for future use.

Additional Requirements

In addition to the Iowa Green Streets Criteria, the following requirements, as applicable, apply to all activities and projects covered by the Iowa Green Streets Criteria.

- ▶ All newly constructed projects or activities, including Community Development Block Grant Projects, shall be professionally designed, complete with a detailed set of construction plans and specifications that incorporate all applicable requirements of the Iowa Green Streets Criteria.
- ▶ All new construction including IEDA's Community Development Block Grant funds are subject to the requirements of the International Energy Conservation Code (the most current version as adopted by the State Building Code).
- ▶ All rehabilitation activities or projects must meet the requirements of any and all locally adopted and enforced building codes, standards, and ordinances. In the absence of locally adopted and enforced building codes, the building code requirements of the State Building Code shall apply.
- ▶ Applicants must provide evidence of site control with their application (proposed lease, warranty deed, purchase agreement option).

Optional Points

A significant number of optional criteria are also included in the green criteria for increasing the overall sustainability and energy performance of buildings.

Depending on the program, the optional criteria account for up to approximately ten percent of the total project "score" during the application review and selection processes of the Iowa Economic Development Authority Community Development Block Grant Program.

Applications achieving the following ranges of optional criteria points will be considered to achieve a low, moderate, or high level of additional green performance during application review and selection.

Optional Green Criteria Point Range	Level of Additional Green Performance
2 – 15 points	Low
16 - 70 points	Moderate
71 - 254 points	High

Other Resources

Here are some additional resources to assist you with your green project:

- ▶ American Institute of Architects, Iowa Chapter – www.aiaiowa.org
- ▶ Building Green, LLC/Environmental Building News - www.buildinggreen.com/
- ▶ Center on Sustainable Communities - www.icosc.com/
- ▶ Energy Star - www.energystar.gov
- ▶ Green Communities - <http://www.greencommunitiesonline.org/tools/resources/>
- ▶ Green Home Guide - www.greenhomeguide.org/
- ▶ Iowa Department of Cultural Affairs – www.culturalaffairs.org
- ▶ Iowa Department of Public Health – www.idph.state.ia.us
- ▶ Iowa Energy Center - www.energy.iastate.edu/
- ▶ Iowa State University Extension - www.extension.iastate.edu/
- ▶ National Association of Homebuilders Model Green Home Building Guidelines - <http://www.nahb.org/generic.aspx?genericContentID=194088>
- ▶ Partnership for Advanced Technologies in Housing - www.pathnet.org/
- ▶ U.S. Green Building Council - www.usgbc.org/
- ▶ University of Minnesota Center for Sustainable Building Research - www.csbr.umn.edu/index.html
- ▶ University of Washington Universal Design of Instruction - <http://www.washington.edu/doit/Brochures/Academics/instruction.html>

For even more resources, visit the Iowa Economic Development Authority's Community Development Division web site www.iowaeconomicdevelopment.com/CommunityDevelopment/green

For additional information about the Iowa Green Streets Criteria, please call:

515-725-3069

Visit the website:

<http://iowaeconomicdevelopment.com/CommunityDevelopment/green>

Section 1: Integrated Design

An integrated design process incorporates sustainability up-front, uses a holistic and total-systems approach to the development process, and promotes good health and livability through the building's life cycle. The goal is to establish a written commitment that informs the project's objectives through the building's life cycle.

Sustainable building strategies should be considered from the moment the developer initiates the project. The professional development team should include a developer, architect, engineer, landscape architect, LEED™ Accredited Professional or experienced green building design specialist, contractor, and asset and property management staff. Whenever possible, the team also should include maintenance staff and occupant representatives. The team must be committed to environmentally responsive, resource conserving and healthy building principles and practices.

Section 2: Neighborhood Fabric

Investigate existing neighborhood fabric to determine extent of previous design and environmental aspects. Restoring what has been lost or improving upon what exists, along with redevelopment or reuse of existing structures and passive solar heating and cooling, is the most sustainable option available. Downtown design standards keep downtowns cohesively designed and planned. Look for a comprehensive plan that aligns historic preservation, sustainability, and existing fabric together.

Section 3: Site Improvements

Sustainable design and site planning integrate design and construction strategies to: minimize environmental site impacts; enhance human health; reduce construction costs; maximize energy, water, and natural resource conservation; and improve operational efficiencies.

Section 4: Water Conservation

Water efficiency conserves finite fresh water resources and reduces utility bills. Significant water savings can be realized by taking advantage of rainwater catchment and gray-water sources.

Section 5: Energy Efficiency

Energy efficiency helps to maximize occupant comfort and health, and reduces utility bills. Conservation measures mitigate the accumulative burdens of energy production and delivery, extraction of nonrenewable natural resources, degradation of air quality, global warming, and the increasing concentration of pollutants.

Section 6: Materials Beneficial to the Environment

Reducing, reusing and recycling building materials conserves natural resources and reduces emissions associated with manufacturing and transporting raw materials. Many techniques and building products on the market contribute to more durable, healthy, and resource-efficient buildings.

Section 7: Healthy Living Environment

The importance of a healthy living environment is a significant green building issue directly affecting occupants. Creating a healthy living environment involves the use of materials that do not cause negative health impacts for workers, especially for more sensitive groups such as children, seniors, and individuals with existing respiratory problems and compromised immune systems.

Section 8: Operations and Maintenance

Operations and maintenance (O&M) practices impact the building owner's costs and residents' health, comfort and safety. Sustainable building O&M practices enhance resident health and operational savings. The key to successful building performance is the integration of O&M plans, education and cost-effective, low-maintenance design.

Iowa Green Streets Checklist

Overall Project

Section 1: Integrated Design Process

Y	N	Item #	Item Title	Points
		1.1a	Green Development Plan: Integrative Design Meeting(s)	Mandatory
		1.1b	Green Development Plan: Criteria Documentation	Mandatory
		1.2	Applicant/Recipient, Architect/Project Designer, and/or Contractor Certification	Mandatory
		1.3	Accessibility: Rehabilitation	5 / building

Section 2: Neighborhood Fabric

Y	N	Item #	Item Title	Points
		2.1	Downtown Design Standards	5
		2.2	Passive Solar Heating/Cooling	4
		2.3a	Grayfield or Brownfield Redevelopment	15
		2.3b	Adaptive Reuse Site	12
		2.4	Previous Historic Efforts	12
		2.5	Historic District Listing	30
		2.6	Individual Listings	5 / building

Section 3: Site Improvements

Y	N	Item #	Item Title	Points
		3.1	Erosion and Sedimentation Control	Mandatory
		3.2	Surface Water Management	Mandatory

Building Specific

Section 4: Water Conservation

Y	N	Item #	Item Title	Points
		4.1	Water Reuse	Up to 10

Section 5: Energy Efficiency

Y	N	Item #	Item Title	Points
		5.1	Efficient Lighting – Exterior	Mandatory

Section 6: Materials Beneficial to the Environment

Y	N	Item #	Item Title	Points
		6.1a	Construction Waste Management	Mandatory
		6.1b	Construction Waste Management: Additional Diversion	Up to 15
		6.2	Durable & Low Maintenance Exteriors	Mandatory

		6.3	Recycled Content Material	Up to 10
		6.4	Certified, Salvaged and Engineered Wood	5
		6.5	Reduce Heat-Island Effect – Roofing	5

Section 7: Healthy Living Environment

Y	N	Item #	Item Title	Points
		7.1	Low/No VOC Paints & Primers	Mandatory
		7.2	Low/No VOC Adhesives & Sealants	Mandatory
		7.3	Composite Wood Products that Emit Low / No Formaldehyde	Mandatory
		7.4	Lead Paint and Asbestos Abatement	Mandatory
		7.5	Ventilation: Rehabilitation	10
		7.6	Basements & Concrete Slabs – Vapor Barrier	Mandatory
		7.7	Water Drainage	Mandatory
		7.8	Integrated Pest Management	Mandatory
		7.9	Smoke-Free Building	2

Section 8: Operations and Maintenance

Y	N	Item #	Item Title	Points
		8.1	Building Maintenance Manual	Mandatory
		8.2	Occupant Manual	Mandatory
		8.3	Tenant Orientation	Mandatory
		8.4	Project Data Collection and Monitoring System	35

Section 1: Integrated Design

1-1a	Green Development Plan: Integrative Design Meeting(s)
	MANDATORY

How

Conduct one or more integrative design meeting(s) as appropriate for your project and submit a completed Green Development Plan from Appendix A or equivalent documentation that outlines the integrative design approach used for this development that demonstrates involvement of the entire project team throughout the design and development process.

Intent

An integrative design process facilitates the design and development team's achievement of green objectives throughout the project life cycle. The outcomes of an integrative design process can include substantially lower development costs and greater health, economic, and environmental benefits for residents, property owners, and communities.

Recommendations

- ▶ Conduct a green design charette with the full development team, including participants from the following disciplines or interests:
 - Prospective or current building occupants
 - Architecture or commercial building design
 - Mechanical or energy engineering
 - Building science or performance testing
 - Green building or sustainable design
 - Building management and maintenance
 - Environmental science

- ▶ Best practices in documenting the integrative design charette will help the project applicant in completing the Iowa Green Streets Criteria required Green Development Plan including:
 - A roster of the name and role of each member of the professional design and development team
 - A statement of the overall green development goals of the project and the expected intended outcomes from addressing those goals
 - A summary of the process that was used to select the green building strategies, systems, and materials that will be incorporated into the project
 - A description of how each of the mandatory and optional items will be included in the project
 - Identification of which members of the design and development team are responsible for implementing the green features
 - A description of follow-up measures to be taken through the completion of design, permitting, construction, and operation to ensure that the green features are included and correctly installed, and that the owners or tenants receive information about the function and operation of the features
 - Meeting minutes or other documentation that captures and summarizes components of the integrative design process

- ▶ Project performance and durability can be dramatically affected by decisions and processes established during the integrative design phase. Advanced Energy developed the following list of recommendations for project teams to consider during integrative design, based on an evaluation of Enterprise Green Communities projects:
 - Consider adding specific energy consumption thresholds or goals for each project that will be evaluated after project completion.

- Document your process for approaching and complying with the Criteria for use in your future green projects. Include specific options for complying with Criteria, contact information for useful resources (organizations, websites, product distributors, etc.), and lessons learned.
- Adjust the scopes of all of the projects in your portfolio to match the Criteria in order to avoid confusion with changing expectations.
- Consider creating incentives for your construction team based on the performance of various building components.

1-1b	Green Development Plan: Criteria Documentation
	MANDATORY

How

Create design and construction documentation (e.g., plans, details, specifications) to include information on implementation of appropriate Iowa Green Streets Criteria. The project architect/designer must initial and sign the project plan and spec book checklist in Appendix C of the Iowa Green Streets Criteria prior to issuing construction documents for bidding.

Intent

Projects that explicitly address accountability among project team members and implementation details for the Iowa Green Streets Criteria in design and construction documentation are better positioned to successfully implement the Criteria on site during the construction phase.

Recommendations

Use the Project Plan and Spec Book Checklist below to assist the project to incorporate all Iowa Green Streets Criteria mandatory and optional measures that the project intends to meet as indicated in the Green Development Plan.

= mandatory

Project Plan and Spec Book Checklist

CRITERION	PROJEC T PLANS	SPEC BOOK	ARCHITECT INITIALS
1.1a-b Green Development Plan			
1.2 Applicant/Recipient, Architect/Project Designer, and/or Contractor Certification			
1.3 Accessibility	X	X	
2.1 Downtown Design Standards			
2.2 Passive Solar Heating/Cooling	X		
2.3a-b Site Reuse	X		
2.4 Previous Historic Efforts			
2.5 Historic District Listing			
2.6 Individual Listings			
3.1 Erosion and Sedimentation Control	X	X	
3.2 Surface Water Management	X	X	
4.1 Water Reuse	X	X	
5.1 Efficient Lighting		X	
6.1a-b Construction Waste Management		X	
6.2 Durable and Low-Maintenance Exteriors	X	X	
6.3 Recycled Content Material		X	
6.4 Certified, Salvaged, and Engineered Wood Products		X	

6.5 Reducing Heat Island Effect		X	
7.1 Low/No VOC Paints and Primers		X	
7.2 Low/No VOC Adhesives and Sealants		X	
7.3 Composite Wood Products that Emit Low/No Formaldehyde		X	
7.4 Environmental Remediation	X	X	
7.5 Ventilation: Rehabilitation	X	X	
7.6 Basements and Concrete Slabs: Vapor Barrier	X	X	
7.7 Water Drainage	X	X	
7.8 Integrated Pest Management	X	X	
7.9 Smoke Free Building		X	
8.1 Maintenance Manual			
8.2 Occupant Manual			
8.3 Tenant Orientation			
8.4 Project Data Collection and Monitoring System			

1-2	Applicant/Recipient, Architect/Project Designer and/or Contractor Certification
	MANDATORY

How

The Architect/Project Designer, General Contractor, HVAC Contractor, and/or Applicant/Recipient are required to certify in writing at various stages of the development process their intention to comply, and actual compliance with all of the MANDATORY Iowa Green Streets Criteria, as follows:

- ▶ Certification of Intent to Comply at time of initial application – signed by Applicant and the Architect/Project designer. See *Appendix B for certification form.*
- ▶ Certification of Construction Contract Document Compliance prior to construction commencement signed by Recipient and Architect/Project Designer. See *Appendix C for certification form.*
- ▶ Certification of Compliance at end of construction – signed by Recipient, Architect/Project Designer, General Contractor and HVAC Contractor. See *Appendix D for certification form.*
- ▶ Energy Performance Certification (as applicable) – signed by HERS rater or energy professional, Recipient and Architect/Project Designer. See *Appendix E for certification form.*
- ▶ Energy Performance Certification: Rehabilitation (as applicable) – signed by HERS rater or energy professional, Recipient and Architect/Project Designer. See *Appendix F for certification form.*

1-3	Accessibility: Rehabilitation
	OPTIONAL (5 / Building)

How

Design, when able, entrances to be ADA accessible.

Intent

Universal design features result in a building that is sensitive to a wide range of resident needs, including those who have temporary or permanent disabilities. The creation of comfortable environments for a diverse population increases the likelihood

of dynamic, diverse communities. Universal design means the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design. Universal Design has seven principles:

1. Equitable use. The design is useful and marketable to people with diverse abilities.
2. Flexibility in use. The design accommodates a wide range of individual preferences and abilities.
3. Simple and intuitive use. Use of the design is easy to understand, regardless of user's experience, knowledge, language skills, or current concentration level.
4. Perceptible information. The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.
5. Tolerance for error. The design minimizes hazards and the adverse consequences of accidental or unintended actions.
6. Low physical effort. The design can be used efficiently, comfortable, and with minimum of fatigue.
7. Size and space for approach and use. Appropriate size and space is provided for approach, reach, manipulation, and use regardless of the user's body size, posture, or mobility.

Recommendations

Universal design features should be considered during the integrative design process, based on the sustainability goals of the project.

Section 2: Site, Location and Neighborhood Fabric

2-1	Downtown Design Standards/Guidelines
	OPTIONAL (15 points)

How

Providing a copy of design standards or guidelines as applied to downtown historic commercial district.

Intent

Communities with design standards or guidelines have more cohesive looking downtowns. The growth of that community is done within an overall plan of development.

2-2	Passive Solar Heating/Cooling
	OPTIONAL (4 Points)

How

Demonstrate a project with a passive solar design, orientation, and shading that meets the following guidelines. Documentation must include sun angles and a wall section showing compliance with the guidelines and a site plan indicating true north.

Project Type	Potential Points	Requirements
Rehabilitation	2	All new windows must comply with the window guidelines. If building is historic, window repair or replacement must follow the Secretary of Interior's Standards.
	2	All south-facing elevations must comply with shading guidelines

Guidelines

1. Glazing

The glazing area on the south-facing façade should be 30% greater than the sum of the glazing areas on the east-, west-, and north-facing façades.

2. Glazing type

Provide windows with U-values of 0.25 and a minimum solar heat gain coefficient (SHGC) of 0.50 by orientation.

3. Shading

For south-facing windows, at least 50% of the window needs to be shaded by June 21.

Intent

The utilization of passive solar energy through design minimizes reliance on mechanical heating, lowers the cooling load, and provides more residents with access to daylight.

Recommendations

- ▶ Interior spaces requiring the most lighting, heating, and cooling should be along the south face of the building.
- ▶ A narrow floor plate (less than 40 feet), single-loaded corridors, and an open floor plan optimize daylight and natural ventilation.
- ▶ Thermal Massing
 - Locate a material with high thermal mass on the southern portion of the house where sunlight hits during the heating season.
 - Materials with thermal mass include brick, concrete, stone, water, and any other material of a similar high density and specific heat capacity.
 - The thermal mass location must be shown in the schematic wall section of the southern façades.
- ▶ Additional Potential Passive Cooling Strategies
 - Plant deciduous shade trees on the south façades.
 - Maximize cross ventilation by installing operable windows at the leeward and windward sides of the building.

2-3a	Grayfield or Brownfield
	OPTIONAL (15 Points)

How

One or more buildings in the project are located on a grayfield or brownfield.

Intent

Use of previously developed sites, including those where development is complicated by real or perceived environmental contamination or physical constraints, reduces pressure on undeveloped land and the spread of pavement to new watersheds. Many such sites are otherwise prime locations for redevelopment and provide potential economic and location benefits to citizens, neighborhoods and communities. Reuse of existing structures reduces the need for new materials and utilizes embodied energy.

Definitions

- ▶ Grayfields are previously developed abandoned sites, such as parking lots, obsolete shopping centers, and dilapidated residential structures scheduled to be deconstructed or demolished.
- ▶ Brownfields require a Phase II Environmental Site Assessment and remediation plan.

2-3b	Adaptive Reuse Site
	OPTIONAL (12 Points)

How

Reuse of an existing building with new services.

Intent

Reusing existing buildings and infrastructure is a sustainable community best practice.

Definitions

- ▶ Adaptive reuse means more fully utilizing an existing building that is currently vacant or underutilized.

2-4	Previous Historic Efforts
	OPTIONAL (12 Points)

How

Provide completed Iowa Site Inventory Forms, Reconnaissance or Intensive Level Surveys, historic photographs and images to show that the applicant has completed previous historic documentation efforts.

Intent

More information collected about historic resources helps drive correct design, so that architects are not over- or under-designing for buildings. Having some historic documentation completed for each building prior to initiating design will help define what the significant features of the building are that should be retained and what may be removed or altered without adversely affecting a historic structure. This information will also be helpful in successfully completing the Section 106 of the National Historic Preservation Act consultation process, which is required for all CDBG funded projects.

2-5	Historic District Listing
	OPTIONAL (30 Points)

How

Provide documentation that the area being proposed for the Downtown Revitalization Project has been surveyed for historic resources and a historic district containing some or all of the project area has been listed in the National Register of Historic Places (NRHP).

Intent

Resources that are listed on the NRHP or have been determined eligible for listing in the NRHP within the past five (5) years will have a substantial amount of documentation and research already completed. This will assist in correct design development and will expedite the Section 106 review process, assuming that designs are developed in conformance with the Secretary of the Interior’s Standards.

The existence of a NRHP listed district demonstrates community commitment to preserving historic resources.

Definitions

National Register of Historic Places: The National Register of Historic Places is the official list of the Nation's historic places worthy of preservation. Authorized by the National Historic Preservation Act of 1966, the National Park Service's National Register of Historic Places is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect America’s historic and archeological resources.

.2-6	Individual Building Listings
	OPTIONAL (5 per building)

How

Provide documentation that the building(s) included in the project area is listed on the National Register of Historic Places (NRHP) or been determined eligible for listing in the NRHP through consultation with the SHPO.

Intent

Resources that are listed on the NRHP or have been determined eligible for listing in the NRHP within the past five (5) years, will have a substantial amount of documentation and research already completed, which will assist in correct design development and will expedite the Section 106 review process, assuming that designs are developed in conformance with the Secretary of the Interior’s Standards.

Section 3: Site Improvements

3-1	Erosion and Sedimentation Control
	MANDATORY (for projects disturbing ground)

How

For projects disturbing less than one acre, implement EPA's Best Management Practices for erosion and sedimentation control during construction, referring to the EPA document, Stormwater Management for Construction Activities (EPA 832-R-92-005).

Erosion control measures must include all of the following:

- ▶ Stockpile and protect disturbed topsoil from erosion (for reuse);
- ▶ Control the path and velocity of runoff with silt fencing or comparable measures;
- ▶ Protect on-site storm sewer inlets, streams, and lakes with straw bales, silt fencing, silt sacks, rock filters, or comparable measures;
- ▶ Provide swales to divert surface water from hillsides, and
- ▶ No compaction inside the drip ring of existing trees and shrubs.

Intent

Erosion and sediment control during site development keeps soils on site, reduces stormwater runoff, and prevents sediment from entering local waterways. Erosion and sediment control helps to avoid stormwater related problems that can delay construction, cause environmental degradation to creeks, streams and lakes and damage public and private properties downstream.

3-2	Surface Water Management
	MANDATORY (for projects disturbing ground)

How

Capture, retain, infiltrate, and/or harvest rainfall equivalent to up to 1.25" per rainfall event.

Intent

Stormwater quality can be improved with better site planning and development to reduce post-construction runoff volume. This can be accomplished by decreasing impervious area and increasing emphasis on infiltration practices as described by the guidelines found in the Iowa Stormwater Management Manual.

Reducing stormwater runoff through design and management techniques increases on-site filtration, prevents pollutants from entering waterways, and reduces soil erosion. Water storage and nutrient collection processes reduce the need for irrigation and contribute to forming a healthier ecological community within the landscape.

Recommendations

- ▶ Seek out contractors successfully completing Rainscaping Iowa training, with a preference for contractors that are Rainscaping Iowa certified Rainscapers or utilize your project to assist a trained Rainscaper to complete a Rainscaping project towards their certification. See www.rainscapingiowa.org for more information.

Section 4: Water Conservation

4-1	Water Reuse
	OPTIONAL (maximum 10 Points)

How

Harvest, treat, and reuse rainwater and/or gray-water to meet a portion of the project’s water needs.

To achieve optional points, provide the defined percentage of the project’s total water needs through rainwater and /or gray-water (using either one or a combination of both strategies). Total water needs include all exterior and interior water use.

TOTAL WATER NEEDS SUPPLIED BY RAINWATER AND/OR GRAY-WATER	NUMBER OF OPTIONAL POINTS
10%	2 points
20%	4 points
30%	6 points
40%	8 points
≥ 50%	10 points

Intent

Rainwater and gray-water reuse strategies reduce the need for municipal water supplies and sewage treatment.

Recommendations

- ▶ Seek out contractors successfully completing Rainscaping Iowa training, with a preference for contractors that are Rainscaping Iowa certified Rainscapers or utilize your project to assist a trained Rainscaper to complete a Rainscaping project towards their certification. See www.rainscapingiowa.org for more information.
- ▶ Rainwater can be harvested from impervious surfaces such as roofs and carried via gutters and downspouts to a storage tank or cistern where it can be treated or filtered for potable uses. Untreated rainwater may be used for non-potable uses.
- ▶ Gray-water may be stored and treated for non-potable uses such as toilet flushing and irrigation.
- ▶ Rainwater and gray-water systems are subject to state and local regulations and special requirements. In some jurisdictions, rainwater or gray-water systems may not be allowed. Check with your local building code officials for requirements.
- ▶ Consider striving for rainwater and gray-water utilization beyond 20%. In some cases, employing rainwater and gray-water harvesting, treatment, and reuse can provide for all of a project’s water needs.

Section 5: Energy Efficiency

5-1

Efficient Lighting: Exterior

MANDATORY

How

Rehabilitation — All Buildings:

If being replaced, install ENERGY STAR compact fluorescents or LEDs with a minimum efficacy of 45 lumens / watt, equipped with daylight sensors on all outdoor lighting, including front and rear porch lights in single-family homes.

- ▶ Fixtures should include automatic switching on timers or photocell controls for all lighting not intended for 24-hour operation or required for security.
- ▶ All fixtures must be full cut-off fixtures that shield light pollution from the night sky.

Intent

Energy reductions through efficient lighting products contribute to lower utility costs and lower greenhouse gas emissions.

Recommendations

Design outdoor lighting to eliminate light trespass from the project site and to minimize impact on nocturnal environments.

Section 6: Materials Beneficial to the Environment

6-1a	Construction Waste Management
	MANDATORY

How

Reduce the amount of construction waste sent to the landfill.

- ▶ Investigate and document local options for diversion (recycling, reuse, etc.) of all anticipated major constituents of the project waste stream, including cardboard packaging and “household” recyclables (e.g., beverage containers).
- ▶ Commit to following a waste management plan that is appropriate for the site and local conditions, and that prevents, recycles, or salvages at least 25 percent of non-hazardous construction and demolition debris. Mixed used projects may base their prevention and recycling amounts on the National Association of Home Builders’ Research Center’s industry average of 4.2 pounds of waste per conditioned square foot. See table below to calculate debris prevention and recycling for home projects.

(Source: “Table 27: Waste Diversion,” *LEED for Homes Rating System*, pg. 84)

Amount to Landfills and Incinerators			
Reduced construction waste		Increased waste diversion	
Pounds/ft ²	Cubic Yards/1,000 ft ²	Percentage waste	Percentage diverted
4.0	25.5	100	0
3.5	22.3	88	12
3.0	19.1	75	25
2.5	15.9	63	37
2.0	12.8	50	50
1.5	9.6	38	62
1.0	6.4	25	75
.5	3.2	13	87

Intent

The amount of job-site waste resulting from construction of the average (2000 sq. ft.) U.S. home is 4 pounds per square foot of conditioned space, totaling about 8,000 pounds and taking up 50 cubic yards of landfill space. To the extent possible, waste should be avoided because 1) landfill space is rapidly diminishing, 2) incineration produces pollutants, and 3) waste of materials is in itself a negative environmental impact. (Source: National Association of Home Builders Research Center, 2001)

Approximately 20 percent of waste landfilled in Iowa is construction and demolition debris. An estimated 520,000 tons of construction and demolition debris are landfilled in Iowa annually.

6-1b	Construction Waste Management: Additional Diversion
	OPTIONAL
	(5 additional points for each additional 25% of debris prevented, salvaged or recycled; up to 15 points)

How

Reduce the amount of construction waste sent to the landfill by an additional 25 percent or more.

6-2

Durable and Low Maintenance Exteriors

MANDATORY

How

Specify durable siding materials such as masonry or fiber-cement to reduce or eliminate rot and reduce need for painting. Specify roofing products with ≥ 30-year life and document how product will save energy. Use at least 25 percent reclaimed materials or recycled content materials such as brick, framing lumber, recycled concrete and aggregates, and fly ash concrete OR select long lived non-toxic materials such as brick or cement fiber siding.

Intent

The use of more durable building materials and building materials that positively impact energy use, result in lower long-term maintenance and operating costs, and improve building value is a best practice.

6-3

Recycled Content Material

OPTIONAL
(Up to 10 points)

How

A building material must make up at least 90% of the project component either by weight or by volume to qualify under this measure. A qualifying building material must be composed of at least 25% post-consumer recycled content or at least 50% post-industrial recycled content to achieve 2 points. The following table lists the project components and example materials that a team can incorporate for optional points. Each material that meets the requirements of this Criterion is worth 2 points.

Project Component	Building Material (Examples)
Framing	Wood, concrete, steel, aluminum
Siding or masonry	Wood, metal, masonry
Concrete / cement and aggregate	Urbanite
Roofing	Wood shingles, asphalt shingles, tile, metal
Insulation	Fiberglass batt, cellulose, rigid panel
Sheathing	Plywood, OSB

Intent

Use of building materials with recycled content reduces the negative environmental impact resulting from extraction and processing of virgin materials.

Recommendations

Consider the incorporation of recycled content building materials from the early stages of project design.

6-4

Certified, Salvaged and Engineered Wood Products

OPTIONAL
(5 Points)

How

Commit to using wood products and materials of at least 25%, by cost that are either:

- ▶ Certified in accordance with the Forest Stewardship Council
- ▶ Salvaged products
- ▶ Engineered framing materials that do not include urea formaldehyde-based binders (see Criterion 7.3)

The percentage of certified, salvaged, and engineered wood products is based on cost or value.

Intent

Less than 10% of the old growth forest remains in the United States. The use of salvaged wood and engineered wood products precludes the need to use old-growth lumber. Forest Stewardship Council-certified wood encourages forestry practices that are environmentally responsible.

Equation

Sum of the value of all certified, salvaged, or engineered wood products	÷	The value of all wood products as structural components	=	Percentage of total wood products that meet this criterion
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6-5

Reducing Heat-Island Effect – Roofing

OPTIONAL
(5 Points)

How

Option 1

Use ENERGY STAR-compliant roofing, which requires:

	Roof Slope	Initial Solar Reflectance	Maintained Solar Reflectance	Emissivity
Low slope	≤ 2:12	≥ 0.65	≥ 0.50	0.8
Steep slope	> 2: 2	≥ 0.25	≥ 0.15	0.8

Emissivity should be greater than or equal to 0.8 when tested in accordance with ASTM 408. For Option 1, 100% of the roof area must meet the requirements above to achieve optional points.

OR Option 2

Install a “green” (vegetated) roof for at least 50% of the roof area.

Combinations of Energy Star-compliant and vegetated roofing can be used, providing they collectively cover 75% of the roof area.

Intent

Urban heat islands increase local air temperatures due to the absorption of solar energy by the built environment. Reducing the heat island effect decreases energy consumption by decreasing loads on cooling systems.

Recommendations

Avoid PVC membrane roofing, which is manufactured using phthalates, a chemical listed on December 30, 2009 by EPA as a “chemical of concern” to human health: www.epa.gov/oppt/existingchemicals/pubs/ecactionpln.html.

Section 7: Healthy Living Environment

7-1	Low / No VOC Paints and Primers
	MANDATORY

How

Specify that all interior paints and primers must comply with current Green Seal standards for low VOC limits. Specify pre-finished products or low VOC stains, varnishes, and lacquers.

Intent

VOCs are chemicals containing carbon molecules that are volatile enough to evaporate from material surfaces into indoor air at normal temperatures. Interior paints and primers that release VOCs may pose health hazards to residents and workers. Outdoors, VOCs react with sunlight and nitrogen in the atmosphere to form ground level ozone, a chemical that has a detrimental effect on human health and ecosystems. Ozone damages lung tissue, reduces lung function, and sensitizes the lungs to other irritants. Use of low-VOC paints and primers will reduce the concentration of such airborne chemicals.

7-2	Low / No VOC Adhesives and Sealants
	MANDATORY

How

All adhesives must comply with Rule 1168 of the South Coast Air Quality Management District. All caulks and sealants must comply with Regulation 8, Rule 51, of the Bay Area Air Quality Management District (BAAQMD).

VOC Limits

South Coast Air Quality Management District (AQMD), Rule 1168, establishes VOC limits for adhesives: www.aqmd.gov/rules/reg/reg11/r1168.pdf.

AQMD Architectural Applications Current VOC Limit

Less water and less exempt compounds in grams per liter

Product Type	VOC Limit (G / L)
Indoor carpet adhesives	50
Carpet pad adhesives	50
Outdoor carpet adhesives	150
Wood flooring adhesives	100
Rubber floor adhesives	60
Subfloor adhesives	50
Ceramic tile adhesives	65
VCT and asphalt tile adhesives	50
Drywall and panel adhesives	50
Cove base adhesives	50
Multipurpose construction adhesives	70
Structural glazing adhesives	100
Single-ply roof membrane adhesives	250

Bay Area Air Quality Management District Regulation 8, Rule 51, establishes VOC limits for sealants: www.baaqmd.gov/

8-51-301 Adhesive Product, Application Limits: Except as provided in Section 8-51-305, a person shall not use in the following applications any adhesive product with a VOC content, as defined in Section 8-51-226, that exceeds the following VOC limits (expressed as grams of VOC per liter):

BAAQMD VOC Standards	VOC Limit (G / L)
Indoor floor covering installation	150
Multipurpose construction	200
Nonmembrane roof installation / repair	300
Outdoor floor covering installation	250
Single-ply roof material installation / repair	250
Structural glazing	100
Ceramic tile installation	130
Cove base installation	150
Perimeter bonded sheet vinyl flooring installation	660

More information can be found online at www.baaqmd.gov/~media/Files/Planning%20and%20Research/Rules%20and%20Regs/reg%2008/rq0851.ashx

Intent

Interior adhesives and sealants may release VOCs, particularly when wet. Exposure to individual VOCs and mixtures of VOCs can cause or aggravate health conditions, including allergies, asthma, and irritation of the eyes, nose, and airways; however, no health-based standards for indoor non-occupational exposure have been set.

Recommendations

- ▶ Many construction adhesives are not capable of adhering at temperatures below 40°F. Projects located in cold climates only (Climate Zones 6 and 7, based on IECC 2006) may be exempted from the required low-VOC adhesives and sealants if they prove problematic due to the above reason. In this instance, please identify in the project submittal documents if other adhesives and/or sealants were needed and at what stage of construction the project team was unable to use required low-VOC products.
- ▶ Avoid epoxy-based caulks and epoxy-based sealants, as these contain Bisphenol A. Bisphenol A was listed on March 29, 2010 by the EPA as a “chemical of concern.” See: www.epa.gov/oppt/existingchemicals/pubs/ecactionIn.html

7-3	Composite Wood Products that Emit Low / No Formaldehyde
	MANDATORY

How

All composite wood products (plywood, OSB, MDF, cabinetry) must be certified compliant with California 93120. If using a composite wood product that does not comply with California 93120, all exposed edges and sides must be sealed with low-VOC sealants, per Criterion 7-2.

Intent

Composite wood products using formaldehyde-based binders will emit formaldehyde, which is a volatile organic compound. Symptoms of exposure vary widely and include a host of bodily reactions. Avoiding products that emit formaldehyde will reduce the quantity of harmful indoor air contaminants.

Recommendations

- ▶ Make this requirement part of the specifications for sub-contractor submittals. Obtain the manufacturer's specifications to determine whether materials meet this requirement. Seek composite wood products compliant with California 93120. California 93120 is a regulation issued by the California Air Resources Board (CARB) limiting allowable formaldehyde emissions from composite wood products.
- ▶ Seek composite wood products with no added formaldehyde-based compounds in the contents. Seek composite wood products with CARB No Added Formaldehyde (NAF) certification. Also, Scientific Certification Systems offers a Formaldehyde Free certification, and product listings are available at www.scscertified.com/products/index.php
- ▶ If feasible, specify formaldehyde-free hardwood, plywood, particleboard, or medium density fiberboard.

Things to Consider

- ▶ In July 2010, the U.S. Congress passed Public Law No: 111–199, the S. 1660: Formaldehyde Standards for Composite Wood Products Act, which updates the Toxic Substances Control Act of 1976 to align with the recent California legislation 93120. More information on Public Law No: 111–199 S.1660 can be found online at www.govtrack.us/congress/bill.xpd?bill=s111-1660.
- ▶ A summary of the Toxic Substances Control Act of 1976 can be found online at the EPA's website at www.epa.gov/lawsregs/laws/tsca.html
- ▶ The California Air Resources Board approved an Airborne Toxic Control Measure in April 2007 to reduce formaldehyde emissions from composite wood products including hardwood plywood, medium-density fiberboard, and particleboard (Title 17, California Code of Regulations 93120-93120.12). California 93120. More information can be found at: www.arb.ca.gov/regact/2007/compwood07/fro-final.pdf

7.4

Lead Paint & Asbestos Abatement

MANDATORY

How

Follow all applicable state requirements and federal requirements related to asbestos inspection, identification, notice, disturbance, removal and handling including, but not limited to, 40 CFR Section 61.145. For properties built before 1978, use lead-safe work practices consistent with the EPA's Renovation, Repair, and Painting Regulation (RRP) (40 CFR 745) and applicable HUD requirements at 24 CFR 35.

Intent

Effects on the lungs are a major health concern from asbestos. Asbestos is a hazardous air pollutant that has been used in building materials, paper products, plastics and other products and is still used generally in the construction industry. Any activity that disturbs painted surfaces or project components in pre-1978 dwellings that contain lead-based paint may generate and spread lead dust and debris, increasing the risk of lead poisoning for exposed children and families. Controlling lead dust and debris helps minimize lead in the environment.

Recommendations

- ▶ Undertake a lead inspection to determine if the property or surfaces to be disturbed contain lead-based paint.
- ▶ Undertake the appropriate training and certification for staff and ensure that contractors are meeting the lead RRP requirements.

Things to Consider

- ▶ Iowa Department of Natural Resources asbestos website, <http://www.iowadnr.gov/Environment/AirQuality/HazardousAirPollutants/Asbestos.aspx>

- ▶ U.S. Environmental Protection Agency: www.epa.gov/lead/pubs/traincert.htm and U.S. Department of Housing and Urban Development: www.hud.gov/offices/lead/training/index.cfm
Information about lead-safe work practices
- ▶ U.S. Environmental Protection Agency, Small Entity Compliance Guide to Renovate Right EPA’s Lead-Based Paint Renovation, Repair, and Painting Program: www.epa.gov/lead/pubs/sbcomplianceguide.pdf and www.epa.gov/lead/pubs/renovation.htm
General information on compliance with these requirements

7-5	Ventilation: Rehabilitation
	OPTIONAL (10 points)

How

Meet or exceed the current ASHRAE ventilation standard 62.1-2010 for commercial and institutional buildings but not less than the values required by local code unless approved by the authority with jurisdiction.

Intent

Optimal ventilation improves indoor air quality and the flow of fresh air throughout the home, contributing to a healthier living environment.

Recommendations

- ▶ With continuous, demand-controlled, or other centralized ventilation systems, the project team (specifically, the designer, installer, and maintenance staff) should ensure that the systems are balanced from unit to unit to meet the requirements of ASHRAE 62.2-2010.
- ▶ Also, consider the following guidance:
 - For fans designed to exhaust more than 250 cfm, consider using ECM with speed controllers mounted near the fan for ease of balancing.
 - For fans designed to exhaust less than 250 cfm, consider using direct drive with speed controller mounted near the fan for ease of balancing.
- ▶ For climate-specific strategies, project teams should consult ASHRAE 62.2-2010.
- ▶ For projects located in hot and humid climates, systems should be designed to be capable of ASHRAE 62.2 ventilation levels. Supplemental dehumidification is likely necessary for compliance in these climates to maintain comfort during times of high ambient relative humidity. Additionally, the goal should be to design a system to meet ASHRAE requirements and then provide for additional accommodations to adjust the amount of outside airflow being introduced.
- ▶ Consider the following controls for introducing outside air:
 - Flow control / butterfly damper to allow for control over the amount of air being introduced through the outside air intake.
 - Shut-off damper (electronic or barometric) to close off the outside air intake when the HVAC system is not calling for air.
 - Fan timer /cycler on the system that allows for control over how many minutes of a “system run cycle” that the outside air intake remains open.
 - Per ASHRAE ventilation requirements, reliance on operable windows is not permitted as a strategy to meet ASHRAE 62.2 whole-building ventilation requirements.

Basements and Concrete Slabs – Vapor Barrier**MANDATORY**

(If basement floor/slab is affected)

How

Follow the specifications below.

Beneath concrete slabs, including basements:

- ▶ Provide vapor barriers under all slabs.
- ▶ For concrete floors either in basements or the on-grade slab, install a capillary break of 4 inches of clean or washed gravel (0.5 inch diameter or greater) placed over soil.
- ▶ Cover all gravel with a 6-millimeter polyethylene sheeting moisture barrier, with joints lapped 1 foot or more to prevent moisture from migrating from the soil through the slab to a living or storage area.
- ▶ Install at least 1" extruded polystyrene below the slab in addition to the vapor barrier to control mold growth.
- ▶ Place a capillary break on top of footing between footing and foundation wall to stop capillary action.
- ▶ On interior below-grade walls, avoid using separate vapor barrier or a below-grade vertical insulation (such as polyethylene sheeting, vinyl wallpaper or foil faced), which can trap moisture inside wall systems. Semi-vapor permeable rigid insulation is not considered a vapor barrier.

Beneath Crawl Spaces

- ▶ Install 8-mil minimum thickness cross-laminated polyethylene on the crawl floor, extended at least 12 inches up on piers and foundation walls, and with joints overlapping at least 12 inches. (The 8-mil polyethylene and the cross-lamination ensure longevity of the poly.)
- ▶ Line the likely "high-traffic" areas of the crawl space with foam board, so the polyethylene beneath will not be disturbed.

Intent

Water can migrate through concrete and most other masonry materials. Proper foundation drainage prevents water from saturated soils from being pushed by hydrostatic pressure through small cracks. Vapor barriers and waterproofing materials can greatly reduce the migration of moisture that can occur even in non-saturated soils. Installation of radon-resistant features will reduce concentrations of radon, a cancer-causing soil gas that can leak into homes through cracks in the slab and foundation.

Recommendations

- ▶ Ensure that other trades' work does not puncture the vapor barrier.

How

Provide drainage of water to the lowest level of concrete away from windows, walls, and foundations by implementing the following techniques:

- ▶ Water management – Walls
 - Provide a weather resistive barrier with sheets lapped, shingle style, especially over windows, doors and other penetrations to prevent rain water that penetrates the finished exterior cladding system, from entering the wall assembly or being introduced into window or door openings;
 - Provide a pathway for liquid water that has penetrated the cladding system or accumulates due to daily or seasonal changes in thermal and humidity levels behind the cladding system to safely exit the exterior wall assembly;
 - Flashing and/or weather-resistive barriers installed in rough window and door openings must integrate with window and door unit flashings, particularly at the sill and head; OR install pan flashing, side flashing that extends over pan flashing, and Head Flashing (top flashing) that extends over side flashing on windows and exterior door openings. Apply window pan flashing over building paper at sill and corner patches; and
 - Flashings at roof wall intersections and at penetrations through the wall (i.e. plumbing, electrical, vents, HVAC refrigerant lines, etc.) must be integrated with the drainage plane to keep water from entering the wall assembly.
- ▶ Water Management - Roof Systems
 - Installation of drip edge at entire perimeter of roof;
 - Flashing where sloped roofs meet gable wall end/all vertical wall integrated into building drainage plane;
 - Use of kick-out flashings at all wall eave intersections integrated into drainage plane; and
 - At wall/roof intersections maintain ≥ 2 " clearance between wall cladding and roofing materials.
- ▶ Integrity and Continuity of the Thermal Barrier
 - The drainage plane, when properly sealed, can also reduce airflow through the wall assembly, which improves the thermal performance of the cavity insulation.

Intent

Diverting water from the building prevents bulk water entry into foundations and basements, which can contribute to moisture-related problems such as mold and the deterioration of wood and other building materials. Flashing helps direct water away from wall cavities to the drainage plane. Careful architectural detailing of the drainage system and construction supervision ensures proper water drainage.

7-8	Integrated Pest Management
	MANDATORY

How

Seal all wall, floor, and joint penetrations with low VOC caulking to prevent pest entry. Provide rodent and corrosion proof screens (e.g., copper or stainless steel mesh) for large openings.

Intent

Sealing of cracks and penetrations will minimize entry points for pests such as rodents and cockroaches.

7-9	Smoke-free Building
	OPTIONAL (2 Points)

How

Implement and enforce a “no smoking” policy in all common and individual living areas of all buildings. Common areas include rental or sales offices, entrances, hallways, resident services areas, and laundry rooms.

Intent

Secondhand smoke is the third leading cause of preventable death in the country. Air filtration and ventilation systems do not eliminate the health hazards caused by secondhand smoke. Tobacco smoke from one unit may seep through the cracks, be circulated by a shared ventilation system, or otherwise enter the living space of another. In addition to the negative health effects, smoking significantly increases fire hazard, and increases cleaning and maintenance costs. Also, many property insurance companies offer a discount for buildings with no-smoking policies.

Section 8: Operations and Maintenance

8-1	Building Maintenance Manual
	MANDATORY OPTIONAL (for façade only projects – 10 points)

How

Provide a manual that addresses the following:

- ▶ Operations and maintenance guidance for all appliances
- ▶ HVAC operation and maintenance schedule
- ▶ Location of water-system turnoffs
- ▶ Lighting equipment
- ▶ Paving materials and landscaping
- ▶ Green cleaning products and schedule(s)
- ▶ Pest control
- ▶ Any other systems within the project, including renewable energy systems if applicable
- ▶ An occupancy turnover plan that describes the turnover process, including all materials that are frequently replaced at turnover and the process of educating the residents about proper use and maintenance of all project systems

Intent

Regular building maintenance using green methods helps minimize utility consumption and provides a healthy and durable living environment for residents.

Recommendations

- ▶ During the design process, keep a running list of how maintenance and landscaping teams and residents may need to be involved with the building in order to ensure that its lifespan is maximized and that it will perform as intended. Once the project team has completed the integrative design process (see Criterion 1.1), amend templates of the Operations and Maintenance documents with project-specific information for maintenance and residents. By working in this manner, Operations and Maintenance documents will be informed by the development process and completed at the same time the project is ready for occupancy.
- ▶ Manuals and other training materials are most effective when presented in conjunction with training sessions. These educational sessions give the project maintenance staff an opportunity to share best practices and troubleshoot project performance problems together.
- ▶ Consider developing an integrated pest management (IPM) policy and, as part of that, develop guidance related to pesticide use, housekeeping, and prompt reporting of pest problems to be included in maintenance manuals.
- ▶ If the project is utilizing gray-water, design and institute a policy that requires biodegradable soaps, cleaners, and other products that are flushed down the drains.
- ▶ Provide maintenance staff with local information for handling hazardous waste, including fluorescent and compact fluorescent lighting (CFLs).

8-2	Occupant Manual
	MANDATORY OPTIONAL (for façade only projects – 10 points)

How

Provide a guide for tenants that explains the intent, benefits, use, and maintenance of green building features. The guide also should include the location of transit stops and other neighborhood amenities, and encourage additional green activities such as recycling, gardening, use of healthy cleaning materials, alternative measures to pest control, and purchase of green power.

Intent

Education on the operations and maintenance of the building will allow tenants to fully realize the environmental, health, and economic benefits that green housing offers. This resource is intended to familiarize tenants with the green features and methods used in their building.

Recommendations

- ▶ During the design process, keep a running list of how maintenance and landscaping teams and residents may need to be involved with the building in order to ensure that its lifespan is maximized and that it will perform as intended. Once the project team has completed the integrative design process (see Criterion 1.1), amend templates of the Operations and Maintenance documents with project-specific information for maintenance and residents. By working in this manner, Operations and Maintenance documents will be informed by the development process and completed at the same time the project is ready for occupancy.
- ▶ If the project is utilizing gray-water, design and institute a policy that requires biodegradable soaps, cleaners, and other products that are flushed down the drains.
- ▶ Provide tenants with two radon test kits designed for 48-hour exposure, and include instructions for use and follow-up action, per EPA’s Indoor Air Package.
- ▶ Provide residents with local information for handling household hazardous waste, including CFLs.

8-3	Tenant Orientation
	MANDATORY OPTIONAL (for façade only projects – 10 points)

How

Provide a comprehensive walk-through and orientation to the tenant using the Occupant Manual from 8-2 above that reviews the building’s green features, operations and maintenance, along with neighborhood conveniences that may facilitate a healthy lifestyle.

Intent

A walk-through and orientation will help ensure that the Green Development Plan achieves its intended environmental and economic benefits.

8-4	Project Data Collection and Monitoring System
	35 Points

How

Collect and monitor project performance data on energy, water, and, if possible, healthy living environments for a minimum of five years. Allow Iowa Economic Development Authority access to that data.

For sub-metered projects, property owner /developer must agree to collect utility release forms from a percentage of occupants/units to track actual utility data of a sample of homes or non-residential spaces (Example: Main Street redevelopment

project with two upper-story residential units and one first-floor commercial bay would collect release forms and data from at least one residential unit and the commercial bay). The following table identifies the percentage of units for which the property owner /developer must collect and track utility data, as based on the project size in total number of units.

Number of units	Percentage of units
0 – 25 units	50%
25 – 100 units	25%
100+ units	15%

Intent

A data collection and monitoring system helps project owners, on-site staff, and residents to understand project performance issues. Once an issue is identified, appropriate actions can be taken to maximize cost savings and health benefits associated with green building features.

Recommendations

- ▶ Use EPA’s Portfolio Manager to track utility data.
- ▶ Ensure that the training for residents and building maintenance staff includes information on how to effectively use the data collection, monitoring, and reporting system.
- ▶ Multifamily building data can be tracked and analyzed using EPA’s Portfolio Manager Tool.
- ▶ Property owners have indicated that the best time to collect tenant utility data release forms is during tenant lease-up.
- ▶ Whole-project energy monitoring systems (also known as smart meters) are a strategy that can help a project attain optional points under Criterion 5.8

Appendix A

Green Development Plan and Checklist

Must include a **Site Plan** indicating distance of utilities and sidewalk connections as appropriate. Must include **Context Map** indicating locations of minimally required community facilities and their distances from project boundaries.

Mandatory Optional

Completed	Item	Intended Method of Satisfying Green Criteria	Yes, No or NA	Points	Champion (name and profession/role)	Additional Comments by Applicant
Section 1: Integrated Design						
	1-1a	Green Development Plan: Integrative Design Meeting(s)				
	1-1b	Green Development Plan: Criteria Documentation				
	1-2	Applicant/Recipient, Architect/Project Designer, Contractor Certification				
	1-3	Accessibility Rehabilitation (Optional, <i>see full criteria</i>)				
				Section 1 Subtotal		
Section 2: Site, Location and Neighborhood Fabric						
	2-1	Downtown Design Standards (Optional 15 points)				
	2-2	Passive Solar Heating / Cooling (Optional 4 points) (Site map must demonstrate that project satisfies this item)				
	2-3a	Grayfield or Brownfield (Optional 15 points)				
	2-3b	Adaptive Reuse Site (Optional 12 points)				
	2.4	Previous Historic Efforts (Optional 12 points)				
	2.5	Historic District Listing (Optional 30 points)				
	2.6	Individual Listings (Optional 5 points per building)				
				Section 2 Subtotal		
Section 3: Site Improvements						
	3-1	Erosion and Sedimentation Control				
	3-2	Surface Water Management				
				Section 3 Subtotal		
Section 4: Water Conservation						
	4-1	Water Reuse (Optional, <i>see full criteria</i>)				
				Section 4 Subtotal		
Section 5: Energy Efficiency						
	5-1	Efficient Lighting - Exterior				

Completed	Item	Intended Method of Satisfying Green Criteria	Yes, No or NA	Points	Champion (name and profession/role)	Additional Comments by Applicant
			Section 5 Subtotal			
Section 6: Materials Beneficial to the Environment						
6-1a	Construction Waste Management					
6-1b	Construction Waste Management: Additional Diversion (Optional 5 to 15 points)					
6-2	Durable & Low Maintenance Exteriors					
6-3	Recycled Content Material (Optional, <i>see full criteria</i>)					
6-4	Certified, Salvaged and Engineered Wood (Optional 5 points)					
6-5	Reducing Heat-Island Effect – Roofing (Optional 5 points)					
			Section 6 Subtotal			
Section 7: Healthy Living Environment						
7-1	Low/No VOC Paints and Primers					
7-2	Low/No VOC Adhesives and Sealants					
7-3	Composite Wood Products that Emit Low/ No Formaldehyde					
7-4	Lead Paint and Asbestos Abatement					
7-5	Ventilation: Moderate Rehab (Optional 10 points)					
7-6	Basements and Concrete Slabs - Vapor Barrier					
7-7	Water Drainage					
7-8	Integrated Pest Management					
7-9	Smoke-free Building (Optional 2 points)					
			Section 7 Subtotal			
Section 8: Operations and Maintenance						
8-1	Building Maintenance Manual					
8-2	Occupant Manual					
8-3	Homeowner /Tenant Orientation					
8-4	Project Data Collection and Monitoring System (Optional 35 points)					
			Section 8 Subtotal			
			Grand Total			

Appendix B

Certification of Intent to Comply

Required: Submit this certification at time of application.

The project applicant and project architect/project designer are required to sign the certification below at the time of application submittal to the Iowa Economic Development Authority. By signing this certification, the project applicant and project architect/project designer are certifying their intent to comply with all of the **MANDATORY** Iowa Green Streets Criteria applicable to the project as determined by the Iowa Economic Development Authority. This certification also certifies the intent to complete the optional Iowa Green Streets Criteria proposed in the applicant's proposal.

To be Completed by Applicant	
Signature:	
Name:	
Title:	
Tel. No.:	
E-mail:	
Accreditation: (if applicable)	
Date:	

To be Completed by Project Architect/Project Designer	
Signature:	
Name:	
Title:	
Tel. No.:	
E-mail:	
Accreditation: (license/ licensing body)	
Date:	

Appendix C

Certification of Construction Contract Document Compliance

Required: Submit this certification prior to issuing construction documents for bidding.

The project architect/designer is required to initial the project plan and spec book checklist below indicating that the Iowa Green Streets Criteria have been addressed in the project plans and specifications. The project applicant/recipient and project architect/project designer are required to sign the certification below this checklist prior to issuing construction documents for bidding. By signing this certification, the project applicant and project architect/project designer are certifying that the construction documents comply with all of the **MANDATORY** Iowa Green Streets Criteria applicable to the project as determined by the Iowa Economic Development Authority. This certification also certifies that the construction documents comply with all optional Iowa Green Streets Criteria in the applicant's project proposal.

Project Plan and Spec Book Checklist

CRITERION	PROJECT PLANS	SPEC BOOK	ARCHITECT/DESIGNER INITIALS
1.1a-b Green Development Plan			
1.2 Applicant/Recipient, Architect/Project Designer, and/or Contractor Certification			
1.3 Accessibility	X	X	
2.1 Downtown Design Standards			
2.2 Passive Solar Heating/Cooling	X		
2.3a-b Site Reuse	X		
2.4 Previous Historic Efforts			
2.5 Historic District Listing			
2.6 Individual Listings			
3.1 Erosion and Sedimentation Control	X	X	
3.2 Surface Water Management	X	X	
4.1 Water Reuse	X	X	
5.1 Efficient Lighting		X	
6.1a-b Construction Waste Management		X	
6.2 Durable and Low-Maintenance Exteriors	X	X	
6.3 Recycled Content Material		X	
6.4 Certified, Salvaged, and Engineered Wood Products		X	
6.5 Reducing Heat Island Effect		X	
7.1 Low/No VOC Paints and Primers		X	
7.2 Low/No VOC Adhesives and Sealants		X	
7.3 Composite Wood Products that Emit Low/No Formaldehyde		X	
7.4 Environmental Remediation	X	X	
7.5 Ventilation	X	X	
7.6 Basements and Concrete Slabs: Vapor Barrier	X	X	
7.7 Water Drainage	X	X	
7.8 Integrated Pest Management	X	X	
7.9 Smoke Free Building		X	
8.1 Maintenance Manual			
8.2 Occupant Manual			
8.3 Tenant Orientation			
8.4 Project Data Collection and Monitoring System			

To be Completed by Applicant/Recipient	
Signature:	
Name:	
Title:	
Tel. No.:	
E-mail:	
Accreditation: (if applicable)	
Date:	

To be Completed by Project Architect/Project Designer	
Signature:	
Name:	
Title:	
Tel. No.:	
E-mail:	
Accreditation: (license/ licensing body)	
Date:	

Appendix D

Certification of Compliance at End of Construction

Required: Submit this certification at time of construction completion.

The project applicant/recipient, project architect/project designer, general contractor, and HVAC contractor are required to sign the certification below at time of construction completion. By signing this certification, all signing parties are certifying that the project as constructed complies with all of the **MANDATORY** Iowa Green Streets Criteria applicable to the project as determined by the Iowa Economic Development Authority. This certification also certifies that the project as constructed complies with all of the optional Iowa Green Streets Criteria in the applicant's project proposal.

To be Completed by Applicant/Recipient	
Signature:	
Name:	
Title:	
Tel. No.:	
E-mail:	
Accreditation: (if applicable)	
Date:	

To be Completed by Project Architect/Project Designer	
Signature:	
Name:	
Title:	
Tel. No.:	
E-mail:	
Accreditation: (license/licensing body)	
Date:	

To be Completed by General Contractor	
Signature:	
Name:	
Title:	
Tel. No.:	
E-mail:	
Accreditation: (license/licensing body)	
Date:	

To be Completed by HVAC Contractor	
Signature:	
Name:	
Title:	
Tel. No.:	
E-mail:	
Accreditation: (license/licensing body)	
Date:	

Appendix E

Energy Performance Certification - Rehabilitation

Required:

Commercial or Residential (>3 stories) – Energy Rater / Energy Professional submits Code Certificate and energy modeling information and completes and signs certification below for submittal by project applicant/recipient.

The project's independent, third-party energy rater, or energy professional for non-residential projects is required to sign the certification below at time of construction completion. By signing this certification, the energy rater is certifying that the project, as constructed, complies with all of the **MANDATORY** Iowa Green Streets Criteria energy related criteria applicable to the project as determined by the Iowa Economic Development Authority including the following criteria:

- ▶ **5.1e, Efficient Energy Use – Mid- and High-Rise Multifamily and Non-Residential**
 - Energy performance of the completed building meets or exceeds ASHRAE 90.1-2007 without the addition of electric-generating renewable energy systems.

AND

- ▶ **5.2, Energy Star and Energy Efficient Appliances** (if providing appliances)
- ▶ **5.3a, Efficient Lighting: Interior**
- ▶ **5.4, HVAC Sizing, Installation and Duct Systems** (residential projects)
 - Heating & cooling equipment sized in accordance with the Air Conditioning Contractors of America (ACCA) Manual, Parts D, J and S, ASHRAE handbooks, or equivalent software

To be Completed by Architect, Designer, Engineer, or Energy Professional	
Signature:	
Name:	
Title:	
Tel. No.:	
E-mail:	
Accreditation: (if applicable)	
Date:	