

Development Standards Guide

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GCCDS

Gulf Coast Community Design Studio
Mississippi State University College of Architecture Art + Design

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Introduction

About the Gulf Coast Renaissance Corporation and its Builder & Developer Guild

Soon after its formation in the wake of Hurricane Katrina, the Gulf Coast Business Council—which represents the interests of businesses along the Coast—realized that the region’s recovery would not occur in a balanced and efficient manner unless one entity was created and empowered to remove the obstacles associated with the redevelopment of the coastal communities. In response to the unprecedented need, the Gulf Coast Business Council formed the Gulf Coast Renaissance Corporation to guide the redevelopment effort, to prevent further deterioration of housing stock, and to ensure an equitable distribution of housing for the workforce.

The vision of the Gulf Coast Renaissance Corporation is:

- To serve as the capstone organization in the rebuilding of the Mississippi Gulf Coast by removing obstacles to the redevelopment, creating partnerships, and stimulating investment in order to create vibrant, diverse, sustainable communities that offer residents the highest quality of life.
- The Renaissance Corporation’s mission is to foster the redevelopment of communities as environmentally, economically, and socially sustainable through responsible land use practices with a particular focus on mixed-use and mixed-income communities.
- To carry out this mission the Gulf Coast Renaissance Corporation, in partnership with the Gulf Coast Community Design Studio—a professional outreach program of Mississippi State University’s College of Architecture, Art + Design—created the Renaissance Builder & Developer Guild—a design and education centerpiece for the Renaissance Corporation. The Guild is charged with administering high, yet attainable development standards that qualify projects for financial assistance from the Renaissance Corporation and that offer recognition to projects not financially supported by the Renaissance Corporation but which exhibit good, sustainable design.

The Guild’s Guiding Principles

To direct the creation of its Development Standards, the Renaissance Guild first identified a set of Guiding Principles, drawing on established best practices for sustainable development:

1. Create a range of housing types and affordable price levels.
2. Foster distinctive, attractive communities with a strong sense of place.
3. Encourage developments that strengthen existing communities.
4. Mix land uses.
5. Create walkable neighborhoods.
6. Encourage public and private collaborations shaped by community and stakeholder participation.
7. Make development decisions predictable, fair, sustainable, and cost effective.
8. Preserve open space, farmland, natural beauty, and critical environmental areas.
9. Consider transportation needs and encourage a variety of transportation options.
10. Take advantage of compact building design.
11. Create development sites with low environmental impact.
12. Create energy efficient buildings incorporating Energy
13. Star or greater standards.
14. Create healthy living spaces.

Developing the Standards

With these guiding principles, the Gulf Coast Community Design Studio drew on the work of the Smart Growth Network, the Congress for the New Urbanism, and the US Green Building Council which, in conjunction with the National Resources Defense Council, has led the way in popularizing sustainable development standards in the United States through its various Leadership in Energy and Environmental Design or LEED rating programs. The reader will see these sources referenced throughout this Guide.

The Guild is committed to improving the Development Standards as the state of the art of sustainable development improves and as the Guild gains more experience in applying the Development Standards in the Gulf Coast region. However, because the Guild is focused on supporting affordable housing and the financial support for affordable housing can make cutting edge sustainable development practices unfeasible, the goal will always be to make the Development Standards easier to meet than what is at the cutting edge. At the same time the Guild encourages local developers to pursue recognition through rating systems like LEED whenever he or she feels that it is feasible for a particular project, and our standards are written in such a way that any project that would receive LEED certification would also receive Guild endorsement.

Why is this Guide Here?

Since the Guild published its first version of the Development Standards in August, 2008 it has received multiple questions from developers, design professionals, and others about the rationale of specific standards, the Development Standards in general, and what decisions developers could make to improve their projects' chances of receiving Guild endorsement. The Guild has also seen the need for more materials that it can use to support its founding mission to educate local professionals and stakeholders on best practices in development.

For these reasons, the Guild decided to publish a document that would accompany the Development Standards, and which would provide a level of information at a length somewhere between the one page Standards list and the hundreds of pages that accompany other sustainable development standard systems.

The Guild hopes that this document will make submitting projects for Guild evaluation faster, easier to understand, and more transparent, while providing more resources that can help developers, designer professionals, government officials, and the public understand the current state of the art in sustainable urban development.

The Evaluation Process

Step 1: A developer and/or his or her design team submit an application form and fee to the Builder & Developer Guild along with the materials required for Guild review as outlined in the Submission Requirements Checklist (both forms are available for download through the Gulf Coast Renaissance Corporation web site at <http://msgcrc.com>).

Step 2: The Renaissance Corporation staff reviews the application and may contact the developer for further information to ascertain the readiness of a project for Guild Review.

Step 3: If the Renaissance Corporation determines that the project is ready for review, the application and other materials are passed on to the Gulf Coast Community Design Studio for evaluation under the Development Standards.

Step 4: Gulf Coast Community Design Studio staff examine the documents submitted for review, make site visits, consult outside data sources, and contact the developer and/or his or her design team for further information as needed.

Step 5: The Gulf Coast Community Design Studio completes its evaluation and submits a report to the Renaissance Corporation with a recommendation for or against Guild endorsement.

Step 6: The Renaissance Corporation reviews the Studio's report, makes a final decision of endorsement, and forwards a copy of the report along with its endorsement decision to the developer. If a project receives endorsement and the developer is seeking financial support, the Renaissance Corporation will be begin discussing the terms of that support with the developer; if the developer is simply seeking recognition through the endorsement, the Renaissance Corporation will then work with the developer to offer marketing and publicity assistance.

If a project does not receive Guild endorsement, the Renaissance Corporation will encourage the developer to speak with the Design Studio staff about any changes that he or she could make to the project in order to receive Guild endorsement.

Scoring

Like other sustainable development rating systems, the Renaissance Builder & Developer Guild Development Standards are based on a cumulative point system. Most standards have required points, and a development project must earn those required points in order to receive Guild endorsement. For example, a project

may score highly under other standards, but if the project does not earn the three points required for Standard N1, then the project cannot earn Guild endorsement.

Most standards also have additional points (and some standards have only additional points) that a project can earn but which are not necessary for earning endorsement. Rather, these additional points recognize special efforts that developers make to go above and beyond the Development Standards' minimum requirements.

How to Use this Guide

This Reference Guide is a companion to the Renaissance Builder & Developer Guild Development Standards as adopted by the Guild in June, 2009 (available for download through the Gulf Coast Renaissance Corporation web site at <http://msgcrc.com>).

The Reference Guide is organized with a set structure for each category and each standard for ease of reference. A reader will find the following organization throughout the Guide:

- **Category Introduction:** A statement of the general intent for that category, a re-print of the relevant section of the Development Standards, a list of the relevant Renaissance Guild Guiding Principles, and a list of general resources that a reader can consult for more information on each category.
- For each standard, the reader will find:
- **Definitions:** Dictionary-style explanations of technical and special terms used in discussing the standard.
- **Intent:** Brief statements that explain the major motivations for including the standard in the Development Standards, followed by a longer discussion of the issues expressed in these statements and the benefits of compliance with the standard.
- **Implementation:** A preliminary set of actions that a developer and his or her design team should consider undertaking to meet the requirements of the standard.
- **Benefits to Developers:** The benefits that a developer may reap by complying with the standard.
- **Submission Requirements:** Documents that the developer should submit to the Guild for the evaluation of a project under the standard. This list is not exhaustive and developers may substitute other documents for those listed here, provided that the Guild deems that it can make a full evaluation from these other kinds of documents. These Submission Requirements are the same as those found in the Submission Requirements document (available for download through the Gulf Coast Renaissance Corporation web site at <http://msgcrc.com>).
- **Standards Referenced:** Where applicable, the technical specifications, laws, and other requirements set by bodies other than the Guild but which inform the standard (for example, Standard A1.1 includes reference to the environmental assessment criteria used to determine whether or not a site is a brownfield). This section includes links to the referenced standard's language or the body responsible for setting the standard.

- **Precedents:** Other environmentally sustainable building standards that informed the specific standard.
- **Additional Resources:** Resources for further reading and education regarding the issues and professional practice surrounding the standard.

The collective creativity and knowledge of developers, architects, landscape architects, urban planners, civil engineers, and environmental engineers greatly surpass what the Guild could ever communicate through one document. Nor can the Guild predict all of the potential, unique circumstances that individual developments face. For that reason, this guide should act as a starting point and does not attempt to be a definitive resource on what a developer and his or her designers can do to make a high-quality project that will pass a Guild review.

A Note about Data Sources

Please note that outside data providers which supply information relevant to project evaluation routinely update their data and change their methods for its collection and analysis. The Guild reserves the right to select the source that it deems most appropriate for project evaluation, and may use new data sources not outlined here if updates become available or methodologies change between updates to the Guide. In general, the Guild will reference whichever data source is most recent, provided that it offers the level of accuracy and completeness that the Guild deems necessary.

User Feedback

The Guild intends for this guide to be accessible to a wide range of readers: from developers and design professionals, to local officials, to members of the general public. As such, its authors have attempted to use plain language as much as possible. A reader with comments on the usability of this document should direct them to:

Product Disclaimer

While this Reference Guide discusses many kinds of building systems and practices, the Renaissance Builder & Development Guild does not endorse any specific product, material, technology, building system, or business practice. All research is provided in good faith, but accuracy is not guaranteed.

Before starting any construction it is important to consult with licensed architects, engineers, landscape architects, and contractors.

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Location Category

Introduction

The Location Category addresses a project's site within the Gulf Coast region and the relationship the project has with its natural and man-made surroundings. If the project is to be built on an infill piece of land, then we evaluate it using Criteria A1, while we evaluate non-infill and "greenfield" projects using Criteria A2.

The Development Standards intentionally make it easier to earn the necessary Location Category points by building on an infill site than on a non-infill site in order to encourage development within existing communities where infrastructure, services, and employment already exist and to discourage the conversion of farmland or undeveloped land to development. If a development is to be located on a greenfield site, then it must meet certain requirements in order to ensure that it will not contribute to sprawl nor destroy valuable natural resources.

Category	Criteria	Standard	Required Points	Additional Points		
Location Addresses the siting of projects to encourage investment in existing communities, protect natural areas from development, and promote alternatives to driving.	A1	Infill development	1	Site is in a developed area with added value for brownfield sites, renovation and adaptive reuse of existing buildings, previously developed sites, and other projects that reuse and revitalize existing neighborhoods	20	10
	OR			OR		
	A2	Non-Infill development	1	Site does not have a primary role in maintaining the ecological function and natural beauty of the area.	5	
			2	Site does not include wetlands, water bodies, or land within 100 feet of these areas; OR if the project site includes wetlands, water bodies or land within 100 feet of these areas, and local, state, and federal laws permit impact to these areas, compensate for any wetland or body loss with on- or off-site mitigation of equal or greater amounts. Limit impact to high quality wetlands and water bodies to 20% of their extent on site.	5	3
			3	Site is adjacent to existing communities or in an area that does not excessively contribute to the use of automobiles for daily trips.	8	3
	4		Site is within walking distance of existing necessary retail and community services.	2	4	
Location Totals					20	10

Relevant Guiding Principles:

1. Create a range of housing types and affordable price levels.
2. Foster distinctive, attractive communities with a strong sense of place.
- 3. Encourage developments that strengthen existing communities.**
- 4. Mix land uses.**
- 5. Create walkable neighborhoods.**
6. Encourage public and private collaborations shaped by community and stakeholder participation.
7. Make development decisions predictable, fair, sustainable, and cost effective.
- 8. Preserve open space, farmland, natural beauty, and critical environmental areas.**
- 9. Consider transportation needs and encourage a variety of transportation options.**
10. Take advantage of compact building design.
- 11. Create developments with low environmental impact.**
12. Create energy efficient buildings incorporating Energy Star or greater standards.
13. Create healthy living spaces.

General Resources for Location

EPA Smart Growth

<http://www.epa.gov/dced/index.htm>

US Green Building Council LEED for Neighborhood Development Page <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=148>

National Resources Defense Council

<http://www.nrdc.org>

Urban Land Institute

<http://www.uli.org>

Mississippi Department of Marine Resources Coastal Management and Planning Office

<http://www.dmr.state.ms.us/CMP/CRMP/crpm-home.htm>

Location - Infill Development *20 required points / 10 additional points*

A1 - Site is in a developed area with added value for brownfield sites, renovation and adaptive reuse of existing buildings, previously developed sites, and other projects that reuse and revitalize existing neighborhoods.

Intent

Promote building where humans have already altered the natural environment, thereby decreasing the need to alter greenfield land.

Promote development where supporting infrastructure and amenities for a project's residents already exist, thereby reducing the need to expend energy and materials on new infrastructure and amenities.

Encourage development that places workers and customers in areas that are convenient to existing businesses and provides densities that will support new businesses.

When developers put housing on infill sites, especially sites that were previously developed, they save the community money because there is generally no public expenditure required for new infrastructure. It is much more efficient from financial, materials, and energy perspectives to build where services already exist instead of building out where new infrastructure must be installed. To qualify as infill development, the project must not be built on farmland or untouched land that serves as habitat for local plants and animals or which visitors and locals may use for recreation.

New housing in older communities also creates new opportunities for business owners: when they need to hire they have new potential employees, and they have new customers for their businesses. Businesses can use these new customers and employees to expand their operations and new businesses are encouraged to open up shop nearby to serve these people, increasing the quality of life and economic opportunity of neighborhoods.

A major barrier to developing in existing communities is that prime land has already been developed. Obsolete and damaged structures, as well as brownfield sites, are frequently found where new residential development would otherwise be profitable and beneficial for the community. Through this standard, the Guild endorses and wishes to subsidize those developers who re-use existing structures, particularly those with architectural or historic value, and developers who take on the challenge of remediating and re-using contaminated land.

Communities around the United States are using subsidy programs and regulations to promote infill development, which is especially important on the Mississippi Gulf Coast. As the Renaissance Board of Directors expressed in formulating their guiding principles, "[w]ith the devastation of Hurricane Katrina, many neighborhoods have lost large amounts of their housing stock and their providers of goods and services. The disconnected neighborhoods need to be reconnected."

Definitions

Adaptive reuse – Modification of an existing building for a use that is substantially different from the purpose intended when built. Usually developers undertake adaptive reuse projects because the building has architectural elements that are unique or uncommon in new construction, or because the structure has a historic value that is important to the community.

Brownfield – A site with the presence of environmental hazards and pollutants. These are often sites where factories and other industrial activities took place in the past but where such activities have now stopped, leaving abandoned or underutilized land. In order for developers to build new uses on the land, they must first contain or remove pollutants in compliance with federal, state, and local standards. The Mississippi Department of Environmental Quality and the United States Environmental Protection Agencies maintain lists of known brownfield sites, as well as information about funding programs designed to subsidize brownfield redevelopment.

Greenfield – A site that has not been built on before. Open space, natural habitat and farmland all fall under this category.

Infill development – A project that builds on land surrounded by other, pre-existing development. Infill development can occur on previously-developed land or on land that was previously undeveloped but which is surrounded by development. To qualify as infill for this standard, 75% of the parcels immediately abutting or within a ½ mile radius of the project boundary must be previously developed. For this definition, a road is not considered as “development” along the project boundary. Instead, consideration is given to the land use across that road from the project.

Previously developed site – A site with structures, paving, or other alterations to the natural landscape. Alterations from agriculture, forestry, or for use as a natural preserve are not included.

Remediation – The process of removing or containing environmental contamination on a development site.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Speak with realtors, urban planners, or city officials to find infill sites for development.
- Consider redeveloping a brownfield with an environmental engineer and state environmental agencies using available subsidy programs.
- Work with an architect and structural engineer to renovate, repair or carry out an adaptive reuse of architecturally unique, historically important or legally protected buildings.
- Consider a scattered-site development that builds

on many unconnected sites within an existing neighborhood.

Benefits to Developers

Complying with this standard may offer a developer:

- **Qualification for subsidies** – Many federal and state programs – including the National Park Service’s Historic Preservation Tax Incentives, and the EPA’s Brownfields Cleanup Grant – provide incentives to developers who re-use urban land and build within existing neighborhoods.
- **Lowered land costs** – Developers can often purchase brownfield property at prices that are lower than those for similar property without contamination. In some cases, the price discount in combination with government subsidy can more than cover the monetary and time costs of remediating the site.
- **Lowered infrastructure costs** – By developing along existing public roads and utility infrastructure, a project does not need to include as much privately-financed infrastructure investment as a greenfield development would.
- **Added value from nearby amenities** – Projects located in existing communities have more amenities like shopping, parks, and schools in close proximity than greenfield projects. These amenities make a project more attractive to potential homebuyers and renters, and the developer does not need to build them into his or her project.
- **Improved project marketability** – Building within existing communities allows developers to market their project using the history and assets of those communities. Adaptive reuse adds even more unique qualities and a historic building could easily become a key component of the project’s marketing.

Submission Requirements

- Project address, parcel numbers, and/or a map showing the location of the proposed development.
- Map or written program statement describing the location of the project in relation to employment opportunities, shopping, and community services.
- Results of ASTM E1903-1907 Phase II Environmental Site Assessment or documentation from local, state, or federal agencies that designates the site as a brownfield, if the project involves brownfield redevelopment.
- Letters or other documentation from an environmental

engineer and the relevant state agencies outlining the remediation plan, if the project involves brownfield redevelopment

- Program statement outlining the repair, renovation, or adaptive reuse of a structure, if such activities are part of the development.

Standards Referenced

ASTM E1903-97 Phase II Environmental Site Assessment. ASTM International: <http://www.astm.org>

Precedents

LEED-ND –

SLL Prerequisite 1: Smart Location

SLL Credit 1: Preferred Locations

SLL Credit 2: Brownfields Redevelopment

LEED NC – SS Credit 3: Brownfield Redevelopment

CNU – Principle 4

Additional Resources

Brownfields Redevelopment: A Guidebook for Local Governments and Communities, Second Edition.

<http://bookstore.icma.org>

Brownfields Technology Support Center

<http://www.brownfieldstsc.org>

EPA Land Revitalization web page

<http://www.epa.gov/oswer/landrevitalization/index.htm>

EPA Smart Growth

<http://www.epa.gov/dced/index.htm>

Mississippi Department of Environmental Quality

http://www.deq.state.ms.us/MDEQ.nsf/page/GARD_brownfields?OpenDocument

Mississippi Department of Archives and History Historic Preservation Tax Incentives

<http://mdah.state.ms.us/hpres/prestaxincent.php>

Mississippi Department of Marine Resources Coastal Management and Planning Office – The federal government has targeted certain communities or properties as priorities for investment through various initiatives. A project sited within these communities will positively influence our evaluation against standard A1.

Consult these programs to find areas that have been determined to have high priority for development and which may provide additional subsidy.

<http://www.dmr.state.ms.us/CMP/CRMP/crmp-home.htm>

EPA National Priorities List for Mississippi

<http://www.epa.gov/superfund/sites/npl/ms.htm>

HUD's Empowerment Zones, Enterprise Communities, and Renewal Communities

<http://www.hud.gov/offices/cpd/economicdevelopment/programs/rc/index.cfm>

Department of Justice Weed and Seed Program

<http://www.ojp.usdoj.gov/ccdo/ws/welcome.html>

Department of the Treasury New Markets Tax Credit Program

http://www.cdfifund.gov/what_we_do/programs_id.asp?programID=5

HUD's Low-Income Housing Tax Credit Program

<http://www.hud.gov/offices/cpd/affordablehousing/training/web/lihtc/>

Location - Non-Infill Development *5 required points / 0 additional points*

A2.1 Site does not have a primary role in maintaining the ecological function and natural beauty of the area.

Intent

Conserve land in and around important ecosystems and habitat corridors.

Preserve unique natural features as well as human access for the appreciation of these features.

The Mississippi Gulf Coast has an abundance of bayous, lakes, marshes, forests, and other assets that are unique to our climate and which attract visitors and residents from around the country. Development of all kinds, if poorly sited, can destroy these assets. Since ecologies function as integrated systems over many miles, development can be detrimental to ecological function across an area much larger than a particular site. Just as putting down asphalt on one parcel can flood neighboring property, developing one site can impact habitat and hydrology for miles around. For example, building a large subdivision in the middle of a forest corridor not only destroys the habitat on the development site, but it also divides the remaining habitat, isolating animals that live on either side of the development.

It is impossible to create an exhaustive list of places on the Mississippi Gulf Coast that would qualify as unique natural features, but examples include our many waterways and wetlands, some of which are listed under the Federal Wild and Scenic Rivers program or the Nationwide Rivers Inventory, stands of mature oak trees, or places that are important to local residents, such as popular fishing spots.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Comply with all relevant state, federal, and local laws regarding the development of coastal lands.
- Locate developments away from undisturbed habitat, especially habitat that is part of an uninterrupted ecological network, and land that is home to endangered or threatened species.
- Locate projects away from unique natural features.
- Consult the Mississippi Department of Marine Resources, the Department of Environmental Quality, the National Park Service, a qualified environmental engineer, biologist, or landscape architect if there is doubt about the importance of a site to the local ecology or natural beauty of the region.
- Consult local citizens or conservation groups such as the Land Trust for the Mississippi Coastal Plain or the Sierra Club, which can provide valuable, local knowledge of resources that state and federal agencies may not possess.

Benefits to Developers

Complying with this standard may offer a developer:

- *Reduced compliance costs* – Frequently, state and federal environmental controls are triggered after land is purchased for development, resulting in monetary and time costs. Pre-purchase investigation of a site's ecology can prevent unexpected compliance and mitigation costs later, especially when public funding is involved in a project's financing structure. Locating a project away from ecologically sensitive or unique land can also prevent public opposition that could result in monetary and time costs as well.

Submission Requirements

- Project address, parcel numbers, and/or a map showing the location of the proposed development.

Precedents

LEED ND – SLL Prerequisite 3: Imperiled Species and Ecological Communities

LEED NC – SS Credit 1: Site Selection

HUD Environmental Review Guide for Community Development Block Grant Programs

Additional Resources

Mississippi Gulf Coast National Heritage Area
<http://msgulfcoastheritage.ms.gov/CMP/home.aspx>

Mississippi Department of Environmental Quality
<http://www.deq.state.ms.us>

Mississippi Department of Marine Resources Coastal Management and Planning Office
<http://www.dmr.state.ms.us/CMP/CRMP/crmp-home.htm>

Land Trust for the Mississippi Coastal Plain
<http://www.ltmcp.org>

Sierra Club, Mississippi Chapter
<http://mississippi.sierraclub.org>

Location - Non-Infill Development *5 required points / 3 additional points*

A2.2 Site does not include wetlands, water bodies, or land within 100 feet of these areas;

-OR-

If the project site includes wetlands, water bodies, or land within 100 feet of these areas and local, state, and federal laws permit impact to these areas, compensate for any wetland or water body loss with on or off-site mitigation of equal or greater amounts. Limit impact to high quality wetlands and water bodies to 20% of their extent on site.

Intent

Conserve water quality, natural hydrology and habitat.

Preserve biodiversity through conservation of water bodies and wetlands.

The Mississippi Gulf Coast has extensive stretches of wetlands surrounding an intricate network of rivers, streams, lakes, bays, and the Mississippi Sound. Many of these waterways and wetlands are unique in the United States and are home to a variety of rare and endangered plants and animals. Wetlands provide valuable flood protection to the region during severe storms, soaking up and slowing down water from upland areas before draining it to the sea. Wetlands also naturally filter pollutants in storm runoff before it reaches rivers and oceans.

Preserving these wetlands and local water bodies is a challenge in our region because they are extensive. However it is a challenge that must be met in order to protect the wildlife and natural land that make our region attractive, to minimize the hazard to human life and property from storm events, and to maintain the quality of marine habitats downstream.

However, not all wetlands are the same; there are different levels of wetland quality in terms of hydrology, animal habitat, and connectivity to other undisturbed habitat. Biologists and the Army Corps of Engineers (which has ultimate regulatory jurisdiction over wetlands in the United States) recognize these differences and give wetlands high, medium, and low quality designations. It

is also important to note that some wetlands are actually the result of human activity, such as canal building or ditching. Because of these differences in quality, developers need to understand the kinds of wetlands on their site and respond accordingly.

While protecting as much wetland and waterway as possible is a goal of the Development Standards, impact on low-quality or isolated wetlands will be considered less detrimental than high-quality wetlands in the evaluation of a project.

Infrastructure or facilities provided for appreciation and public access to waterways and wetlands within the 100-foot buffer and within wetlands or over water bodies themselves will not count against the evaluation of the project, provided that the developer obtains the necessary permits for such construction and works with a landscape architect or engineer to design them. Examples of these kinds of facilities include:

- Bicycle and pedestrian pathways
- Facilities necessary for habitat management activities
- Low-impact structures, such as pavilions and piers
- Earthwork necessary to ensure public access
- Small clearings for tables, benches, and access for non-motorized watercraft

Definitions

Wetland – The federal government defines wetlands in the Code of Federal Regulations 40 CFR, Part 230, Section 41 as “[t]hose areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.”

High-quality wetland – A wetland area that performs well as habitat for wildlife and a variety of native, non-invasive vegetation. High quality wetlands are connected to large areas of undisturbed habitat and receive unpolluted water from surrounding land through hydrology unaltered by humans. The Army Corps of Engineers and qualified biologists determine the level of wetland quality when completing the wetland permitting process.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Consult with environmental engineers, biologists, city officials, the Mississippi Department of Marine Resources, Department of Environmental Quality, and local environmental groups to find development sites without wetlands.
- When building on a site with wetlands or water bodies work with a landscape architect, environmental engineer, planner, and/or architect to develop the site in such a way that buildings and infrastructure are clustered at least 100 feet away from wetlands and water bodies.
- If a project must impact on-site wetlands, water bodies, and nearby buffer lands, comply with all relevant local, state, and federal laws, mitigate for impact according to these laws, and impact no more than 20% of any high quality wetlands and water bodies on the site.
- Prepare on-site mitigation techniques with a landscape architect or environmental engineer that can compensate for the loss of local habitat and natural drainage. These techniques could include selling the portion of land on which the wetlands are located or establishing a conservation easement to a conservation organization or a public agency. Another option would be to create new wetlands on the site that would have equal or greater hydrologic and ecologic function than the wetlands impacted through construction.
- Build infrastructure that will provide access for the appreciation of wetlands and water bodies if the project site contains or borders them.

Benefits to Developers

Complying with this standard may offer a developer:

- **Reduced compliance costs** – Frequently, state and federal environmental controls are triggered after land is purchased for development, resulting in monetary and time costs. Pre-purchase investigation of a site's ecology can prevent unexpected compliance and mitigation costs later, especially when public funding is involved in a project's financing structure. Locating a project away from ecologically sensitive or unique land can also prevent public opposition that could result in monetary and time costs as well. Choosing a site without wetlands avoids the need to go through permitting with the Army Corps of Engineers, the Mississippi Department of Environmental Quality, and the Department of Marine Resources.
- **Lowered infrastructure costs** – If your site does include wetlands, preserving them can reduce costs associated with drainage engineering. Since wetlands act as natural drains, preserving them and incorporating them into your stormwater management plan will mean less spending on culverts, ditches, and related earthwork.
- **Added value from natural amenities** – On sites where water bodies and wetlands exist, developers can use preserved and enhanced wetlands as a selling point for buyers and renters who want to have immediate access to the unique natural habitats of the Gulf Coast.

Submission Requirements

- Army Corps of Engineers Wetlands Permit, Jurisdictional Wetlands Determination and/or consultant wetlands investigation, as well as approval letters from Mississippi Department of Environmental Quality and the Mississippi Department of Marine Resources if the project site includes wetlands.
- Site plan(s) or landscaping plan showing the types of plants, their locations, their relationships to buildings and walkways, any trees that will be preserved on the site, and irrigation systems.
- Site plan(s) showing storm water drainage patterns, storm water infrastructure, and storm water best management practices, with pre and post-development peak storm water calculations.

Standards Referenced

United States Code of Federal Regulations 40 CFR, Part 230, Section 41, which is the basis for the federal definition of wetlands. For access to the text of this code, see: http://edocket.access.gpo.gov/cfr_2008/julqtr/40cfr230.41.htm

Precedents

LEED ND –

SLL Prerequisite 4: Wetland and Water Body Conservation

SLL Credit 7: Site Design for Habitat or Wetland Conservation

SLL Credit 8: Restoration of Habitat or Wetlands

SLL Credit 9: Conservation Management of Habitat or Wetlands

LEED NC –

SS Credit 1: Site Selection

SS Credit 5.1: Site Development: Protect or Restore Habitat

Additional Resources

American Society of Landscape Architects
<http://www.asla.org>

Army Corps of Engineers, Mobile District – Has jurisdiction over wetlands permitting in George, Hancock, Harrison, Jackson, Pearl River, and Stone Counties.
<http://www.sam.usace.army.mil>

Army Corps of Engineers pamphlet, “Recognizing Wetlands: An Informational Pamphlet”
http://www.usace.army.mil/CECW/Documents/cecwo/reg/rw_bro.pdf

Mississippi Gulf Coast National Heritage Area
<http://msgulfcoastheritage.ms.gov/CMP/home.aspx>

Mississippi Department of Environmental Quality Wetlands Protection Program
http://www.deq.state.ms.us/MDEQ.nsf/page/WQCB_Steam_Wetland_Alteration03?OpenDocument

Mississippi Department of Marine Resources Coastal Management and Planning Office
<http://www.dmr.state.ms.us/CMP/CRMP/crmp-home.htm>

Land Trust for the Mississippi Coastal Plain

<http://www.ltmcp.org>

Society for Ecological Restoration International

<http://www.ser.org>

Spring Island, South Carolina – A residential development designed with the preservation and enjoyment of wetlands and waterways in mind.

<http://www.springisland-sc.com>

Location - Non-Infill Development *8 required points / 6 additional points*

A2.3 Site is adjacent to existing communities or in an area that does not excessively contribute to the use of automobiles for daily trips.

Intent

Reduce automobile dependency and support alternative modes of transportation.

Strengthen existing neighborhoods and businesses by encouraging development near urban areas, and limit the need for developing virgin or agricultural land.

The cost of housing is more than the purchase price or monthly rent. A house or apartment that has a low mortgage or rent cost might seem affordable, but when it is a long distance from the daily necessities of life, gasoline prices can affect that affordability. The additional cost of maintaining multiple cars for one family is an added long-term, fixed expense. The financial burden of driving long distances will only increase as national and international agreements restrict the amount of carbon dioxide that automobiles can release into the atmosphere.

Long commutes and automobile trips for necessary errands also contribute to sedentary lifestyles and poor health, a problem that is particularly acute in Mississippi. Although the Mississippi Gulf Coast is not fortunate enough to have an extensive public transportation system or a compact development patterns that would making driving unnecessary for most people, it is still possible to develop in areas where the need to drive is minimized.

Locating new development around existing communities also keeps communities and businesses vital. The most critical issue facing the Mississippi Gulf Coast's future is the availability of affordable, safe, attractive housing for the region's workforce that is within a reasonable distance of their workplace; without this, the Coast's economic opportunity for growth and prosperity will not be realized. While it may not be possible to provide all of the Gulf Coast's growing population with housing on infill sites, this standard encourages developers to site their projects on land that is close to existing communities.

See Figures A2.1 and A2.2 below to see the distribution of VMT and population density in the region.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Locate projects at the edge of existing development within close proximity of large job centers and essential services, especially if the project itself will contain a large number of homes.
- Avoid development sites in the middle of agricultural land or forest.

Submission Requirements

Project address, parcel numbers, and/or a map showing the location of the proposed development.

Standards Referenced

US Census Bureau, Census 2000 Urban and Rural Classification:

http://www.census.gov/geo/www/ua/ua_2k.html

Precedents

LEED ND –

SLL Prerequisite 1: Smart Location

SLL Credit 1: Preferred Locations

SLL Credit 3: Reduced Automobile Dependence

SLL Credit 5: Housing and Jobs Proximity

Additional Resources

Gulf Coast Regional Planning Commission

<http://www.grpc.com>

National Household Transportation Survey (NHTS)
Transferability Home

<http://nhts-gis.ornl.gov/transferability/Default.aspx>

US Census Bureau information on population densities through American FactFinder

<http://factfinder.census.gov>

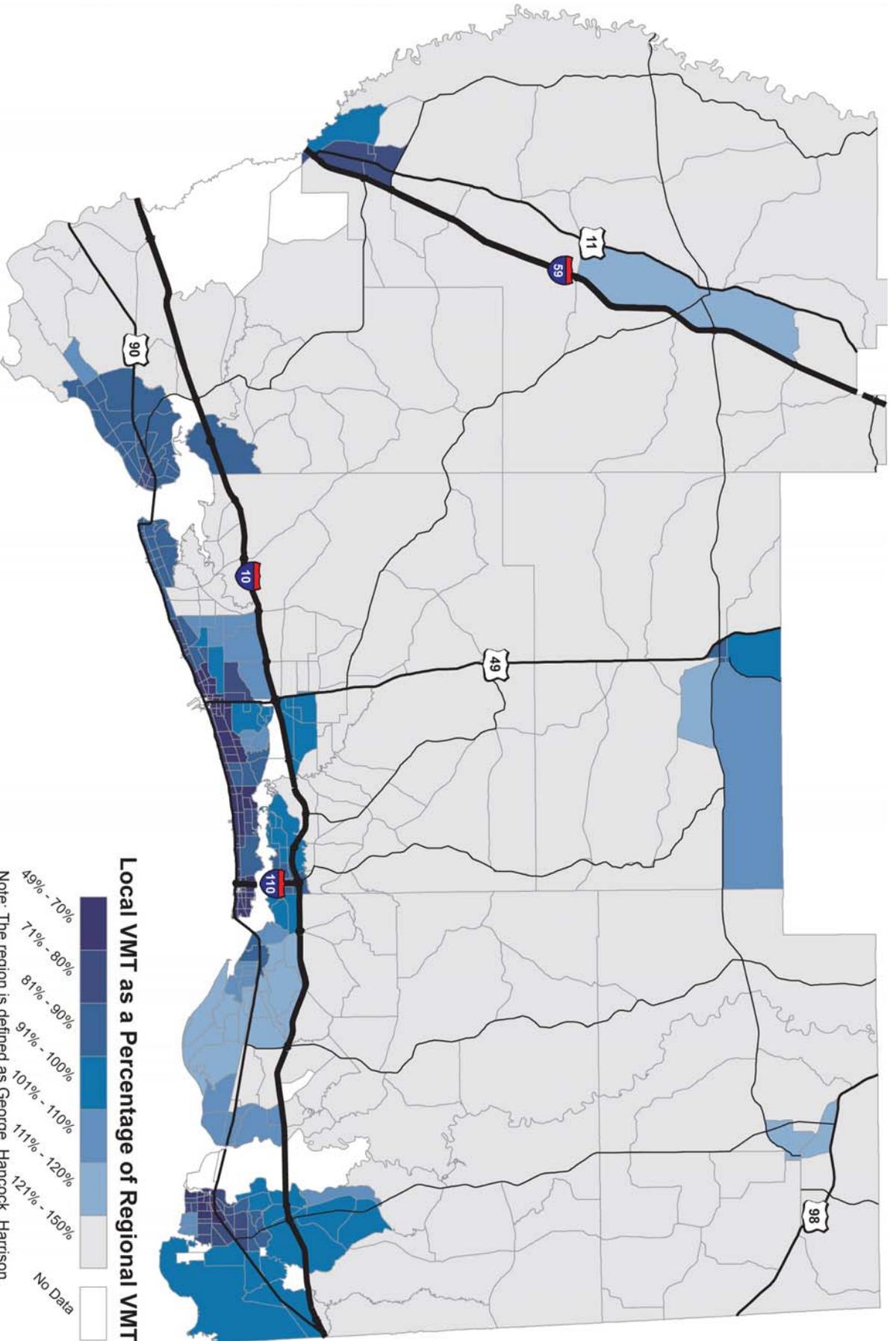
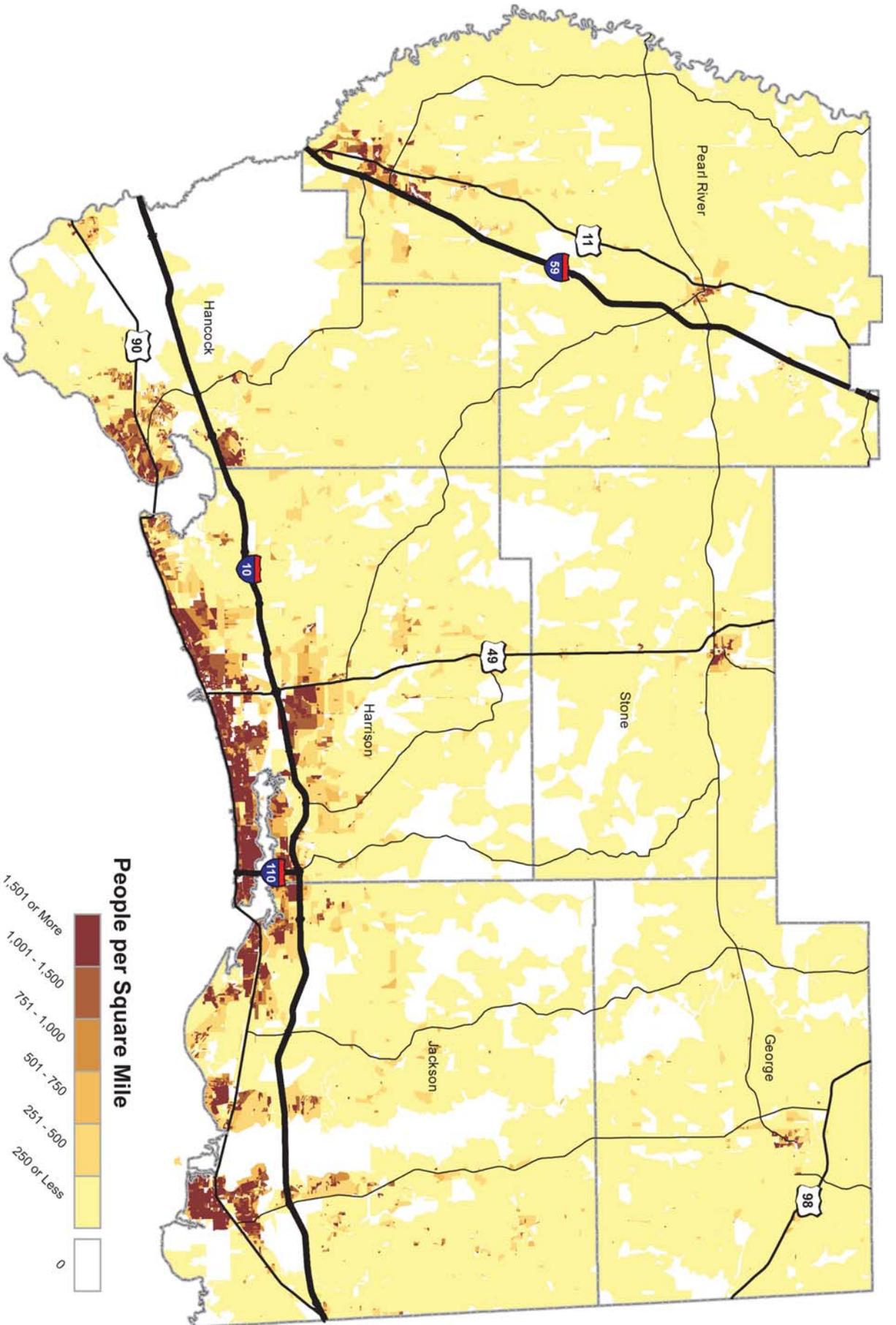


Figure A2.1
Relative Automobile Dependency within the Region



Sources: Census 2000; MARIS

Figure A2.2
Population Density within the Region

Location - Non-Infill Development *2 required points / 4 additional points*

A2.4 Site is within walking distance of existing necessary retail and community services.

Intent

Reduce automobile dependency and support alternative modes of transportation.

Reduce the risk of obesity, heart disease, and hypertension by encouraging daily physical activity associated with alternative modes of transportation and compact development.

Much of the new development on the Mississippi Gulf Coast and around the country is laid out in such a way that one must drive in order to complete even basic tasks, such as picking up a prescription from a pharmacy, dropping off clothes at the dry cleaner, or going to a convenience store to get a gallon of milk between trips to the grocery store. The Guild encourages development that puts people's homes near the services that they need so that less driving is necessary. With less driving, families can devote more time to other activities, and making routine trips on foot provides more opportunities for physical activity and exercise which can improve health.

The general rule of thumb in urban planning practice is that a service is within "walking distance" of a project if

it is less than a half-mile away, as this is the distance that can be covered in about 10 minutes by most healthy people. However, the quality of the walk from a home to a service is important as well. For example, if a project is located a ¼ mile from a shopping plaza with many essential services but getting to that shopping plaza requires a lengthy detour around a highway onramp or walking along a high-speed road without sidewalks it is not considered within a realistic walking distance. On the other hand, if a project is located one mile away from a similar shopping plaza, but the route to that plaza has continuous sidewalks, shady trees, or some sort of pedestrian trail, then the project may be considered within walking distance of these essential services.

Definitions

Necessary retail and community services – The following qualify:

Retail

- Convenience store
- Florist
- Hardware store
- Pharmacy
- Supermarket
- Other retail

Services

- Bank
- Coffee shop
- Hair care
- Health club
- Laundry/dry cleaner
- Medical/dental office
- Restaurant
- Homeless shelter

Civic/Community Facilities

- Child care (licensed)
- Civic/community center
- Place of worship in a building
- Police/fire station
- Post office
- Public library
- Public park
- School
- Senior care
- Social services facility

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Select development sites near retail and community services. Consult web-based tools like Google Maps or Walk Score to get a rough sense of where existing services are located.

Benefits to Developers

Complying with this standard may offer a developer:

- *Added value from nearby amenities* – Projects located in existing communities have more amenities like shopping, parks, and schools in close proximity than greenfield projects. These amenities make a project more attractive to potential homebuyers and renters and reduce the need for including such amenities on site.
- *Improved project marketability* – Building within existing communities allows developers to market their project using the history and assets of those communities. Adaptive reuse adds even more unique qualities and a historic building could easily become a key component of the project's marketing.

Submission Requirements

- Project address, parcel numbers, and/or a map showing the location of the proposed development.
- Map or written program statement describing the location of the project in relation to employment opportunities, shopping, and community services.

Precedents

LEED ND – SLL Prerequisite 1: Smart Location

LEED NC – SS Credit 2: Development Density & Community Connectivity

Additional Resources

Google Maps

<http://maps.google.com>

Walk Score

<http://www.walkscore.com>

Program Category

Introduction

A successful development project meets the needs of the surrounding community and has the support of local residents. Input from community members and research about their needs are important to determine project programming, amenities, and location. Community plans and municipal comprehensive plans developed with input from local community members should be consulted to determine the appropriateness of the proposed development within the local long-term land use plan. Additionally, developers are encouraged to directly solicit community participation to obtain input on and promote public awareness of developments.

In addition, the development should enhance and positively integrate into the existing community. Developers are encouraged to use market studies and community surveys to determine the need for housing and services for the area. A strong program should reach beyond the boundaries of property lines, and incorporate or enhance functions and amenities within the community.

Category	Criteria	Standard	Required Points	Additional Points
Program Ensures that the project is both compatible with and needed by the community.	B Community involvement	1 Program is compatible with local long-term land use planning, with added points given for projects that are identified by the community to be necessary to the economic, social, and environmental improvement of the area.	2	3
		2 Program is publicized through an outreach strategy that educates and informs community members about the uses of the project and its design.	3	2
		3 Local community-based organizations are involved in the planning of the project.		5
	C Neighborhood housing choices	1 Program increases the range of housing types, in terms of ownership and/or density, with added value for innovative housing types.	5	5
		2 Program increases the number of affordable units within 1/2 mile radius with added value for mixed-income projects.	5	5
	D Neighborhood services	1 Program either includes on site or within walking distance of services such as necessary shopping, playgrounds, public open spaces, community services and	5	5
	Program Totals			20

Relevant Guiding Principles:

1. Create a range of housing types and affordable price levels.
2. Foster distinctive, attractive communities with a strong sense of place.
3. Encourage developments that strengthen existing communities.
4. Mix land uses.
5. Create walkable neighborhoods.
6. Encourage public and private collaborations shaped by community and stakeholder participation.
7. Make development decisions predictable, fair, sustainable, and cost effective.
8. Preserve open space, farmland, natural beauty, and critical environmental areas.
9. Consider transportation needs and encourage a variety of transportation options.
10. Take advantage of compact building design.
11. Create developments with low environmental impact.
12. Create energy efficient buildings incorporating Energy Star or greater standards.
13. Create healthy living spaces.

Program - Community Involvement *2 required points / 3 additional points*

B1 Program is compatible with local long-term land use planning, with added points given for projects that are identified by the community to be necessary to the economic, social, and environmental improvement of the area.

Intent

Ensure that new development fits within the community's plan for future change.

Prevent wasteful infrastructure spending.

Create high-quality neighborhoods that can support a range of amenities and services.

Municipalities, counties, neighborhoods, and regions undertake planning studies in order to understand the current state of their communities and the ways in which populations and economies are likely to change over subsequent years. Planning studies also provide everyday citizens with the opportunity to voice concerns and offer solutions to issues in their neighborhoods, cities, and regions. These studies set goals for change and are the basis for infrastructure spending, land use regulation, and other policies that will shape the private land market to serve that change.

When private development follows long-term plans, communities can provide supporting infrastructure more efficiently, preserve land for open space, and ensure growth in amenities like retail and public transportation that depend on certain densities. By following long-term plans, developers may also help prevent the over- and under-building that chronically plagues land markets and which has negatively impacted the Gulf Coast region in recent years with sharp swings in prices and high vacancy. Planning documents and planning departments can also be valuable sources of information about a community's desires for change, possible incentives for building in certain areas, and the challenges that may make building in other areas unfeasible.

In addition to the planning documents produced by governments, quasi-governmental organizations, and non-profits,

Definitions

Comprehensive Plan – A document created by a community, city, county, or other local government entity that typically lays out future land use, transportation, and other infrastructure investment in that community.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Meet with the planning officials for the municipality or county that has jurisdiction over the project, and discuss the plans that have been set into place for the location that has been chosen for the project.
- Use new or existing market research to drive development decisions.

Benefits to Developers

Complying with this standard may offer a developer:

- *Regulatory and community approval* – Gaining community buy-in and local support can be helpful during planning commission reviews and other public hearings. The overall success of the project will be more probable if it has the support of community members.

Submission Requirements

- Program statement that clearly defines the proposed housing types, the number of units, the cost (to the user and the developer), the building uses, accessibility to those buildings, and any services that are within walking distance of the proposed development or included in the design of the development.
- Research reflecting the feasibility and necessity (economic, social, and environmental) of the project, if any.

Precedents

CNU – Principle 4, Principle 5, Principle 9

Getting to Smart Growth – Principle 7: Strengthen and Direct Development toward Existing Communities

LEED ND – SLL Prerequisite 1: Smart Location
SSL Credit 1: Preferred Locations

NPD Prerequisite 3: Connected and Open Community

NPD SSL Credit 4: Mixed-Income Diverse Communities

NPD Prerequisite 9: Access to Public Spaces

Program - Community Involvement *3 required points / 2 additional points*

B2 Program is publicized through an outreach strategy that educates and informs community members about the uses of the project and its design.

Intent

Encourage the inclusion of input from community members during project development.

Promote public awareness about development within the community.

Community members should be informed of proposed projects and given opportunity to comment on them. This will help create a product that is integrated within the community and creates a positive impact on surrounding neighborhoods. Open communication with community members is an effective way to determine neighborhood features that could be preserved or highlighted in a new development. Communication may also reveal programmatic voids within a community that could be filled by a new project, thus further generating community support. Although it is not possible to list the myriad factors that can influence the programming, location, and amenities of a project, considerations that come directly from community members are likely to be some of the most appropriate factors to integrate into a project. Giving community members the opportunity to comment on proposed projects can create products that are integrated within the community and maintain a positive impact on surrounding neighborhoods.

Projects that seek input from community members benefit in terms of quality and appropriateness, as well as in the investment that the community has put forth. If local residents have been a part of the input process during design phases of a project, they will likely take greater pride and ownership of a development, once completed. Community investment is perhaps the most critical factor in determining a project's lasting success, and open communication early in the design process is the most straightforward way to gain it.

Without community input, projects face a more difficult path in obtaining local approvals. In addition, the development may cause negative impressions on surrounding community members, generating ill will towards the project and potentially its new residents. More drastically, projects that do not address community needs may find it difficult to fully rent out or sell the units.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Use one or more of the following (or similar) strategies to inform local community members;
- Hold public meetings within the community. Invite community members to gather at a specific place and time to hear about the project and to have a chance to ask questions. This is a preferred time to collect feedback from the community about the proposal. Consider holding meetings in the evening or at times that accommodate community members' schedules. If possible, consider providing childcare at the meeting.
- Utilize direct mailing of fliers or letters to local neighborhoods. Send out published media with images and text describing the proposal and include contact information so that the community members are able to ask questions and give feedback about the project.
- Create a website that describes the project or post visible information that is accessible by the public on site.
- Survey community members directly to determine existing neighborhoods' positive characteristics and possible routes to address negative qualities
- Meet with community leaders; talk with pastors,

teachers, directors of community organizations, and others in positions of community leadership

- Ensure that the information that is being distributed is accessible to the community at large. In particular, be sensitive to the different languages within the community. The information that is being distributed might need to be translated and presented in multiple languages.

Benefits to Developers

Complying with this standard may offer a developer:

- *Regulatory and community approval* – Gaining community buy-in and local support can be helpful during planning commission reviews and other public hearings. The overall success of the project will be more probable if it has the support of community members. Local organizations are likely to have information on what community needs are not being met, including what groups are most in need of housing, which families would qualify to rent or purchase units in the development, and what issues are most likely to be important to residents.

Submission Requirements

- Applicable documentation will vary based on the means by which the development is publicized; this could include printed information that was distributed, publicity statements, public meeting announcements, copies of mailing distribution lists, dates of public meetings or pictures from input meetings.

Precedents

Getting to Smart Growth – Principle 5: Make Development Decisions Predictable, Fair, Sustainable, and Cost Effective

Principle 10: Encourage community and stakeholder collaboration in development decisions.

LEED ND – NPD Credit 12: Community Outreach and Involvement

Program - Community Involvement *0 required points / 5 additional points*

B3 Local, community-based organizations are involved in the planning of the project

Intent

Promote the public's interest within the planning of the project.

Partnering with a local organization can benefit the project in many ways. It ensures that the community has a voice within the project in a more consistent manner than relying solely on input from public meetings. The community partner can help align the agenda of the developer and that of the community.

The community partner may take on various roles during project development ranging from community mediation to local marketing outreach. The partner will likely have a good idea of the most appropriate role to take based on existing knowledge of the community and its unique characteristics.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Identify the community-based organizations that are best positioned to improve the project and move it forward. Solicit their input as a partner organization.
- Determine how each of the community organizations will be able to help the project and work with them to determine parameters for the development.
- Find an organization that will help to promote the project as well as the agenda of the community.

Benefits to Developers

Complying with this standard may offer a developer:

- *Larger funding network* – Partnering with local organizations has the possibility of tapping into their local or regional networks and gaining resources or funding sources that would otherwise be unavailable or unknown.
- *Regulatory and community approval* – Gaining community buy-in and local support can be helpful during planning commission reviews and other public hearings. The overall success of the project will be more probable if it has the support of community members. Local organizations are likely to have information on what community needs are not being met, including what groups are most in need of housing, which families would qualify to rent or

purchase units in the development, and what issues are most likely to be important to residents.

Submission Requirements

- Evidence of involvement with community-based organizations (letters of endorsement, list of people or organizations involved in the planning of the project) beyond local planning commissions and city councils, if any.

Precedents

Getting to Smart Growth – Principle 10: Encourage Community and Stakeholder Collaboration in Development Decisions.

LEED ND – NPD Credit 12: Community Outreach and Involvement

Program - Neighborhood Housing Choices *5 required points / 5 additional points*

C1 - Program increases the range of housing types within a 1/2 mile radius, in terms of ownership and/or density, with added value for innovative housing types.

Intent

To promote diversity in age, economic level, and household size within the community.

Increasing the range of housing options accommodates the needs of a diverse group of people within the community. With a mixed range of housing types, more people and families are able to find housing that meets their needs. Families who rent will be able to remain in their neighborhood when they build up enough assets to purchase a home. Elderly individuals will be able to remain close to their neighbors once their children leave home and they need less space. In addition, segregation of income groups is avoided, thus preventing the creation of marginalized communities. In affordable housing, it is particularly important to allow for a mix of incomes and opportunities so that the most vulnerable groups, such as the very poor and the elderly, are not isolated.

Diversity of ownership types within developments encourages social equality within the neighborhood, and keeps the neighborhood from becoming economically or socially segregated.

Smaller units that have only one or two bedrooms allow for single occupants (such as the elderly or young couples) or small families to afford to rent or buy the unit. Larger units of three or four bedrooms will serve larger families.

Implementation

To achieve this, the project needs to include housing types that cater to a range of family sizes and types, and ranges of affordability. The following list provides common examples of housing types that are encouraged, although the developer may choose housing types that do not appear on this list.

- Detached Single-family Residential – A building that contains one single-family housing unit. This is most commonly referred to as a single-family home. These are very flexible in terms of the household sizes they accommodate, and can contain one bedroom or several.
- Duplex – A building that contains two single family housing units, either side by side or stacked – also referred to as Semi-Detached. These can also range in size from one bedroom to multiple bedrooms.
- Townhouse – A series of several adjacent housing units. These may be identical units that are repeated, or they may be different, allowing for a range of household sizes to be accommodated. Units may also be stacked vertically within a townhouse. For example, a smaller one-bedroom unit may sit below a larger three-bedroom unit, with each unit accessing an entry directly from the street.
- Live/Work- A building containing single or multiple units, each of which allows for both residential and commercial use. Commercial uses allowed in live/work spaces may be limited to retail or professional services, or other uses that do not create unacceptable levels of noise, odor, etc. in neighboring residential units.
- Mixed Use – Within the same building or groups of buildings, a range of programmatic uses, most often but not limited to residential and commercial uses, are provided.
- Single Room Occupancy (SRO) – A multi-tenant building housing one or two people per bedroom, sometimes with a kitchenette and bathroom within the room. The tenants often share a communal kitchen and bathrooms, and common spaces and support services are typically provided. SROs are typically transitional housing or address the need for housing

in vulnerable populations and those with few housing options available.

- Accessory Dwelling Unit (ADU) – An accessory unit is a smaller, secondary unit located on the same property as a primary unit, which is typically a single-family, detached house. Typically the size of accessory dwelling units is limited by code (a maximum of 750 square feet is typical), and they can take the form of a second unit within the house, a small detached building, or an apartment above a garage or other outbuilding. The secondary unit may be rented out to generate income for the owner, and provides housing diversity within a neighborhood.
- Apartments / Condos – Buildings that consist of several units that are either rented by tenants or sold individually to owner/operators. These building types often have shared amenities such as common areas, pools, and/or gyms that are accessible to residents

A mix of ownership structure is also encouraged. The following list of ownership types is not exhaustive and additional modes that don't appear on this list are also supported.

- For Sale – The unit is sold outright to the resident. The sale may include the unit and the land that it sits on, as with a single family detached house, or it may include only the unit with shared ownership of land or other shared infrastructure, as in the case of attached units or multi-unit buildings. In this case, a condo association may be formed to manage joint property, or contracts may be drawn up between individuals with abutting units.
- Rental – The unit is rented to the resident for a monthly payment, usually for an agreed-upon length of time.
- Lease Purchase – Also known as Rent to Own. This provides an opportunity for individuals who are unable to purchase outright or who have not developed a strong credit history, to develop equity while staying in a flexible situation. This option benefits the seller of the property, who retains the property and the rent already paid if the seller decides not to buy. The option also benefits the buyer, because it allows them to build equity through rent payments
- Co-Housing – Multiple single family units with full kitchens, which are owned by individual families, that are planned in proximity to a set of shared amenities. These amenities are jointly owned, managed, and used by all of the residents.
- Examples of these amenities are pools; catering

kitchens; large dining rooms for events; workout rooms; and laundry facilities. Co-housing is benefits residents both socially, by increasing interaction between neighbors, and economically, by allowing access to facilities that individual families could not afford.

Benefits to Developers

Complying with this standard may offer a developer:

- *Expanded markets* – Creating a range of housing types expands the market to more families of various types and meets a greater range of housing needs. From the developer's standpoint, the diversity of units means a larger pool of potential customers.
- *Improved project marketability* – A range of housing types creates a sense of an established community, providing an attractive, culturally diverse environment, which appeals to many people.

Submission Requirements

Program statement that clearly defines the proposed housing types, the number of units, the ownership structure, the cost (to the user and the developer), the building uses, accessibility to those buildings, and any services that are within walking distance of the proposed development or included in the design of the development.

Precedents

CNU –

Principle 7

Principle 13

LEED ND – NPD Credit 4: Mixed-Income Diverse Communities

Getting to Smart Growth – Principle 3: Create a Range of Housing Opportunities and Choices.

Program - Neighborhood Housing Choices *5 required points / 5 additional points*

C2 - Program increases the number of affordable units within a 1/2 mile radius with added value for mixed-income projects.

Intent

Create culturally rich environments.

Promote the development of mixed-income neighborhoods.

Provide equitable housing options for community members regardless of social status or economic condition.

Focusing on the development of housing for the local workforce creates housing opportunities for people in various socio-economic levels. Creating mixed-income, mixed-use communities provides opportunity for culturally rich and socially diverse environments.

Affordable housing shortages along the Gulf Coast are driving people to live away from the areas of density, and forcing some to live in sub-standard conditions. People who are in need of housing are forced to make decisions based on the available housing stock as well as their financial situations. If they do not want to jeopardize their family's safety, they might choose a housing solution that costs more than they can afford, placing themselves in a difficult financial situation. That person might also choose to move further away from their desired geographic area, contributing to urban sprawl and leaving them far from their work, their community, and the availability of community services such as schools, libraries, churches, and grocery stores. This could reduce their housing cost initially, but in the long run could result in higher monthly household expenses due to the cost of automobile travel.

The U.S. Department of Housing and Urban Development (HUD) is the official source for information on median household income calculated both for counties and metropolitan statistical areas. Affordable housing is generally housing that begins to meet the needs of people who earn 120% or less of area median income (AMI). On the Gulf Coast, regional market studies have shown an immense need for affordable housing for households earning 40% or less of AMI.

Definitions

Area Median Income (AMI) – represents the middle point of area household incomes. Affordable housing programs and projects typically target families who make a certain percentage of the AMI.

Mixed-Income neighborhoods – Areas in which housing options are available for residents whom earn a variety of incomes.

Workforce Housing – Housing that aims to satisfy the housing needs of family households earning less than 120% AMI in a given Metropolitan Statistical Area.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Work with an experienced architect to create various housing options that address regional needs for affordability. Consider creating a mix of housing types that will be targeted to residents at various income levels.
- Define number of units per household income bracket, and determine the sale prices or rent levels for each, early in the design process to avoid budget overruns and major changes later in the process.
- Work with HUD to accept Section 8 Vouchers for affordable rental housing.

- Comply with HUD standards to ensure that housing is safe, livable, and comfortable.

Benefits to Developers

Complying with this standard may offer a developer:

- *Qualification for subsidies* – Various grants and subsidies are available to affordable housing developments- see Additional Resources section for more information

Submission Requirements

Program statement that clearly defines the proposed housing types, the number of units, the ownership structure, the cost (to the user and the developer), the building uses, accessibility to those buildings, and any services that are within walking distance of the proposed development or included in the design of the development.

Precedents

CNU – Principle 7
Principle 13

LEED ND – NPD Credit 4: Mixed-Income Diverse Communities

Getting to Smart Growth – Principle 3: Create a Range of Housing Opportunities and Choices

Additional Resources

Mississippi Housing Recovery Data Project

<http://www.smpdd.com/data-center/mississippi-housing-data-project.html>

USDA Rural Development – Offers a wide variety of support including grants and loans. Also provides information specifically for Developers about their programs.

<http://www.rurdev.usda.gov/rhs/index.html>

US Department of Housing and Urban Development – Offers a wide variety of support including grants and loans <http://www.hud.gov/>

Mississippi Home Corporation – Offers information about Low Income Housing Tax Credits

<http://www.mshomecorp.com>

HUD-Calculated Income Limits

<http://www.huduser.org/datasets/il.html>

Program - Neighborhood Services *5 required points / 5 additional points*

D1 - Program includes on site, or is within walking distance of, services such as necessary shopping, playgrounds, public open spaces, community services, and public transportation.

Intent

Create a walkable environment and connect communities with amenities and community services near by.

Reduce automobile dependency and support alternative modes of transportation.

Reduce the risk of obesity, heart disease, and hypertension by encouraging physical activity associated with alternative modes of transportation and compact development.

Create venues that encourage social interaction between residents to create stronger, more connected neighborhoods.

With the increased cost of owning and operating an automobile, the value of community services within walking distance is high. Much of the new development on the Mississippi Gulf Coast and around the country is laid out in such a way that one must drive in order to complete even basic tasks, such as picking up a prescription from a pharmacy, dropping off clothes at the dry cleaner, or going to a convenience store to get a gallon of milk between trips to the grocery store. The Development Standards reward development that puts people's homes near the services that they need so that less driving is necessary. With less driving, families can devote more time to other activities, and making routine trips on foot provides more opportunities for physical activity and exercise which can improve health.

Communities that provide destinations within walking and biking distance encourage physical activity, which can reduce the risk of obesity, heart disease, and hypertension. According a report by the Center for Disease Control in 2007, Mississippi residents had the highest rate of obesity in the United States with 32% of the population being obese. In the same study, they report that 32.5% of the population does not exercise regularly. Providing services within walking distance from developments encourages physical activity rather than reliance on automobile transit.

Creating neighborhoods that have specific venues or destinations within walking distance also encourages social interaction between the residents and creates stronger and more connected neighborhoods. Social scientists believe that social capital, in which community members begin to form deep relationships through small social interactions, can be the solution to many of a community's problems. Increasing communication and neighborhood interaction can provide an effective way to create a strong social network that can reduce crime and help community members in times of need.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Assess the area to determine what necessary services already exist, and which are needed. Consult web-based programs such as Google Maps or Walkscore to get a sense of existing services.
- Consider including needed services in your

development plan, or solicit specific businesses to develop locations within or in close proximity to the development.

- If the area surrounding the development does not have the necessary community services available, incorporate them into the plan for the new development. In some cases this may require changes in zoning, or conditional use allowances.
- Public parks are strongly encouraged and should

be put in locations that are accessible to as many neighborhood residents as possible. They should also be located in areas with high visibility from residential units.

Benefits to Developers

Complying with this standard may offer a developer:

- *Added value from nearby amenities* – Projects located in areas with amenities like shopping, parks, and schools in close proximity make a project more attractive to potential homebuyers and renters and reduce the need for including such amenities on site.

Submission Requirements

- Location of project (project address, parcel numbers, or a map showing the location of the proposed development).
-
- Map or written program statement describing the location of the project in relation to employment opportunities, shopping, and community services.

Precedents

CNU – Principle 8
Principle 11
Principle 12

Getting to Smart Growth – Principle 4: Create Walkable Communities

Additional Resources

Centers for Disease control and Prevention: Obesity and Overweight Data and Statistics

<http://www.cdc.gov/obesity/data/trends.html>

Site Design Category

Introduction

Site design is an important factor in the development of a successful project; the purpose of this section is to encourage developers to maintain and enhance the unique characteristics of their sites in development plans. Each criterion addresses both functional and aesthetic aspects that greatly affect a development's overall community health, safety, beauty, and level of social activity.

Category	Criteria	Standard	Required Points	Additional Points		
Site Design Guides site design toward the unique qualities of each development. Each criteria addresses both functional and aesthetic aspects that greatly affect a development's overall community health, safety, beauty, and social activity.	E	Street design	1	New streets in large developments integrate with existing street patterns and create a safe, pedestrian-oriented environment.	4	2
	F	Open space	1	Site plan preserves or creates vegetated open space that is appropriate to meet the program needs, with a minimum open space area of 20% of the total site area, unless more is required by local codes.	4	2
			2	Vegetation functions to shade buildings and the pedestrian environment.		3
			3	Plants used are noninvasive natives or cultivars that are adapted to the local climate.		3
	G	Parking	1	Number of parking spaces does not exceed the minimum zoning requirement. Additional points will be given for designs that reduce the number of parking spaces required and meet the neighborhood parking needs by receiving a zoning variance.	4	2
			2	Parking areas are compact and compatible with the overall project design.		3
	H	Stormwater	1	Site stormwater is managed to maintain peak discharge rate at the site's pre-development rate.	4	2
			2	Site stormwater is managed to reduce peak discharge rate through the use of EPA Best Management Practices thus reducing discharge rates, erosion, and the build-up of silt and pollutants.		3
	I	Sidewalks	1	Site plan encourages walking along the public streets by providing continuous, accessible, appropriately lit, frequently shaded sidewalks, and creates a handicap-accessible route from the sidewalk to the entrance of every public building.	4	2
	Site Design Totals			20	20	

Relevant Guiding Principles:

1. Create a range of housing types and affordable price levels.
2. Foster distinctive, attractive communities with a strong sense of place.
3. Encourage developments that strengthen existing communities.
4. Mix land uses.
5. Create walkable neighborhoods.
6. Encourage public and private collaborations shaped by community and stakeholder participation.
- 7. Make development decisions predictable, fair, sustainable, and cost effective.**
8. Preserve open space, farmland, natural beauty, and critical environmental areas.
9. Consider transportation needs and encourage a variety of transportation options.
- 10. Take advantage of compact building design.**
- 11. Create developments with low environmental impact.**
- 12. Create energy efficient buildings incorporating Energy Star or greater standards.**
- 13. Create healthy living spaces.**

General Resources for Site Design

EPA Stormwater Best Management Practices

<http://cfpub.epa.gov/npdes/stormwater/men-uofBMPs/index.cfm>

Mississippi State Extension Service, Sustainable Landscapes and Gardens

<http://msucare.com/lawn/landscape/sustainable/index.html>

Site Design - Street Design *4 required points / 2 additional points*

E1 - New streets in large developments integrate with existing street patterns and create safe, pedestrian-oriented environments.

Intent

Create developments that residents and visitors can conveniently access by foot and car from surrounding neighborhoods.

Create neighborhoods where people can travel safely on foot and other non-motorized forms of transportation.

Street design in new developments should serve automotive, pedestrian, as well as bicycle traffic. Many residential developments constructed around the coast and the nation in recent decades have few access points from surrounding streets. While this street design strategy creates the impression of security and privacy for residents, it also funnels traffic to a limited number of collector streets, potentially increasing congestion at peak periods, and making pedestrian access less convenient. This street pattern can actually encourage crime, since it reduces traffic that might discourage criminal activity.

This standard encourages developments to integrate project streets with adjacent streets as much as practical in order to increase accessibility for automobiles and pedestrians, as well as to reduce congestion. This means, to the extent possible, aligning new streets as continuations of existing streets. Wetlands or other unique green space that should not be paved over would be a reasonable barrier to creating a connection between new development and existing streets. Furthermore, connections between existing streets and new development should occur where road types are similar. In other words, a main collector street within a development should not intersect with a minor existing road as this could overwhelm the existing road's capacity. However, connecting a side street with a minor existing street could be appropriate.

Streets should not be wider than minimally required by local codes. Street width is dictated in large part by how fast the designer wants vehicles to travel on it; the greater the desired speed, the greater the width, as drivers feel more comfortable driving at higher speeds on wider roads, and because the extra width provides room to make course corrections at high speed without crashing. Unfortunately, many streets have design speeds that are higher than the posted or desired speed limit, which encourages drivers to travel faster, reducing the real and perceived safety of roads for cyclists and pedestrians, even if sidewalks are present.

Traffic calming techniques—including bump-outs at intersections, on-street parallel parking, and paving changes at crosswalks, amongst others—can also help reduce automobile traffic speeds when necessary.

Definitions

Design Speed – The intended velocity for automobiles travelling on a road. In the traffic planning and engineering professions this speed is a key criterion in the physical design of roads as wider streets allow for high velocities and narrow streets restrict velocity. Note that design speeds can be different from the legal speed limit or the speed at which drivers actually travel.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Work with civil engineer, urban planner, and/or local public works and planning departments to analyze the street pattern around the development site. Use the results of this analysis to design the development's

street pattern so that it has an appropriate number of connections.

- Design the development's streets with a clear hierarchy of street types, carefully considered design speeds, and widths that integrate with surrounding streets.

Submission Requirements

- Location of project (project address, parcel numbers, or a map showing the location of the proposed development).
- Site plan(s) showing street patterns, sidewalks, building footprints and their relationship to the street and neighboring parcels, driveways, paving, and exterior lighting.

Precedents

LEED ND –

NPD Prerequisite 3: Connected and Open Community

NPD Credit 6: Street Network

Site Design - Open Space *4 required points / 3 additional points*

F1 - Site plan preserves or creates vegetated open space that is appropriate to meet the program needs, with a minimum open space area of 20% of the total site area, unless more is required by local codes.

Intent

Provide green space for recreation or passive enjoyment of the outdoors for project residents and visitors.

Provide habitat for animals in urban settings.

Limit the urban heat island effect.

Planted open spaces can provide visual beauty and ecological functions as well as recreational space. Their flexibility and functionality can be an environmental and economic asset to a community. Green spaces are considered desirable amenities in most communities, and can increase property value and desirability.

Developers should work with design professionals to determine how pre-development site characteristics such as grade changes, surface drainage, and existing vegetation can be incorporated into the overall development plan. For example, a community park might be located where there is a cluster of live oak trees and areas that are difficult to build on due to topography or drainage patterns could be integrated into a path system. A range of: public (a park or sidewalks), semi-public (front yards, stoops, or porches), and private (backyard or patio) open spaces should be available throughout the site, depending on the project size and location.

Green space provides a habitat for vegetation, which in turn provides a habitat for wildlife, such as birds. Green space can also minimize the urban heat island effect, increase storm water filtration, and give people a connection to the outdoors. Preserving existing topsoil, plants, and trees on the site can reduce landscaping costs for the building. A well-designed open space can dramatically increase the value of the property. Building on a smaller footprint can reduce material, infrastructure, maintenance and energy costs. Using less paving can reduce site work costs.

Definitions

Urban heat island effect – A condition where the reflection of sunlight off of paved surfaces and buildings increases the local air temperature. Meteorological studies of areas with extreme sprawl, such as metropolitan Atlanta, GA, have shown that the urban heat island effect can alter precipitation patterns.

- Plant native species in open spaces to improve their visual beauty, shade, and habitat potential.
- Coordinate storm water management system planning with open space planning so that the same space can simultaneously serve drainage, visual appeal, habitat, and recreation purposes.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Identify and mark for preservation or enhancement the areas on site that have the highest potential value as open space before beginning site work.
- Add paths, shade structures, and lighting through natural areas to improve their accessibility.

Benefits to Developers

Complying with this standard will offer a developer:

- **Lowered infrastructure costs** – By leaving in place or transplanting existing trees, shrubs and herbaceous plants and using planted or porous surfaces, developers can reduce the need for stormwater management infrastructure, which can be a significant portion of a site development budget. Topsoil can also be preserved and reused in areas designated as vegetated open space.

Submission requirements

- Site plan(s) showing street patterns, sidewalks, building footprints and their relationship to the street and neighboring parcels, driveways, parking (with dimensions), paving, and exterior lighting.
- Site plan(s) or landscaping plan showing the types of plants, their locations, their relationships to buildings and walkways, any trees that will be preserved on the site, and irrigation systems.

Precedents

LEED NC –

SS 5.1: Site Development: Protect or Restore Habitat

SS 5.2: Site Development: Maximize Open Space

F2 - Vegetation functions to shade buildings and the pedestrian environment.

Intent

Reduce the energy required to cool indoor spaces with mechanical systems.

Limit the urban heat island effect.

Shading a building with trees and other landscaping can drastically reduce energy consumption and greatly improve the comfort of indoor environments. In the coastal counties, where summer heat can be intense, shading buildings can reduce temperatures in attics, as well as heat gain through windows and walls, reducing the load on mechanical cooling systems. Shading can also filter the sunlight that passes through windows, preventing indoor glare and reducing the need for blinds. This allows residents to use natural light instead of electric lighting during the day and offers a connection to the outdoors for the people inside the building.

Shading pedestrian areas is essential for keeping them usable during hot summer months. Shading sidewalks and paths will not only make for a cooler, more pleasant walk, but also protects pedestrians from harmful UV rays. Comfortable, shaded walkways encourage residents to use them, creating more activity on the street and thereby enhancing security within the community.

In addition to shading pedestrians, well-placed vegetation should shade parking areas. Shading paved areas such as parking lots and streets can have an enormous impact on the urban heat island effect

Definitions

Urban heat island effect – A condition where the reflection of sunlight off of paved surfaces and buildings increases the local air temperature. Meteorological studies of areas with extreme sprawl, such as metropolitan Atlanta, GA, have shown that the urban heat island effect can alter precipitation patterns.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Plant trees near houses such that when they grow to maturity they provide shade. The most important sides of a building to shade are the south and the west where windows have the highest potential for solar heat gain, but planting trees that will give shade on any side of the house will provide benefits.
- Plant deciduous trees, which lose their leaves in winter and thus allow sunlight to pass through windows and reduce the need for mechanical heat.
- Plant trees and other vegetation to shade exterior

areas that people will frequently use, such as patios, porches, sidewalks, and parking areas.

Submission Requirements

- Site plan(s) or landscaping plan showing the types of plants, their locations, their relationships to buildings and walkways, any trees that will be preserved on the site, and irrigation systems.

Precedents

LEED ND – NPD Credit 14: Tree-Lined and Shaded Streets

Site Design - Open Space 0 required points / 3 additional points

F3 - Plants used are non-invasive natives or cultivars that are adapted to the local climate.

Intent

Protect and strengthen native ecological systems.

Reduce water consumption for irrigation.

It is important to avoid using invasive species when landscaping. Invasive species, even if planted in isolated areas, can spread by means beyond human control (i.e. wind, birds, and insects) and harm native and locally adapted vegetation. While often beautiful, invasive species grow rapidly and crowd out native plants that are essential to providing healthy habitats and balanced ecosystems. Native species generally need less water for irrigation, since they are adapted to the local climate.

To help developers and residents control the spread of invasive species the Mississippi State University Cooperative Extension Service and the Land Trust for the Mississippi Coastal Plain maintain lists of native plant species as well as lists of invasive species that should be avoided.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Use only native species or non-invasive cultivars that are well suited for the climate in which they will be planted.
- Consult a landscape architect when developing a planting plan. A landscape architect can create a planting plan that calls for native species or non-invasive cultivars that will grow well on site and will not require extensive irrigation.
- Preserve existing plants and trees on site.

Benefits to Developers

Complying with this standard will offer a developer:

- *Lowered infrastructure and maintenance costs* – Native species generally require less irrigation which means little or no irrigation infrastructure is required. Using existing trees can further reduce the cost of landscaping and create a unique sense of place for the development.

Submission Requirements

Site plan(s) or landscaping plan showing the types of plants, their locations, their relationships to buildings and walkways, any trees that will be preserved on the site, and irrigation systems.

Precedents

LEED ND – SLL Credit 8: Restoration of Habitat or Wetlands

Additional Resources

Mississippi State University Cooperative Extension Service – Maintains lists of species native to Mississippi and other information about how to plant for the regional climate,

<http://www.msucares.com>

Federal Highway Administration, Roadside Use of Native Plants – Information on native plants in general and specific species lists for each state,

<http://www.fhwa.dot.gov/environment/rdsduse>

Land Trust for the Mississippi Coastal Plain – Information on native trees, including a downloadable booklet. Provides free native trees to homeowners annually.

<http://www.ltmcp.org>

EPA – Water-Efficient Landscaping Strategies

www.epa.gov/own/water-efficiency/docs/water-efficient_landscaping_508.pdf

Site Design - Parking *4 required points / 2 additional points*

G1 - The number of parking spaces does not exceed the minimum zoning requirements. Additional points will be awarded for designs that reduce the number of parking spaces required and meet the neighborhood parking needs by receiving a zoning variance.

Intent

Minimize the extent of impervious surface, such as asphalt and concrete, and create opportunities for more vegetated open space or other uses.

Minimize storm water runoff.

Residential developments are often built with more parking than is needed, providing multiple parking spaces on driveways and in garages in addition to on-street parking.

When a development paves over grass or other vegetation for parking or other construction, the ground can no longer absorb rain water. More water will then flow off the site during a storm than it did prior to development, and this water must be channeled and treated through municipal infrastructure before being discharged into the ground. This can potentially change the site ecology in undesirable ways.

Impervious surfaces do not have the ability to filter pollutants that can contaminate local soils and water bodies. In addition to minimizing paved areas, developers can use alternative paving materials that are water permeable. Permeable surfaces include unit pavers like brick or other tiles as well as pervious paving, which look and performs like more conventional paved surfaces and can withstand heavy use by vehicles. In addition, there are open unit pavers that allow grass to grow through, but that are resilient enough to withstand the weight of parked vehicles. Finally, loose materials like gravel or oyster shells work well and can provide a desirable look, particularly in beachside communities.

Parking lots also contribute significantly to the urban heat island effect.

Definitions

Impervious surfaces – Paving or coverage on a development site that does not allow water to pass through to the ground underneath. Common asphalt and concrete are examples of such surfaces.

Urban heat island effect – A condition where the reflection of sunlight off of paved surfaces and buildings increases the local air temperature. Meteorological studies of areas with extreme sprawl, such as metropolitan Atlanta, GA, have shown that the urban heat island effect can alter precipitation patterns.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Provide only the amount of parking required by local

zoning law

- Use a shared parking arrangement with the abutting properties if your project is in an area with a mix of uses.
- Use on-street parking as part of a development's parking plan and pursue necessary variances and permits if required by local law.
- Incorporate permeable surfaces into parking areas and other paved areas of the project.

Benefits to Developers

Complying with this standard will offer a developer:

- ***Lowered infrastructure costs*** – Permeable pavers can cost more than conventional paving, but can lead to an overall cost savings if less stormwater management infrastructure is required as a result of their use.

- Improved project marketability—Traditional pavements are typically considered unattractive and increase the temperature of the immediate environment. Reducing the size of paved areas and using more attractive paving such as bricks, gravel, or oyster shells can considerably improve a development's curb appeal.

Submission Requirements

- Site plan(s) showing street patterns, sidewalks, building footprints and their relationship to the street and neighboring parcels, driveways, parking (with dimensions), paving, and exterior lighting.
- Specification sheets with paving materials listed.

Site Design - Parking *0 required points / 3 additional points*

G2 - Parking areas are compact and compatible with the overall project design.

Intent

Increase on-site stormwater management capacity by reducing the coverage of surfaces pervious to water.

Improve the visual appeal of new developments.

Create opportunities for more vegetated open space or other uses.

Parking and paved surfaces are generally considered unattractive by potential residents. Reducing both can increase the appeal of a project. Environmentally, the impacts of less paving include less stormwater runoff to be managed, less contribution to the heat island effect, and less damage to existing vegetation and soil ecology. Economically, reduced paving saves site development costs, as well as stormwater management costs.

The parking space dimensions demanded by local zoning are frequently larger than necessary to accommodate most cars, and with a variance, spaces can be reduced in size. This could save a significant amount of paving within an entire development. The Urban Land Institute and the Institute of Transportation Engineers frequently update their parking standards, and their parking space sizing requirements might provide a better guide of industry best practice than local zoning regulations.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Size parking spaces no larger than local zoning regulations and consider applying for variances that will allow for smaller spaces.
- Use paving alternatives such as permeable concrete, unit pavers, or loose material like gravel or oyster shells.
- Place parking beneath the structure where buildings are elevated to meet flood elevation requirements.
- Consider using shared driveways to provide access to parking spaces on abutting lots.
- For large-scale, high-density projects, consider parking garages.

Submission requirements

- Site plan(s) showing street patterns, sidewalks, building footprints and their relationship to the street and neighboring parcels, driveways, parking (with dimensions), paving, and exterior lighting.

Additional Resources

Loechl, Paul M. et. al. 2003. "Design Schematics for a Sustainable Parking Lot" US Army Corps of Engineers. Publication ERDC/CERL TR-03-12.

<http://www.cecer.army.mil/td/tips/pub/details.cfm?PUBID=4465&TOP=1>

International Parking Institute – A trade association that annually awards recognition for high-quality parking design.

<http://www.parking.org>

Manufacturers of pervious pavements may be found at:

<http://www.kbius.com/>

<http://www.invisiblestructures.com/GP2/grasspave.htm>

<http://www.perviouspavement.org/>

Institute of Transportation Engineers

<http://www.ite.org>

Urban Land Institute

<http://www.uli.org>

Site Design - Stormwater *0 required points / 3 additional points*

H1 - Site stormwater is managed to maintain peak discharge at the site's predevelopment rate.

Intent

Protect adjacent properties from risk of flooding, erosion, and pollution.

Minimize loads on public drainage systems.

Maintaining the peak discharge rate will prevent an increase of stormwater runoff from going onto adjacent properties, which could have a negative impact on health and safety of people, property, and natural ecologies. The cost of new stormwater management infrastructure is a considerable piece of the site development budget. If the development's impact is minimized, the need for such infrastructure may be avoided or significantly reduced. In addition, the use of permeable surfaces and other passive site management strategies can manage stormwater on site, without extensive infrastructure.

These calculations, or hydrologic procedures, are carried out through a set of variables created by the United States Department of Agriculture, Natural Resources Conservation Service (NRCS). The variables are the size of storm event (amount of rainfall in 24 hours), slope of land, and type of surface. This procedure is also used when calculating stormwater sewage pipes as well as appropriate sizes for drainage swales and stormwater detention/retention ponds.

Definitions

Impervious surfaces – Paving or coverage on a development site that does not allow water to pass through to the ground underneath. Common asphalt and concrete are examples of such surfaces.

Urban heat island effect – A condition where the reflection of sunlight off of paved surfaces and buildings increases the local air temperature. Meteorological studies of areas with extreme sprawl, such as metropolitan Atlanta, GA, have shown that the urban heat island effect can alter precipitation patterns.

Submission Requirements

- Site plan(s) showing storm water drainage patterns, storm water infrastructure, and storm water best management practices, with pre and post-development peak storm water calculations.

Additional Resources

EPA Stormwater Management Practices

<http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm>

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Engage the project design team to create drainage plans that ensure post-development peak discharge does not exceed the pre-development peak discharge rate.

Site Design - Stormwater *0 required points / 3 additional points*

H2 - Site stormwater is managed to reduce the pre-development peak discharge rate through the use of EPA Best Management Practices (BMPs), thus reducing discharge rates, erosion, and the build-up of silt and pollutants.

Intent

Minimize loads on public drainage systems.

Protect local water quality by filtering pollutants and silt in storm water on site.

Minimize local flooding hazard by slowing the discharge rate of water during storm events.

Storm Water Best Management Practices (BMP) are site and landscape design solutions that control storm water discharge and pollution in an environmentally sensitive manner, usually through natural processes rather than engineered processes.

BMPs exist in a variety of forms, including bio-swales, rain gardens, detention ponds, or wet ponds. Working with a landscape architect, a developer can create neighborhoods that use stormwater elements as amenities. A bio-swale or rain garden can be planted with native plants such as iris, rushes, butterfly plant, and pond cypress to create something that is beautiful to look at and can serve as a privacy buffer between properties. Detention and wet ponds, which are similar to conventional water features, can become gathering places for neighborhoods. They could even be integrated as part of a neighborhood park. Storm water BMPs allow for more flexibility in site engineering which can help create a more beautiful and functional neighborhood.

One benefit of stormwater BMPs is that they can reduce the need for curbs and gutters, which can result in large cost savings. Ribbon curbs or natural edges that channel water to vegetated areas can be used in place of structured curbs and gutters.

While measures should be taken to control or eliminate pollution at its sources, BMPs should be used as treatment measures associated with stormwater runoff that can occur during the construction process. BMPs should also be incorporated into the design of the development that will deal with post-construction stormwater issues.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Work with a landscape architect and engineer to use BMPs in conjunction with structured storm water management systems.
- Work with a landscape architect to make storm water BMPs part of the landscape amenities plan for the project.

Benefits to Developers

Complying with this standard will offer a developer:

- *Lowered infrastructure costs* – Minimizing structured storm water infrastructure with BMPs can considerably reduce the amount of materials and labor need for construction, therefore, reducing the cost of the project. Storm water BMPs can generate significant cost savings when they are used to minimize below-grade infrastructure, which can be a major part of the site development budget.

Submission Requirements

- Site plan(s) showing storm water drainage patterns, storm water infrastructure, and storm water best management practices, with pre and post-development peak storm water calculations.

Standards Referenced

EPA Stormwater Management Practices

<http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm>

Site Design - Sidewalks *0 required points / 3 additional points*

I1 -Site plan encourages walking along the public streets by providing continuous, accessible, appropriately-lit, frequently-shaded sidewalks, and creates a handicap-accessible route from the sidewalk to the entrance of every public building.

Intent

Reduce the risk of obesity, heart disease, and hypertension by encouraging physical activity associated with alternative modes of transportation and compact development.

Reduce automobile dependency by making alternative modes of transportation convenient and comfortable.

Create venues and routes that allow social interaction between residents to create stronger, more connected neighborhoods.

Sidewalks encourage pedestrian movement and give residents more options for moving around their neighborhood.

The streetscape should be designed to create safe, beautiful and functional public areas for the development. To achieve this, a coordinated streetscape plan should clearly lay out the roadway, street trees, and appropriate lighting, allowing for underground utilities as needed. It is important to choose low-maintenance, native street trees, and to avoid the use of ornamentals, which have shorter life spans because they are more prone to rot and breakage. Deciduous trees, which grow large and provide shade in the summer but let sunlight through in winter, are a good choice. Lighting should be coordinated with city or county lighting requirements and should also be integrated with roadway layout, sidewalk layout, and street trees to create a beautiful and safe development for all users.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Install sidewalks wide enough for at least two people to pass side by side (5'-0" minimum) and that connect with sidewalks on adjacent streets. In neighborhoods without existing sidewalks, extend project sidewalks to the edge of the property so that future sidewalks can connect with the project's walks.
- Work with the city to install sidewalks in the rights of way along the site.
- Install sidewalks that are continuous and without obstacles so that pedestrians do not need to move into the road to cross the site.
- Ensure that sidewalks are accessible for handicapped visitors and residents.
- Place street lighting so that both roadways and sidewalks receive adequate light at night.

- Work with a landscape architect to coordinate plantings with sidewalk placement so that sidewalks will receive shade from trees.

Submission Requirements

- Site plan(s) showing street patterns, sidewalks, building footprints and their relationship to the street and neighboring parcels, driveways, parking (with dimensions), paving, and exterior lighting.
- Site plan(s) or landscaping plan showing the types of plants, their locations, their relationships to buildings and walkways, any trees that will be preserved on the site, and irrigation systems

Building Design Category

Introduction

Through this category, the Development Standards encourage considerate placement and orientation of structures within a development in order to create projects that have a low impact on the environment and places that are enjoyable, healthy, and comfortable for people to live and work in. Here, the Development Standards also encourage distinctive, attractive, connected communities that foster a strong sense of place. They address building design, lot design, the relationship between the development and surrounding neighborhoods, the relationship between buildings and public spaces within developments, and the architectural quality of the project's design.

Category	Criteria	Standard	REQUIRED POINTS	ADDITIONAL POINTS		
Building Design Encourages intelligent placement, orientation, and design of buildings in order to create projects that have low impact on the on the environment, and are enjoyable, healthy, and logical places for people to live and work.	J	Buildings and surroundings	1	The size and scale of the project is compatible with surrounding buildings.	2	3
			2	The size and shape of the structures are compact, and where appropriate, vertical to minimize the building footprints, while at the same time making full use of the site.	2	3
			3	The building configuration responds to climatic conditions, preserves as many healthy existing trees as possible, and where applicable, preserves the neighborhood views towards the water or other important features.	3	2
	K	Public space	1	The buildings do not exceed the setback requirements along the front and side streets.	2	
			2	The building entrances and windows are located to create visibility of the public space from inside the building.	2	3
			3	Paving materials, planting, and lighting are used to enhance the landscape.	2	3
	L	Placemaking	1	The project is designed to create a distinctive asset to the community by creating a positive sense of place, adding value to its surroundings artistically, culturally, ecologically, and economically.	5	7
			2	The building materials and construction details convey consideration to the enduring public value of architecture.	2	4
	Location Totals				20	25

Relevant Guiding Principles:

1. Create a range of housing types and affordable price levels.
2. Foster distinctive, attractive communities with a strong sense of place.
3. Encourage developments that strengthen existing communities.
4. Mix land uses.
5. Create walkable neighborhoods.
6. Encourage public and private collaborations shaped by community and stakeholder participation.
7. Make development decisions predictable, fair, sustainable, and cost effective.
8. Preserve open space, farmland, natural beauty, and critical environmental areas.
9. Consider transportation needs and encourage a variety of transportation options.
10. Take advantage of compact building design.
11. Create developments with low environmental impact.
12. Create energy efficient buildings incorporating Energy Star or greater standards.
13. Create healthy living spaces.

General Resources for Building Design

LEED for Neighborhood Development, 2008
 Draft: Neighborhood Pattern & Design
<http://www.usgbc.org/>

LEED Green Construction & Technology
<http://www.usgbc.org/>

Charter of the New Urbanism
<http://www.cnu.org/charter>

Getting to Smart Growth: 100 Policies for Implementation
<http://www.smartgrowth.org/pdf/gettosg.pdf>

J1 -The size and scale of the project is compatible with surrounding buildings.

Intent

To create high quality developments that influence the surrounding buildings and neighborhoods in a positive way

The neighborhoods surrounding a project site should be a contextual guide for the building types (apartment buildings, town homes, duplexes, etc.) that will be constructed. However, new developments do not need to copy the size and scale of buildings in surrounding neighborhoods. Many neighborhoods along the Gulf Coast have grown with a mix of buildings of different sizes and shapes.

Depending on the site in question, an experienced design team can generate multiple strategies for fitting the number of units that a developer wants to make a project feasible. Some strategies will allow the project to blend in with its surroundings better than others, however. The height and width of buildings, the orientation of buildings to public streets, the shadows cast by new structures, setbacks, and the location of parking can all effect how compatible a project feels in the context of surrounding buildings.

Road and utility infrastructure surrounding the project also influence its compatibility with the neighborhood. The building density allowed by local zoning codes frequently does not match the sewer and road capacity present, and a project that increases local density could require action by the developer to improve local traffic and sewer capacity. Conversely, building a project at densities and scales that are significantly lower than local capacity can handle is a misuse of that infrastructure investment.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions

- Work with an urban planning consultant, the local planning department, architects, or engineers to analyze the prevailing building types, shapes, parking design, and support infrastructure of the area around the project site.
- Use the information collected through this analysis to design the project's buildings, their placement on the site, and their distances from each other.
- Work with the city and a civil engineer to analyze the local capacity of roads and utilities, and size the project to that capacity. If a project at a larger scale is necessary, work with the city to upgrade this infrastructure with public or project funds if needed.

Benefits to Developers

Complying with this standard will offer a developer:

- *Regulatory and community approval* – A project that takes the surrounding community into account is more likely to receive community endorsement at planning commission and city council meetings, thereby speeding up the approval process when special approval is necessary.

Submission Requirements

- Site plan(s) showing street patterns, sidewalks, building footprints and their relationship to the street and neighboring parcels, driveways, paving, and exterior lighting.

Precedents

CNU – Principle 20

Getting to Smart Growth:

Principle 5: Foster Distinctive, Attractive Communities
with a Strong Sense of Place

Principle 10: Enact Clear Design Guidelines so
that Streets, Buildings, and Public Spaces Work
Together to Create a Sense of Place

Additional Resources

LEED-ND: Neighborhood Pattern & Design Section

<http://www.usgbc.org/>

Charter of the New Urbanism

<http://www.cnu.org/charter>

J2 -The size and shape of the structures are compact, and where appropriate, vertical to minimize building footprints

Intent

Increase the provision of housing that is affordable to a variety of income groups.

Create densities that encourage walking and other alternatives to automobile travel.

Reduce the amount of land and materials consumed for urban development.

Provide more room for urban green space.

Compact development refers to both the buildings in a project and the density of those buildings across the project site. In single-family developments, small lots allow for more housing units on a piece of land than larger lots, which can make those homes more affordable to buyers and renters. Alternatively, clustering small lots together in one area of the site allows space to preserve contiguous green space for natural habitat and recreation. In multi-family developments clustering apartment buildings together on a site either allows for more units or for more open space elsewhere on site.

Smaller buildings will reduce the amount of energy and materials needed to construct and maintain them. Buildings with small lot coverage provide opportunities for developers and designers to create neighborhoods with more green space and pervious surfaces. Pervious surfaces contribute to on-site storm water management capacity, which helps prevent flooding and erosion.

When evaluating the compactness of a design, the program and the expected number of users for a space should be considered to determine an appropriate size and shape for a room, a building, and a neighborhood. A development that makes full use of the site will have spaces between buildings that are logical in terms of construction, site stormwater management, and pedestrian quality.

Definitions

Impervious surfaces – Paved areas of a site that do not allow water to pass through to the ground underneath. Common asphalt and concrete are examples of such surfaces.

Lot Coverage – A ratio between the enclosed ground floor area of all structures on a site and the total site area. This differs from floor-to-area ratio (FAR), which is a ratio of the building footprint size to a lot rather than the total building square footage, including multiple stories, to its lot.

Urban heat island effect – A condition where the reflection of sunlight off of paved surfaces and buildings increases the local air temperature. Meteorological studies of areas with extreme sprawl, such as metropolitan Atlanta, GA, have shown that the urban heat island effect can alter precipitation patterns.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Add stories to a multi-family housing project and mixing uses within buildings (e.g., putting commercial space on the ground level with residential above).
- When buildings must be elevated to meet hazard requirements, elevate the building high enough so that parking can be placed underneath the first floor, thereby reducing the amount of impervious surfaces dedicated to parking.
- Work with a landscape architect to consider the development's effect on ecological systems on and near the proposed building site due to increased

building density, amount of impervious surfaces, and the shadows cast.

Benefits to Developers

Complying with this standard will offer a developer:

- *An increased number of saleable/rentable units* – By creating developments that have a higher building density it is often possible to accommodate more units in within the same site, thus maximizing the buildable area of the site.
- *Added value from natural amenities* – Compact house plans free up space on a site for amenities such as parks, other gathering areas, and preserved natural land. These amenities make a project more attractive to potential homebuyers and renters, and the developer often does not need to build them into his or her project if preserving existing environmental resources.
- *Lowered construction costs* – Buildings with smaller footprints have potential construction cost savings due to decreased foundation size, less interior square footage, and a smaller roofing area.

Submission requirements

- Site plan(s) showing street patterns, sidewalks, building footprints and their relationship to the street and neighboring parcels, driveways, paving, and exterior lighting.
- Architectural drawings showing building plans with dimensions and window placement, elevations (exterior views), sections, and construction details.

Precedents

LEED ND –

NPD Perquisite 2: Compact Development

NPD Credit 2: Compact Development

CNU -

Principle 11

Principle 20

Getting to Smart Growth – Principle 2: Take advantage of compact building design

Additional Resources

LEED-ND: Neighborhood Pattern & Design Section

<http://www.usgbc.org/DisplayPage.aspx?CMSPageID=148>

Charter of the New Urbanism

<http://www.cnu.org/charter>

Getting to Smart Growth: 100 Policies for Implementation

<http://www.smartgrowth.org/pdf/gettosg.pdf>

Building Design - Buildings and Surroundings *3 required points / 2 additional points*

J3 - The building configuration responds to climatic conditions, preserves as many healthy existing trees as possible, and, where applicable, preserves the neighborhood views toward the water or other important features.

Intent

To create developments that respond to their surroundings (both at an individual scale and at a neighborhood scale) in a way that is sensitive to the existing amenities of a site

In the hot and humid climate of the Mississippi Gulf Coast a building that responds to climatic conditions will decrease the amount of energy needed (and money spent on utility bills for the user) to cool the space inside. This creates better spaces for living and working, lowers the cost to maintain the spaces, and saves energy. Also, the siting of buildings and infrastructure within a development affects the pre-development landscape. A building that responds to climatic conditions will have windows and openings that face in the correct cardinal directions in order to take advantage of passive heating or cooling.

Preserving healthy, existing trees on site contributes to the quality of the development by providing residents with large shade landscaping immediately upon completion of a project, helping to maintain the existing stormwater management, reducing the loss of habitat for animals, and reducing costs for implementing new landscape designs. Additionally, healthy, existing trees are generally more attractive within a new neighborhood (in contrast to younger new trees, which may take years to mature) and are more likely to be native or local cultivars that will thrive for years into the future. Careful siting of buildings in a new development should contribute to the quality of existing neighborhoods that surround them.

Along the Gulf Coast, the predominant natural features are the beaches along the Mississippi Sound, the bays that surround the coast, and the bayous. Other important visual features could be natural, such as Oak or Pine Savannahs, or man-made features, such as harbors, lighthouses, sculptures, and monuments. When a new development blocks the view or circulation path of the existing neighborhood toward these important features, the value of the surrounding properties is compromised.

Through appropriate positioning of operable screened windows and doors, air circulation within a building will be improved and lower the amount of energy needed to cool a building while contributing to the indoor air quality. Also, building designs will most likely need to vary depending on their location throughout the site, in order to take advantage of passive solar and ventilation, and in order to preserve existing trees.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Perform a thorough site analysis before committing to a site design. Include an evaluation of the topography of the site, the local predominant wind direction, and sun angles. Inventory existing trees, and important views from the site. The site analysis should be a main guide for design decisions regarding the buildings and site plan.
- Place windows on south- and west-facing facades appropriately to limit excessive sun exposure on these warm sides of a building.
- Place covered porches, large overhangs, and screens along south- and west-facing sides of a building to

limit the amount of direct light and heat entering the building.

- Consult local architects, engineers, and HVAC experts regarding options for passive heating and ventilation.
- Design around existing trees, instead of clear cutting and replanting after construction is complete. This will require a thorough plan for staging construction materials and circulation of heavy machinery during the construction phase (see EPA Best Management Practices).
- Approach the site design with sensitivity toward neighborhood views toward important features. Consult the local community (see Category: Program) to get input on which features are important.

Benefits to Developers

Complying with this standard will offer a developer:

- *Improved project marketability* – Preserving healthy existing trees allows mature landscaping to be present when the project goes for sale or rent without the cost of buying, transporting, and planting mature plants. By preserving views towards the water or other important feature, a developer will be able to capitalize on these built-in amenities and build a better relationship with the surrounding community.

Submission Requirements

- Site plan(s) showing street patterns, sidewalks, building footprints and their relationship to the street and neighboring parcels, driveways, paving, and exterior lighting.
- Site plan(s) or landscaping plan showing the types of plants, their locations, their relationships to buildings and walkways, any trees that will be preserved on the site, and irrigation systems.

Standard Referenced

EPA Best Management Practices

<http://cfpub.epa.gov/npdes/stormwater/menuofBMPs/index.cfm>

Precedents

LEED ND – GCT Credit 11: Solar Orientation

Getting to Smart Growth – Principle 5: Foster Distinctive, Attractive, Communities with a Strong Sense of Place

CNU – Principle 26

Building Design - Public Space *2 required points / 0 additional points*

K1 - The buildings do not exceed the setback requirements along the front and side streets.

Intent

Encourage social interactions and pedestrian movement at the street level

Reduce the extent of impervious surfaces, thereby increasing on-site stormwater management capacity

The distance between a building and the sidewalk greatly influences the experience of the pedestrian. When a building is close to the sidewalk it provides shade. The amount of shade decreases and pedestrians' feelings of exposure increase when setbacks increase. In a mixed-use or commercial area, businesses benefit from the visibility that proximity to the street provides. In residential areas, smaller setbacks (especially if the building has a front porch) encourage social interactions.

Additionally, a building with smaller setbacks will require less paving and impermeable surfaces necessary for driveways and paths from the street than buildings with larger setbacks. This increases the capacity of on-site stormwater management.

Definitions

Impervious surfaces – Paved areas of a site that do not allow water to pass through to the ground underneath. Common asphalt and concrete are examples of such surfaces.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Place the buildings' front facades as close to the required minimum front setbacks (or side setbacks if on a corner) as required by the municipality's zoning regulations without endangering healthy, existing trees or other natural features.
- Request a variance with the municipality when the project would be improved with setbacks that are smaller than the minimum required by zoning regulations.

Submission Requirements

- Site plan(s) showing street patterns, sidewalks, building footprints and their relationship to the street and neighboring parcels, driveways, paving, and exterior lighting.
- Current zoning and required setback information for the site.

Precedents

CNU – Principle 23

Principle 11

Principle 22

LEED ND – NPD Credit 1: Walkable Streets

Building Design - Public Space *2 required points / 3 additional points*

K2 - The building entrances and windows are located to create visibility of the public space from inside the building.

Intent

Enhance the safety of public or common space around buildings in new developments.

Promote social interaction by providing space where people can meet face to face at the edge of private and common property.

Facades with windows and entrances provide more visual interest than blank walls for people passing by on the street or sidewalk, and by placing windows, doors, porches, decks, and balconies so that they face public streets or common space, a building's designer provides the sense that the building is facing that street or public space. Blank walls can give the sense that the building's designer or developer wants occupants to ignore these areas.

Clearly visible entrances allow visitors and residents to enter and exit buildings safely and without fear of attack from hidden persons. Windows, porches, and decks that provide view of public or private common space from inside buildings allow residents to monitor their surroundings and contribute to community safety. These building elements can also provide opportunity for social interaction by encouraging occupants to sit or look outside and interact with passersby.

Keep in mind that there are structural considerations regarding hurricane-resistant construction methods that may determine a limit to the number of windows that a developer can put in a facade (see Standard N.1). Also, certain parts of the home, such as restrooms and bedrooms, require privacy; windows in these areas should be placed with care.

Elevated homes present special design challenges for creating safe, attractive entrances and views of the outside. The developer and project design team should ensure that there are clear lines of sight to entrances for elevated homes and that windows still provide views of the street below.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Work with the design team to create simultaneously floor plans and site plans that maximize views.
- Leave enough transparency so that the paths to entrances remain clear when installing screening on the underside of an elevated structure.

Benefits to Developers

Complying with this standard will offer a developer:

- *Improved project marketability* – Well-designed building facades that address the street front with well-placed windows and entrances are visually appealing and can command higher prices or rents. Proper window placement simply requires that buildings are carefully arranged and designed, and generally do not add cost to the construction of a building.

Submission Requirements

- Site plan(s) showing street patterns, sidewalks, building footprints and their relationship to the street and neighboring parcels, driveways, paving, and exterior lighting.
- Architectural drawings showing building plans with dimensions and window placement, elevations (exterior views), sections, and construction details.

Precedents

Getting to Smart Growth – Principle 5: Foster Distinctive, Attractive Communities with a Strong Sense of Place
Principle 2: Take Advantage of Compact Building Design

CNU – Principle 23
Principle 26

LEED ND – NPD Credit 1: Walkable Streets

Building Design - Public Space *2 required points / 3 additional points*

K3 - Paving materials, planting, and lighting are used to enhance the landscape.

Intent

Encourage use of outdoor spaces for passive and active recreation.

Contribute to the safety, health, and comfort of residents and visitors.

Well designed landscapes encourage people to go outdoors, engage in physical activity, and they provide inviting venues for interaction between neighbors. Besides giving a project enhanced visual appeal, as discussed in Standard H.1 and H.2, these landscaping elements can also improve on-site stormwater management.

Outdoor lighting is an important element for creating a safe and pleasant pedestrian environment. However, it is possible to install outdoor lighting that is too bright or wasteful because it emits light upward and away from the street, producing uncomfortable levels of illumination and contributing to light pollution. Light quality is also an important consideration, as different commercially-available lamps can emit different spectrums. For example, compressed sodium lamps, while inexpensive and energy efficient, generate a yellow hue which many people find unattractive. Finding lamps that balance pleasing light quality with energy efficiency and acceptable maintenance costs is an important part of the landscaping process.

In general, this standard discourages using fences or plantings to create barriers between a development and its surroundings.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Consult a landscape architect to design common areas and individual lots.
- Create clear access to common areas so that residents can use them for recreation where appropriate.
- Use plantings to shade public spaces and pathways, and as part of the site's stormwater management plan.
- Choose plantings that are native or non-invasive local cultivars (see Criteria F: Open Spaces).
- Install lamps that provide enough ambient light for safe travel along sidewalks, paths, and roads, but which do not over light the area.
- Install exterior lighting fixtures that use solar power or LEDs to reduce energy consumption.

Benefits for Developer

Complying with this standard will offer a developer:

- *Improved project marketability* – Landscaping plans that integrate with the building can create projects that are more visually appealing and potentially more attractive to potential homebuyers and renters, which can translate into higher sale prices for the development.

Submission Requirements

- Site plan(s) showing street patterns, sidewalks, building footprints and their relationship to the street and neighboring parcels, driveways, paving, and exterior lighting.
- Site plan(s) or landscaping plan showing the types of plants, their locations, their relationships to buildings and walkways, any trees that will be preserved on the site, and irrigation systems.

Precedents

Getting to Smart Growth – Principle 5: Foster Distinctive,
Attractive Communities with a Strong Sense of Place
Principle 2: Take Advantage of
Compact Building Design

CNU – Principle 23

LEED ND – NPD Credit 7: Transit Facilities

Additional Resources

Mississippi State University Extension Services

<http://msucares.com>

Building Design - Placemaking *5 required points / 7 additional points*

L1 - The project is designed to create a distinctive asset to the community by creating a positive sense of place, adding value to its surroundings artistically, culturally, ecologically, and economically.

Intent

To encourage the overall quality of design throughout the entire project.

This standard is a culmination of all the Development Standards. It encourages a cohesive synthesis between the mandatory provisions listed in the Development Standards and the resultant project as a whole. Rather than looking at specific factors independently, Standard L1 seeks to analyze the aggregate total in terms of overall quality.

The terms 'distinctive asset' and 'positive sense of place' are qualitative terms that refer to the character of the development, how it reflects the cultural traits of the community, and how it harmonizes with existing neighborhoods, and displays consideration for the natural ecology of the area.

Visual quality is certainly another factor in the analysis of a project's successfulness, although it is not the only measure of evaluation. The Renaissance Builder & Developer Guild has no intention of dictating specific architectural styles or promoting historical replications. Rather, it wishes to endorse and support developments that are well-designed, regardless of the architectural style. Many factors affect the quality of a design (such as size, shape, scale, circulation paths, space efficiency, energy efficiency, historical and cultural references, formal and spatial attractiveness, etc...) and as many of these factors should be addressed as possible.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Work with professionals of expertise, such as architects, landscape architects, engineers, real estate specialists, along with the surrounding community to plan and build the projects.
- Become well-informed about the character of the project's surroundings and local ecological features.

Benefits to Developers

Complying with this standard will offer a developer:

- *Retention of value over time* – Developments that display consideration to design and how the development harmonizes with its surroundings create high-quality, long-lasting developments which increase their marketability and retention of value over time.

Submission Requirements

- Program statement that clearly defines the proposed housing types, the number of units, the ownership structure, the cost (to the user and the developer), the building uses, accessibility to those buildings, and

any services that are within walking distance of the proposed development or included in the design of the development.

- Site plan(s) showing street patterns, sidewalks, building footprints and their relationship to the street and neighboring parcels, driveways, parking (with dimensions), paving, and exterior lighting.
- Site plan(s) or landscaping plan showing the types of plants, their locations, their relationships to buildings and walkways, any trees that will be preserved on the site, and irrigation systems.
- Architectural drawings showing building plans with dimensions and window placement, elevations (exterior views), sections, and construction details.
- Any architectural/marketing renderings of the buildings and the project site.

Precedents

Getting to Smart Growth – Principle 5: Foster Distinctive, Attractive Communities with a Strong Sense of Place

CNU – Principle 24
-Principle 20

Building Design - Placemaking *2 required points / 4 additional points*

L2 - The building materials and construction details convey consideration to the enduring public value of architecture.

Intent

Create developments with high-quality construction that stands up to the harsh climate of the Gulf Coast and retains its visual appeal over time

Material choices and construction details are an essential determinant of a development's long-term attractiveness and value for both residents and the surrounding community. Material selection includes, but is not limited to, the site materials, foundation system, floor system, wall system, roof system, exterior cladding, interior sheathing, exterior sheathing, light fixtures, plumbing fixtures, flooring, insulation, strapping, paint, and any other interior or exterior finishes.

Devoting consideration and money to the structural and finishing elements of a building can make even the simplest architecture attractive and distinctive; conversely, low-quality or haphazardly chosen materials can make well-designed buildings seem cheap. Attention to detail, which is frequently missing in today's building industry, is often what makes historic structures appealing, even those structures that were originally built on modest overall budgets.

Furthermore, the climate of the Gulf Coast, with its severe heat, moisture, and storm events, requires materials that are suitable for local conditions. These kinds of materials will not only maintain their appearance, but will also help protect the interior structure of the building and important systems like the electrical wiring. Well-built structures will also protect indoor environments from invasion by mold and other contaminants.

Many materials that are used in conventional construction degrade indoor air quality (ex: vinyl flooring that off-gases high levels of VOCs), are not suitable for high wind zones (ex: vinyl exterior siding), or are simply expensive and don't contribute visually nor structurally to the building design (ex: extraneous brick veneer).

The initial cost of building materials and construction techniques adapted to the Coast's climate might be high, but the cost is made up over the life of the building if occupants spend less on maintenance and if these quality materials help maintain resale or rental values.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Consult or hire architects, engineers that will be able to expertly advise material selection.
- Detail construction documents to reflect proper installation of materials in accordance with local building codes and FEMA requirements for hazard protection.
- Consider all parts of a building when evaluating the quality of the building materials and construction details.

Benefits for Developer

Complying with this standard will offer a developer:

- *Improved project marketability* – Landscaping plans that integrate with the building can create projects that are more visually appealing and potentially more attractive to potential homebuyers and renters, which can translate into higher sale prices for the development.
- *Retention of value over time* – Developments that display consideration to design and how the development harmonizes with its surroundings create high-quality, long-lasting developments which increase their marketability and retention of value over time.

Submission Requirements

- Architectural drawings showing building plans with dimensions and window placement, elevations (exterior views), sections, and construction details.
- Specification sheets with interior and exterior materials and finishes noted, or wall sections showing construction methods.

Precedents

Getting to Smart Growth – Principle 5: Foster Distinctive, Attractive Communities with a Strong Sense of Place

CNU – Principle 24

Principle 20

Building Systems Category

Introduction

The intent of the Building Systems standards is to promote building practices that protect both the inhabitants and the environment. Many of the standards regulate materials, systems, and strategies that affect the quality of the indoor environment in order to create comfortable, healthy spaces for the occupants. Other standards attempt to reduce detrimental environmental impacts resulting from material harvesting, energy generation, as well as toxic material manufacturing and disposal.

The Building Systems standards also encourage and reward energy and water efficiency in homes. Aside from the environmental benefits, building to these standards can reduce utility bills for occupants and provide developers with features that capitalize on the public's increased interest in green building. These features can offer developers market differentiation and the potential for recognition within the industry for their efforts to create developments with low environmental impacts.

The standards for healthy living spaces deal with interior materials and design considerations related to the size and shape of interior rooms, as well as the placement of windows that allow natural light into the home and provide views of the outdoors.

Category		Criteria	Standard	Required Points	Additional Points	
Building Systems Promotes buildings that are beneficial to their inhabitants and the environment by creating spaces that are healthy, comfortable, and efficient.	M	Buildings and surroundings	1	Paints, primers, and sealants comply with Green Seal Standards and carpet, carpet pad, and adhesives comply with Green Label Certification.	4	
			2	Materials used promote healthful indoor environments have little negative environmental impact		3
			3	Materials made with recycled content, local materials, salvaged materials, rapidly renewable materials, FSC Certified Wood Products, or engineered wood products are used for a minimum of 10% of the total project material cost.		3
	N	Hazard protection	1	The project complies with municipal and FEMA requirements for hazard protection and uses materials and construction details that are durable and suitable for hurricane resistant construction, with additional points awarded for materials and construction details that go beyond these requirements.	3	2
	O	Indoor environment	1	The interior spaces are well-proportioned, naturally lit and provide a clear sense of weather, location and time.	3	2
			2	Mechanical systems for heating, cooling, and air conditioning (HVAC) are sized using the Air Conditioning Contractors of America (ACCA) Manual J.	4	
	P	Energy use	1	The building(s) meet Energy Star requirements. Additional points will be awarded for earning Energy Star Certification and/or further reducing energy needs and employing innovative energy technology.	4	7
	Q	Water usage	1	All lavatory faucets, toilets, and shower heads must have the EPA's WaterSense label or meet the flow rate restrictions of the WaterSense program.	2	
			2	Collected roof water, greywater, or site runoff water is used for irrigation purposes, if irrigation is necessary.		3
	Location Totals				20	20

Relevant Guiding Principles:

1. Create a range of housing types and affordable price levels.
2. Foster distinctive, attractive communities with a strong sense of place.
3. Encourage developments that strengthen existing communities.
4. Mix land uses.
5. Create walkable neighborhoods.
6. Encourage public and private collaborations shaped by community and stakeholder participation.
- 7. Make development decisions predictable, fair, sustainable, and cost effective.**
8. Preserve open space, farmland, natural beauty, and critical environmental areas.
9. Consider transportation needs and encourage a variety of transportation options.
- 10. Take advantage of compact building design.**
- 11. Create developments with low environmental impact.**
- 12. Create energy efficient buildings incorporating Energy Star or greater standards.**
- 13. Create healthy living spaces.**

General Resources for Building Systems

US Green Building Council – Green Home Guide
www.greenhomeguide.org

National Association of Home Builders – Green Building Program
<http://www.nahbgreen.org/>

Environmental Protection Agency – Green Building
<http://www.epa.gov/greenbuilding/>

Building Green
<http://www.buildinggreen.com/>

M1 - Paints, primers, and sealants comply with Green Seal Standards and carpet, carpet pad, and adhesives comply with Green Label Certification

Intent

Reduce indoor air contaminants that are hazardous to the health and comfort of building occupants.

Americans spend on average 90% of their time indoors in environments that the EPA has reported may have pollutant levels between 200% and 500% of outdoor levels. Using low-VOC materials reduces the level of hazardous airborne chemicals in indoor and outdoor environments. Common building materials that emit VOCs are paints and primers, caulks and sealants, vinyl flooring, composite wood products (found in cabinets, flooring, and sheathing), and carpet adhesives.

Carpeting may lower indoor environmental quality in several ways. Over time, carpets can harbor allergens, mold spores, mites, and various microbes that pose health risks. Also, carpet pads and adhesives may release harmful VOCs into the indoor environment. Finally, when carpets are installed below grade (i.e., in basements or sunken rooms) or near moisture-prone areas (e.g., kitchens, laundry rooms, and baths) they can hold moisture and enable the rapid growth of mold.

Definitions

Volatile Organic Compounds (VOCs) – Organic chemical compounds that are able to vaporize at normal room temperatures. Many common construction materials and finishes contain such compounds even though breathing them in vaporized form can contribute to lung tissue damage, reduced lung function, and increased irritant sensitivity.

Green Label Certification – A program administered by the Carpet and Rug Institute (CRI) to provide information relating to carpet and its effects on indoor air quality. Two levels of certification are currently available; Green Label and Green Label Plus.

Green Seal – An independent, non-profit organization dedicated to safeguarding the environment and transforming the marketplace by promoting the manufacture, purchase, and use of environmentally responsible products and services. This organization administers a certification program for various products, including paints, primers, and sealants that release low levels of VOCs.

Flush Out – A process used to expel unwanted odors and chemicals from a structure once builders have finished construction but before occupancy. The flush out period can last from several days to several weeks.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Specify that all paints and primers have Green Seal Certification or equivalent.
- Use products that meet the Carpet and Rug Institute's Green Label certification program (or equivalent) if installing carpet, carpet pads, and adhesives.
- Do not install carpet in below-grade areas, entryways, or in rooms with plumbing fixtures.

Benefits to Developers

Complying with this standard may offer a developer:

- **Lowered compliance costs** – The use of low-off-gassing finishes reduces or eliminates the unpleasant chemical odors associated with new construction. New construction projects are often encouraged (and required in some areas) to undergo a post-construction, pre-occupancy period of 'flush out' to expel unwanted odors and chemicals before occupancy, which can last several weeks. The usage of low/no VOC materials can shorten or eliminate this period.

Submission Requirements

- Specification sheets with interior and exterior materials and finishes noted. In order to assist with evaluation under this standard, please specify the manufacturer and product number for all carpets, carpet pads, and adhesives, as well as the manufacturer and product name for all paints, primers, and sealants.

Standards Referenced

GS-11 – Green Seal Environmental Standard for Paints and Coatings

The Carpet and Rug Institute's Green Label Program

Precedents

Enterprise Green Communities –

7-2: Low/No VOC Adhesives and Sealants

7-4: Green Label Certified Floor Coverings

7-16: Healthy Flooring Materials: Alternative Sources

LEED NC –

EQ Credit 4.1: Low-Emitting Materials: Adhesives & Sealants

EQ Credit 4.3: Low-Emitting Materials: Carpet Systems

LEED H – MR Credit 2.2: Environmentally Preferable Products

Additional Resources

Green Seal Website – Listings of Green Seal approved paints and primers can be found here.

<http://www.greenseal.org/>

The Carpet and Rug Institute's Green Label Program Website- Green Label certified carpets, adhesives, and pads can be found here.

<http://www.carpet-rug.org/residential-customers/selecting-the-right-carpet-or-rug/green-label.cfm>

M2 - Materials used promote healthful indoor environments and have little negative environmental impact

Intent

Minimize indoor air contaminants that are hazardous to the health and comfort of building occupants.

Support industries producing materials that are less harmful to humans and the environment during manufacturing, usage, and disposal.

Tremendous amounts of energy are used in the process of extracting resources and turning them into usable construction materials. The lifecycle of materials — including harvesting, manufacturing, transportation, installation, use, and disposal — all have economic, environmental, and human health impacts that should be understood and considered during the material selection process. Although every material will have an environmental impact, developers should choose materials that minimize negative effects on human and environmental health.

Lifecycle analysis considerations are an important factor in selecting a material palette for a development. Although listing every material's lifecycle cost analysis in this document isn't feasible, consider the lifecycle impacts of the following material as example:

Polyvinyl Chloride (PVC) – A thermoplastic polymer that is rapidly finding more applications in the building industry, despite concerns regarding its toxicity and impact on human and environmental health. PVC has been shown to pose health and environmental risks across its lifecycle, from manufacturing to disposal.

Manufacturing - The manufacturing of PVC has been shown to contaminate groundwater supplies and increase air pollution. Residents living near PVC plants have, on average, blood dioxin levels 3 times higher than most Americans.

Usage - Depending on its intended use, PVC often has chemical plasticizers and stabilizers added to it in order to alter its physical characteristics- i.e. making it more thin and flexible or rigid and durable. Often, these additives are more harmful to humans than the PVC itself, leaching out mercury, dioxins, phthalates, and VOCs over its lifespan.

Disposal - PVC can be recycled but it is uncommon because due to its high cost. Toxic additives that soften or stabilize PVC complicate the recycling process. As a result, only 0.1% – 3% of PVC is recycled. PVC is not biodegradable, and simply granulates into smaller pieces, diffusing chemicals into the air and soil. During building fires, PVC releases toxic hydrogen chloride gas, forming hydrochloric acid that is deadly when inhaled by firefighters and building occupants.

Definitions

Environmental impact is an assessment of the possible natural, social and economic impact-- positive or negative-- that a proposed material may have on the environment.

Dioxins – Properly known as polychlorinated dibenzodioxins, these substances are harmful compounds that result from various manufacturing and energy production processes. Dioxins are harmful to humans and animals and have been classified as a Group 1 (most serious) carcinogen by the International Agency for Research on Cancer. They are also known to cause potentially lethal effects to the human immune system and harm the reproductive system.

Formaldehyde – A compound found in resin binders common to engineered sheet materials such as MDF, OSB, and particle board. Urea-formaldehyde is the worst of several types of binders that have been shown to be significant sources of VOC emissions. There are several strategies to control this dangerous off-gassing, and several types of engineered wood now contain types of formaldehyde binders that do not off gas.

Healthful indoor environments – Those that have minimal amounts of harmful volatile organic compounds (VOCs) present, provide comfort and safety to building occupants, and create spaces that are habitable and comfortable.

Life cycle assessment – An analysis that evaluates the environmental impacts of a given product over its entire life, also known as a 'cradle-to-grave analysis'.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Install non-vinyl flooring in buildings. Numerous products are available for flooring, many with higher durability.
- Consider the use of wood, stone, cementitious fiberboard, or other materials to clad the building.
- Avoid vinyl siding, which has been shown to off gas in high heat to be less durable in strong winds, and to be less effective at resisting strong winds and degradation from sunlight.
- Use urea-formaldehyde free composite wood and agrifiber products or use products that meet ANSI Standards 208.1 and 208.2 for low-VOC limits (0.30 ppm for industrial particle board and MDF and 0.20 ppm for particle board flooring)
- If products have VOC ratings above the ANSI Standards, seal all edges and sides with a water-based low-VOC sealant.

Benefits to Developers

Complying with this standard may offer a developer:

- *Improved project marketability* – The use of high-quality cladding and flooring materials creates more attractive and marketable neighborhoods that convey a sense of durability and permanence.

Submission requirements

- Specification sheets with interior and exterior materials and finishes noted. In order to assist with evaluation under this standard, please specify the manufacturer and product number for all wood and agrifiber products
- (particle board, MDF, OSB, plywood, wheatboard, strawboard, panel substrates, door cores).
- If wood and agrifiber products do not comply with ANSI Standards 208.1 and 208.2 specify the low-VOC waterborne sealers used to seal all edges and sides.
- Narrative describing any measures taken to increase indoor environmental quality.

Precedents

Enterprise Green Communities –

- 7-1: Low/No VOC Paints and Primers
- 7-2: Low/No VOC Adhesives and Sealants
- 7-3: Urea Formaldehyde-free Composite Wood
- 7-4: Green Label Certified Floor Coverings
- 7-16: Healthy Flooring Materials: Alternative Sources

LEED NC –

- EQ Credit 4.1: Low-Emitting Materials: Adhesives & Sealants
- EQ Credit 4.2: Low-Emitting Materials: Paints & Coatings
- EQ Credit 4.3: Low-Emitting Materials: Carpet Systems
- EQ Credit 4.4: Low-Emitting Materials: Composite Wood and Agrifiber Products

LEED H – MR Credit 2.2: Environmentally Preferable Products

Additional Resources

Healthy Building Network – Report on PVC.

<http://www.healthybuilding.net/pvc/ThorntonPVCsummary.html>

U.S. Green Building Council – Information on healthy building materials.

<http://www.usgbc.org/resources>

American National Standards Institute

<http://www.ansi.org/>

The Story of Stuff – Video on Lifecycle Cost

<http://www.storyofstuff.com/>

Building Systems - Buildings and Surroundings *0 required points / 3 additional points*

M3 - Materials made with recycled content, local materials, salvaged materials, rapidly renewable materials, FSC Certified Wood Products, or engineered wood products are used for a minimum of 10% of the total project material cost.

Intent

Reduce the impact of extracting, processing, and transporting virgin building materials.

Extend the lifecycle of existing building materials.

Reduce waste.

Tremendous amounts of energy are used in the process of extracting resources and turning them into usable construction materials. Each part of the material lifecycle process—harvesting, manufacturing, transportation, installation, use, and disposal all have economic, environmental, and human health impacts that should be understood and considered during material selection. Using local materials, salvaged materials, rapidly renewable materials, materials with recycled content, FSC Certified Wood Products and engineered wood products lessen the impact of construction on the environment.

Note, however, that salvaged old windows and doors should not be installed at the expense of energy efficiency. Be aware that some salvaged materials end up being more costly to the project than virgin materials due to the high cost of labor involved in the recovering and refurbishing process.

Buying local products increases demand for building materials and products that are created within the region which supports local businesses, and reduces the environmental impacts of transportation.

Definitions

Recycled and Salvaged Materials – Materials that have been recovered or diverted from the waste stream. Post-consumer recycled content enters the manufacturing process again to create new materials after their first use.

Local Materials – Building products extracted, harvested, recovered, and manufactured within 500 miles of the building site.

Rapidly Renewable Materials – Construction products made from plants that are typically harvested within a ten-year cycle. Common examples include bamboo, cotton batt insulation, linoleum flooring, cork flooring, wool carpet, sunflower seed board panels, and wheatboard panels.

Engineered Wood Products – Building materials Composed of small wood members built up to form a larger whole, thereby reducing the amount of larger, old-growth timber required. Many engineered products are readily available, and common examples are OSB and engineered joists.

Forest Stewardship Council (FSC) Certified Wood Products – Products certified under the Forest Stewardship Council's Principles and Criteria. Examples of these materials are structural framing members, flooring, sub-flooring, and wood doors.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Begin choosing materials early in the design process and investigate local sources for these materials. When available, choose materials that have been shown to be less environmentally harmful than common building materials.
- Consider using construction products that are often available with post-consumer or post-industrial recycled content such as metal, concrete, masonry, acoustic tile, drywall, carpet, ceramic tile, and insulation.
- Consider visiting salvage yards and local demolition companies, which are often good sources for common materials such as masonry units or wood flooring.
- Consider using engineered wood products in construction.

Submission Requirements

Specification sheets with interior and exterior materials and finishes noted.

- Construction material budget with recycled content, local materials, salvaged materials, rapidly renewable materials, FSC Certified Wood Products, or engineered wood products highlighted.

Benefits to Developers

Complying with this standard may offer a developer:

- *Improved project marketability* – The trend of using environmentally conscious products in homes has made these materials, particularly rapidly renewable materials such as bamboo, more readily available and affordable. Additionally, consumers find environmentally conscious materials in the home increasingly attractive and can be a valuable selling point for developers.
- *Lowered construction costs* – Modern engineered products have dimensional stability and decreased weight. They can reduce construction time and increase efficiency, and reduce construction labor costs. This is particularly true if ordering structural members that are cut to size prior to arriving on site, a common practice with I-joists and manufactured trusses.

Precedents

Enterprise Green Communities –

6-2: Recycled Content Material

6-3: Certified, Salvaged, and Engineered Wood

LEED NC –

MR 3.1: Materials Reuse: 5%

MR 3.2: Materials Reuse: 10%

MR 4.1: Recycled Content: 10%

MR 4.2: Recycled Content: 20%

MR 5.1: Regional Materials: 10% Extracted, Processed, & Manufactured Regionally

MR 6: Rapidly Renewable Materials

MR 7: Certified Wood

LEED for Homes – MR 2.2: Environmentally Preferable Products

Additional Resources

Forest Stewardship Council – Listing of certified products and distributors.

www.fscus.org/green_building

Oikos – Searchable directory of resource-efficient building products.

www.oikos.com

CRBT – Guide to resource-efficient building elements.

www.crbt.org/index.html

Building Systems - Hazard Protection *3 required points / 2 additional points*

N1 - The project complies with municipal and FEMA requirements for hazard protection and uses materials and construction details that are durable and suitable for hurricane resistant construction, with additional points awarded for materials and construction details that go above and beyond these requirements.

Intent

To create safe, durable buildings that will withstand the climate of the Gulf Coast.

Buildings on the Gulf Coast must withstand the hazards of frequent hurricanes, tropical storms, and high wind events. In addition, the region's hot, humid climate and sandy soil present challenges to a building's longevity. At minimum, development projects must incorporate the building technologies and techniques required by law and, whenever possible, go beyond those laws to create safe, long-lasting structures and neighborhoods. The quality and durability of development projects impact the long-term viability of communities in the region. If residents and outside investors perceive the structures in a neighborhood as well-constructed and resistant to hazardous weather conditions, then it increases the likelihood and speed of rebuilding after a major storm event.

Further, durability is perhaps the most critical aspect of sustainability; poorly constructed buildings are more likely than well constructed buildings to receive damage during a hurricane and will deteriorate faster under everyday conditions. Building materials that once comprised buildings find themselves in landfills, forests, and bodies of water upon destruction of the structure. Additionally, new materials need to be produced and virgin materials must be harvested to create structures to replace those which were demolished. The production of new materials often involves highly environmentally detrimental manufacturing processes using toxic chemicals and high amounts of energy.

This standard evaluates the structural integrity of proposed buildings and the durability of the project's materials.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Confirm that your architect or engineer is familiar with the requirements for building on the Gulf Coast. The architect/engineer should be fully versed in wind load requirements and structural design using ASCE Standard 7-98: Minimum Design Loads for Buildings and Other Structures, SSTD 10-99: Standard for Hurricane Resistant Residential Construction, and FEMA guidelines regarding construction in coastal areas.
- Meet or exceed the guidelines relating to hurricane-

resistant construction in the documents listed above as well as local regulations governing the placement and construction of buildings.

- Construct buildings at an elevation that meets or exceeds the requirements set forth by FEMA's Digital Flood Insurance Rate Maps (D-FIRMS) or local law, whichever is more stringent.

Submission Requirements

- Architectural drawings showing building plans with dimensions and window placement, elevations (exterior views), sections, and construction details.
- Specification sheets with interior and exterior materials and finishes noted.

Benefits to Developers

Complying with this standard may offer a developer:

- *Improved Project Marketability* – Homes designed to withstand hurricane forces can earn reduced wind insurance premiums through the Mississippi Windstorm Underwriting Association. These reductions can improve the long-term affordability of a project to buyers and can differentiate a project from other available housing.

Standards Referenced

Southern Building Code Congress International (SBCCI)

– SSTD 10-99: Standard for Hurricane Resistant Residential Construction

American Society of Civil Engineers (ASCE) – Standard

7-98: Minimum Design Loads for Buildings and Other Structures

FEMA Coastal Construction Manual: Principles and Practices of Planning, Siting, Designing, Construction, and Maintaining Buildings in Coastal Areas

Building Systems - Indoor Environment *3 required points / 2 additional points*

O1 - The interior spaces are well-proportioned, naturally lit and provide a clear sense of weather, location and time.

Intent

Promote healthful indoor environments that are livable and comfortable for the building occupants.

Provide visual connections to the outdoors

Creating spaces that are well proportioned in terms of floor area and ceiling height makes areas that feel welcoming and comfortable to occupants. For example, increasing a room's ceiling height can make even modestly sized rooms feel more spacious. Giving consideration to the proportions of space and providing natural light provide long-term satisfaction for the occupants.

Higher ceilings also increase cooling efficiency by allowing warm air to rise above the living space in. Ceiling fans are more effective at cooling rooms with higher ceilings and higher ceilings allow larger clearances between living areas and rotating blades. The difference in cost between an 8 foot ceiling and a 9 foot ceiling is marginal, and the benefits in terms of comfort level and passive cooling are considerable.

Spaces that are at least partially day-lit have been shown to reduce the incidence of illness and increase the productivity of commercial building occupants. Johns Hopkins researchers conducted a study that linked the wellbeing of patients suffering from depression to the quality of light in the rooms in which they were treated. The report concluded that patients in "sunny" hospital rooms were treated for an average of 16.9 days, compared to 19.5 days for patients in "dull" rooms.

Appropriately placed windows also provide occupants with views of their outdoor surroundings, allowing them to monitor and enjoy activity on the street and landscaped or natural areas. Finally, daylighting has the potential to substantially reduce lighting bills especially when used in conjunction with dimmable switches and fixtures.

Definitions

Daylighting- Designing a building's windows and other openings so that occupants can use natural light for illumination rather than artificial lighting.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Ensure that all rooms have an adequate amount of floor area for the intended function.
- Consider using ceiling heights of 9 feet or greater.
- Place windows in locations that allow views out to the public areas of the neighborhood and any natural features that occupants might enjoy. Pay particular attention to the public areas of a home (i.e. living/dining/cooking spaces) and the views that the windows in those areas provide.
- Design and place windows such that light can penetrate as far as possible into rooms. In rooms that are particularly deep, consider using light shelves (horizontal fixtures below windows that reflect light back into a room).
- Place clerestory windows on the north side of a space to allow light in but reduce the amount of solar heat gain.
- Pair daylighting strategies with dimmable switches, fixtures, and lights that allow occupants to balance artificial and natural lighting.
- Consider appropriate shading devices that control solar heat gain and provide controllable levels of daylighting. These can be both interior elements (shades, louvers, blinds) and exterior elements (overhangs, trees, shade walls).

Benefits to Developers

Complying with this standard may offer a developer:

- *Improved project marketability* – The quality of indoor spaces is perhaps the most critical selling point for prospective homeowners and renters and a determining factor in keeping residents there for the long-term. Developments with buildings that are poorly designed are more likely to have high tenant turnover rates and lower homeowner satisfaction.

Submission Requirements

Architectural drawings showing building plans with dimensions and window placement, elevations (exterior views), sections, and construction details.

Precedents

LEED NC –

EQ 6.1: Controllability of Systems: Lighting

EQ 8.1: Daylight & Views: Daylight 75% of Spaces

EQ 8.2: Daylight & Views: Daylight 90% of Spaces

Additional Resources

Innovative Design – Analysis of performance of students in daylight schools.

www.innovativedesign.net/studentperformance.htm

The Whole Building Design Guide; Daylighting

<http://www.wbdg.org/resources/daylighting.php>

Lawrence Berkeley National Laboratory – Building Technologies Program- Tips for Daylighting with Windows.

<http://btech.lbl.gov/pub/designguide/dlg.pdf>

Building Systems - Indoor Environment *3 required points / 2 additional points*

O2 - Mechanical systems for heating, cooling, and air conditioning (HVAC) are sized using the Air Conditioning Contractors of America (ACCA) Manual J.

Intent

Reduce energy demand by properly sizing mechanical components within a home

Provide fresh air to building occupants, allow indoor air pollutants to exhaust to the exterior environment, and control moisture content in the air.

As building technology progresses, houses are becoming more airtight and better insulated. However, many HVAC systems are designed and installed without accounting for these changes and they provide much greater cooling and heating loads than the building actually requires. This oversizing makes the system more costly to purchase and install, creates inefficiencies in the heating and cooling cycles, and can cause large temperature swings in the house. Importantly, oversized HVAC systems often do not run long enough to dehumidify the air in a house, which can lead to moisture and mold problems.

The drive to increase energy efficiency in homes has led to tighter building envelopes that reduce heat gain and loss, but which also prohibit buildings from 'breathing,' and allowing airborne contaminants embedded in construction materials to diffuse out of the home. Adequate ventilation prevents the buildup of VOCs and increases the thermal comfort of building occupants. Additionally, properly-sized exhaust fans reduce moisture and prevent mold growth. Exhaust fans also prevent carbon monoxide and carbon dioxide buildup within the home.

Definitions

Volatile Organic Compounds (VOCs) – Organic chemical compounds that are able to vaporize at normal room temperatures. Many common construction materials and finishes contain such compounds even though breathing them in vaporized form can contribute to lung tissue damage, reduced lung function, and increased irritant sensitivity.

builders to purchase and install a smaller HVAC system than they would have otherwise, which can have a significant impact on the construction budget.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Specify that the HVAC contractor will size the building's HVAC systems using ACCA Manual J and provide the Manual J calculations.

Benefits to Developers

- *Reduced construction costs* – An accurate account of the heating and cooling loads required for a structure provides a more precise assessment of the required air conditioning tonnage. Many times, this allows

Submission requirements

- Specification sheets that list a requirement for the HVAC contractor to perform Manual J calculations to size the mechanical system prior to installation

Standards Referenced

Air Conditioning Contractors of America – System Design
<http://www.acca.org/design/>

Precedents

LEED NC – EQ Prerequisite 1: Minimum IAQ Performance

Additional Resources

Home Ventilating Institute
<http://www.hvi.org>

Ventilation Technology Review

<http://buildingscience.com/documents/reports>

US Department of Energy – Sizing Heating and Cooling Systems

http://www.energysavers.gov/your_home/space_heating_cooling/index.cfm/mytopic=12340

EPA Energy Star Indoor Air Package

www.energystar.gov/ia/partners/bldrs_lenders_raters/downloads/IAPBuild508.pdf

Building Science Review of Residential Ventilation Technologies

<http://www.buildingscience.com/documents/reports>

Building Systems - Indoor Environment *4 required points / 7 additional points*

P1 - The buildings meet Energy Star requirements- additional points are awarded for earning Energy Star Certification and/or further reducing energy needs and employing innovative energy-saving strategies

Intent

Increase indoor air comfort.

Lower energy demand and air pollution from electricity generation.

Minimize energy bills for occupants.

Of all the methods for increasing the environmental sustainability of a home, increasing energy efficiency is the likely the most familiar. Increasing energy efficiency and thus lowering energy demand have wide-ranging effects on both immediate and long-term economic and environmental issues.

Because coal-fired plants generate most of the Gulf Coast region's electricity, decreased energy demand means fewer pollutants are released into the environment. Additionally, up to 20% of generated electricity is lost in transmission between power plants and consuming structures. This transmission loss can be reduced or eliminated by employing various on-site renewable energy or other innovative strategies. Over the long term, reducing energy demand limits the need for new energy infrastructure and the development of land for that infrastructure.

The US Department of Energy produced the Energy Star standards as a way to balance the need for increased energy efficiency in new construction and construction cost constraints for developers. New Energy Star homes are typically 15% – 30% more energy efficient than typical new construction that complies with the International Energy Conservation Code of 2003 (IECC). Lowering energy demand leads to lower energy bills for homeowners, which increases the long-term affordability of a home.

This standard requires that all appliances and other systems meet the requirements set forth in the Builder Option Package and that the builder complete a Thermal Bypass Inspection Checklist. This standard encourages

but does not require builders to obtain Energy Star Certification. Certification ensures that the buildings are as energy efficient as intended through a verification process- a good option for checking any construction or installation errors. Certification also carries with it the ability to market buildings as having earned the Energy Star label. The developer may choose to use either of the Energy Star compliance paths if they seek certification.

Definitions

Energy Star – A US-EPA-sponsored program that champions energy efficiency. This program certifies appliances, mechanical systems, lighting, and entire buildings that meet certain energy efficiency benchmarks.

Energy Star Compliance Paths – Energy Star has different compliance paths for each type of product that they certify. To earn Energy Star certification for a home, a builder may choose one of two compliance paths- the Performance Path, which measures the actual energy efficiency of a building through tests and computer simulations, or the Prescriptive Path (also called the Builder Option Package), which requires a number of specific improvements that are assumed to meet or exceed Energy Star energy efficiency guidelines without further performance testing.

Innovative Energy-Saving Strategies – These include, but are not limited to geothermal heat pumps, on-site energy production using photovoltaic panels or wind turbines, passive heating/cooling strategies such as thermal masses, solar chimneys, and solar hot water heaters.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions

- Work with an architect or engineer that has experience with Energy Star standards to avoid delays in the planning and construction process.
- Meet the Prescriptive Path requirements of the Energy Star Builder Option Package and Thermal Bypass Inspection Checklist.
- Hire an independent third-party inspector to verify construction techniques and system efficiency during construction to receive Energy Star Certification. (Optional)
- Install renewable, on-site power generation or passive energy-saving technologies. (Optional)

Benefits to Developers

Complying with this standard may offer a developer:

- Improved project marketability- The Energy Star program is, in effect, a marketing tool for developers. Energy Star certification and labeling creates a strong association with energy efficiency and green building for potential homebuyers and renters. Building homes that meet Energy Star requirements allow developers to capitalize on increased consumer interest in green building by using the logos and promotional tools available from the program.
- Improved project marketability – Incorporating energy efficiency as a priority in building design is a major selling point that can attract buyers and renters interested in low energy bills.
- Lowered compliance costs – In some jurisdictions, Energy Star developments are eligible for expedited regulatory processes governing access and rights to land development.

Submission Requirements

- Specification sheets that list insulation products, appliances, lighting fixtures and other items listed on the Builder Option Package.
- Energy Star Thermal Bypass Inspection Checklist with the initials of the party responsible for ensuring compliance with Checklist requirements.
- Information describing measures taken effort to increase building efficiency above and beyond Energy Star requirements, if any.

Standards Referenced

Energy Star

<http://www.energystar.gov>

Precedents

LEED NC –

- EA Prerequisite 1: Minimum IAQ Performance
- EA Credit 1: Outdoor Air Delivery Monitoring
- EA Credit 6: Controllability of Systems: Lighting

Enterprise Green Communities –

- 5-1: Efficient Energy Use: New Construction
- 5-3: Efficient Lighting: Interior
- 5-5: Additional Reductions in Energy Use
- 5-6: Renewable Energy

Additional Resources

Energy Star Home Page

<http://www.energystar.gov>

Energy Star Compliance Paths:

Prescriptive Path (Builder Option Package)

http://www.energystar.gov/ia/partners/bldrs_lenders_raters/downloads/Nat_BOP_Final.pdf

Thermal Bypass Inspection Checklist

http://www.energystar.gov/ia/partners/bldrs_lenders_raters/downloads/Thermal_Bypass_Inspection_Checklist.pdf

Performance Path

http://www.energystar.gov/ia/partners/bldrs_lenders_raters/downloads/PerfPathTRK.pdf

Qualified Energy Star Home Raters

http://www.energystar.gov/index.cfm?fuseaction=new_homes_partners.showHomesSearch

Building Systems - Water Usage *2 required points / 0 additional points*

Q1 - All lavatory faucets, toilets, and showerheads must have the EPA's WaterSense label or meet the flow rate restrictions of the WaterSense program.

Intent

Minimize stress on natural hydrologic systems by lowering water consumption.

Reduce air pollution through reductions in water-related energy consumption.

Installing efficient bathroom fixtures is a cost-effective and environmentally sound strategy that can reduce water and energy consumption. Reducing water consumption minimizes the volume of water withdrawn from rivers, streams, underground aquifers, and other water bodies, which protects habitat and animals that depend on the natural hydrologic cycle,

Reducing water consumption lowers both water bills and energy bills since a smaller volume of water requires less energy for heating and reduces the energy that would otherwise be spent on water extraction.

Reducing water use can also save the taxpayers money; reducing the loads on municipal infrastructure such as water and sewerage lines can lead to decreased maintenance costs and upgrades.

High-efficiency water fixtures have become more common since the creation of the Energy Policy Act of 1992, which regulates water and energy use in commercial, institutional, and residential structures. Many water-conserving fixtures that meet or exceed the requirements of this standard are now readily available.

Definitions

WaterSense – A US-EPA-sponsored program that certifies fixtures that are both high performing and water efficient.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions

- Install toilets, showerheads, and faucets that meet the flow requirements of the WaterSense program or which have the WaterSense label.

Benefits to Developers

Complying with this standard may offer a developer:

- *Added value from lower operation costs* – Water efficient fixtures will have a great impact on the future occupant's water bills. By showing potential buyers or renters the utility savings that come from the installation of these fixtures, they are able to realize the cost savings of purchasing or renting a home with these fixtures.

Submission Requirements

- Specification sheets that list all plumbing fixtures.

Standards Referenced

EPA WaterSense

<http://www.epa.gov/WaterSense/>

Precedents

Enterprise Green Communities

4-1a: Water-Conserving Appliances and Fixtures:
New Construction

4-1c: Water Conserving Appliances and Fixtures

LEED NC – WE Credit 3.1: Water Use Reduction

Additional Resources

"Water – Use It Wisely" Campaign

<http://wateruseitwisely.com>

Building Systems - Water Usage *0 required points / 3 additional points*

Q2 - Collected roof water, site runoff water, or greywater is used for irrigation purposes, if irrigation is necessary.

Intent

Reduce or eliminate the use of potable water for irrigation.

Minimize stress on natural hydrologic systems by lowering water consumption.

Irrigation accounts for 40% of residential water use. Typical irrigation systems use potable water, although non-potable water is equally effective. Using potable water for irrigation depletes aquifer reserves, uses energy during the treatment process, and must be transported from the source to destination.

An alternative way to meet this standard is to install a highly-efficient irrigation system designed and installed by an EPA WaterSense certified landscape professional that incorporates drip irrigation, timers, moisture sensors, and efficient planting strategies.

The use of native plant species for landscaping can reduce water use for irrigation since they can often survive on natural rainfall alone and require less care than more exotic species. Minimizing the amount of turf grass, which can be more difficult to sustain and maintain without dedicated irrigation systems can also reduce water consumption for irrigation.

Definitions

Greywater – Untreated household wastewater which has not come into contact with toilet waste.

Implementation

In order to meet the requirements of this standard, a developer should consider undertaking the following actions:

- Contour the site to direct rainwater runoff through landscaped areas, thus draining the site effectively and irrigating the landscaping simultaneously.
- Install a WaterSense-compliant irrigation system.
- Install systems that collect rainwater for irrigation use. Make this objective clear to the architects during the design phase to give consideration to roof configuration, slope, and guttering.

Benefits to Developers

Complying with this standard may offer a developer:

- *Added value from lower operation costs* – Although the additional design and installation cost of these types of systems may exceed that of conventional systems, it typically has lower maintenance costs and zero water usage costs. This usually leads to a short payback period.

Submission Requirements

- Site plan(s) or landscaping plan showing the types of plants, their locations, their relationships to buildings and walkways, any trees that will be preserved on the site, and irrigation systems.
- Site plan(s) showing storm water drainage patterns, storm water infrastructure, and storm water best management practices, with pre and post-development peak storm water calculations.

Precedents

LEED NC – WE Credit 1.1: Water Efficient Landscaping:
Reduce by 50%

WE Credit 1.2: Water Efficient Landscaping:
No Potable Water Use or No Irrigation

LEED H – WE Credit 2.1: Irrigation System

Enterprise Green Communities – 4-2: Efficient Irrigation

Additional Resources

EPA WaterSense

<http://www.epa.gov/WaterSense/>

American Rainwater Catchment Systems Association

<http://www.arcusa-usa.org>

Glossary

Adaptive reuse – Modification of an existing building for a use that is substantially different from the purpose intended when built. Usually developers undertake an adaptive reuse project because the existing building has architectural elements that are unique or uncommon in new construction, or because the structure has a historic value that is important to the community.

Area Median Income (AMI) – The middle point of area household incomes. Affordable housing programs and projects typically target families who make a certain percentage of the AMI.

Brownfield – A site with the presence of environmental hazards and pollutants. These are often sites where factories and other industrial activities took place in the past but where such activities have now stopped, leaving abandoned or underutilized land. In order for developers to build new uses on the land, they must first contain or remove pollutants in compliance with federal, state, and local standards. The Mississippi Department of Environmental Quality and the United States Environmental Protection Agencies maintain lists of known brownfield sites, as well as information about funding programs designed to subsidize brownfield redevelopment.

Comprehensive Plan – A document created by a community, city, county, or other local government entity that typically lays out future land use, transportation, and other infrastructure investment in that community.

Daylighting – Designing a building's windows and other openings so that occupants can use natural light for illumination rather than artificial lighting as much as possible.

Design Speed – The intended velocity for automobiles travelling on a road. In the traffic planning and engineering professions this speed is a key criterion in the physical design of roads as wider streets allow for high velocities and narrow streets restrict velocity. Note that design speeds can be different from the legal speed limit or the speed at which drivers actually travel.

Dioxins – Properly known as polychlorinated dibenzodioxins, these substances are harmful

compounds that result from various manufacturing and energy production processes. Dioxins are harmful to humans and animals and have been classified as a Group 1 (most serious) carcinogen by the International Agency for Research on Cancer. They are also known to cause potentially lethal effects to the human immune system and harm the reproductive system.

Energy Star – A US-EPA-sponsored program that promotes building energy efficiency. This program certifies appliances, mechanical systems, lighting, and buildings that meet certain, evolving energy efficiency benchmarks.

Energy Star Compliance Paths – Energy Star has different compliance paths for each type of product that they certify. To earn Energy Star certification for a home, a builder may choose one of two compliance paths- the Performance Path, which measures the actual energy efficiency of a building through tests and computer simulations, or the Prescriptive Path (also called the Builder Option Package), which requires a number of specific improvements that are assumed to meet or exceed Energy Star energy efficiency guidelines without further performance testing.

Engineered Wood Products – Building materials Composed of small wood members built up to form a larger whole, thereby reducing the amount of larger, old-growth timber required. Common examples are OSB and engineered joists.

Flush Out – A process used to expel unwanted odors and chemicals from a structure once builders have finished construction but before occupancy. The flush out period can last from several days to several weeks.

Formaldehyde – A compound found in resin binders common to engineered sheet materials such as MDF, OSB, and particle board. Urea-formaldehyde is the worst of several types of binders that have been shown to be significant sources of VOC emissions. There are several strategies to control this dangerous off-gassing, and several types of engineered wood now contain types of formaldehyde binders that do not off gas.

Forest Stewardship Council (FSC) Certified Wood Products – Products certified under the Forest Stewardship Council’s Principles and Criteria. Examples of these materials are structural framing members, flooring, sub-flooring, and wood doors.

Flush Out – A process used to expel unwanted odors and chemicals from a structure once builders have finished construction but before occupancy. The flush out period can last from several days to several weeks.

Greenfield – A site that has not been built on before. Open space, natural habitat and farmland all fall under this category.

Green Label Certification – A program administered by the Carpet and Rug Institute (CRI) to provide information to relating to carpet and its effects on indoor air quality. Two levels of certification are currently available; Green Label and Green Label Plus.

Green Seal – An independent, non-profit organization dedicated to safeguarding the environment and transforming the marketplace by promoting the manufacture, purchase, and use of environmentally responsible products and services. This organizations administers a certification program for various products, including paints, primers, and sealants.

Greywater – Untreated household wastewater which has not come into contact with toilet waste.

Healthful indoor environments – Those that have minimal amounts of harmful volatile organic compounds (VOCs) present, provide comfort and safety to building occupants, and create spaces that are habitable and comfortable.

High-quality wetland – A wetland area that performs well as habitat for wildlife and a variety of native, non-invasive vegetation. High quality wetlands are connected to large areas of undisturbed habitat and receive unpolluted water from surrounding land through hydrology unaltered by humans. The Army Corps of Engineers and qualified biologists determine the level of wetland quality when completing the wetland permitting process.

Impervious surfaces – Paving or coverage on a development site that does not allow water to pass through to the ground underneath. Common asphalt and concrete are examples of such surfaces.

Infill development – A project that builds on land surrounded by other, pre-existing development. Infill development can occur on previously-developed land or on land that was not previously developed but which is surrounded by development. To qualify as infill for the purpose of these standards, 75% of the parcels immediately abutting or within a ½ mile radius of the project boundary must be previously developed. For this definition, a road is not considered as “development” along the project boundary. Instead, consideration is given to the land use across that road from the project.

Local Materials – Building materials extracted, harvested, recovered, and manufactured within 500 miles of the building site.

Lot Coverage – A ratio between the enclosed ground floor area of all structures on a site and the total site area. This differs from floor-to-area ratio (FAR), which is a ratio of the building footprint size to a lot rather than the total building square footage, including multiple stories, to its lot.

Mixed-Income neighborhoods – Areas in which housing options are available for residents whom earn a variety of incomes.

Necessary retail and community services – The following qualify:

Retail

- Convenience store
- Florist
- Hardware store
- Pharmacy
- Supermarket
- Other retail

Services

- Bank
- Coffee shop
- Hair care
- Health club
- Laundry/dry cleaner
- Medical/dental office

- Restaurant
- Homeless shelter

Civic/Community Facilities

- Child care (licensed)
- Civic/community center
- Place of worship in a building
- Police/fire station
- Post office
- Public library
- Public park
- School
- Senior care
- Social services facility

Peak Discharge – The maximum flow of water off of a given site or piece of land at any moment during a storm of a given intensity. The Natural Resource Conservation Service maintains a standard methodology for computing this flow based on information about the site and the storm intensity.

Polyvinyl Chloride (PVC) – A thermoplastic polymer that is rapidly finding more applications in the building industry, despite concerns regarding its toxicity and impact on human and environmental health. PVC has been shown to pose health and environmental risks across its lifecycle, from manufacturing to disposal.

Previously developed site – A site with structures, paving, or other alterations to the natural landscape. Alterations for agriculture, forestry, or use as a natural preserve are not included.

Rapidly Renewable Materials – Materials and products made from plants that are typically harvested within a ten-year cycle. Common examples include bamboo, cotton batt insulation, linoleum flooring, cork flooring, wool carpet, sunflower seed board panels, and wheatboard panels.

Recycled and Salvaged Materials – Materials that have been recovered or diverted from the waste stream. Post-consumer recycled content enters the manufacturing process again to create new materials.

Remediation – The process of removing or containing environmental contamination on or below a piece of land to prevent harm to humans or contamination of natural systems.

Solar Chimney – A structure for venting indoor air to the outside atmosphere, much like a flue or fireplace chimney. Projecting above the roof line, the structure is exposed to the sun and heats the air within which creates an updraft that draws air out of an indoor space and provides passive ventilation. Such chimneys frequently have black-painted exterior surfaces to increase the efficiency of air heating.

Urban areas – For the purposes of this standard, a cluster of one or more block groups or census blocks, each of which has a population density of at least 1,000 people per square mile, and surrounding block groups and census blocks, each of which has a population density of at least 500 people per square mile at the time, and less densely settled blocks that form enclaves or indentations, or which connect discontinuous areas with qualifying densities.

Urban heat island effect – A condition where the reflection of sunlight off of paved surfaces and buildings increases the local air temperature. Meteorological studies of areas with extreme sprawl, such as metropolitan Atlanta, GA, have shown that the urban heat island effect can alter precipitation patterns.

Vehicle miles traveled (VMT) – A common measure of driving that describes the distance that an automobile travels regardless of the number of passengers in the vehicle. Household vehicle miles travelled is the sum of the distance that the occupants of a home drive in all of its automobiles. Weekday values are frequently recorded separately from weekend values to describe the higher number of automobile trips associated with commuting to work.

Volatile Organic Compounds (VOCs) – Organic chemical compounds that are able to vaporize at normal room temperatures. Many common construction materials and finishes contain such compounds even though breathing them in vaporized form can contribute to lung tissue damage, reduced lung function, and increased irritant sensitivity.

WaterSense – A US-EPA-sponsored program that certifies fixtures that are both high performing and water efficient.

Wetland – The federal government defines wetlands in the Code of Federal Regulations 40 CFR, Part 230, Section 41 as “[t]hose areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.”

Acronyms

ASHRAE – American Society of Heating, Refrigeration, and Air Conditioning Engineers, which provides guidance on construction activities related to HVAC systems and operational requirements of the systems once installed.

ANSI – American National Standards Institute

CNU – Congress for the New Urbanism

D-FIRM – Digital Flood Insurance Rate Map.

DOE – Department of Energy

EPA – Environmental Protection Agency

FEMA – Federal Emergency Management Agency

FSC – Forest Stewardship Council

LEED – Leadership in Energy and Environmental Design

LEED NC – LEED for New Construction

LEED ND – LEED for Neighborhood Development

USGBC – United States Green Building Council