



Green Building Standards

Dallas / Fort Worth International Airport

TABLE OF CONTENTS

SECTION 1	Overview	3
	Introduction	
	DFW Sustainability Program	
	GBS Intent	
	GBS Development	
	GBS and Project Development	
	GBS Structure	
SECTION 2	Applicability and Administration	7
	Applicability	
	Compliance Paths - Types of Projects	
	Request for GBS Variance	
	GBS Project Compliance Path Flowchart	
	LEED Rating System Version	
	Codes and Regulations	
	Submissions	
	Review Process	
	Scoring and Rating	
	Compliance Certificate	
SECTION 3	Green Building Standards Checklist	11
	Introduction	
	Types of Credits	
	Green Building Standard Checklist	
SECTION 4	DFW Baseline Credits	14
	Introduction	
	DFW Baseline Credits	
SECTION 5	Submission Templates	24
	Introduction	
	Green Building Standard Worksheet Guidance	
	Project Description Form	
	Green Building Standard Worksheet	

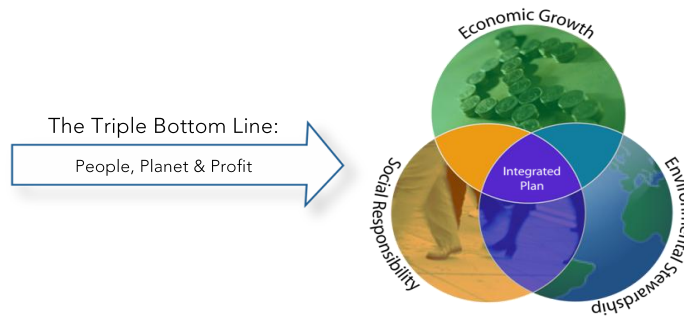
SECTION 1 Overview

Introduction

Dallas/Fort Worth International Airport (DFW) opened in 1974 and covers 29.8 square miles. DFW is the 3rd largest airport worldwide in terms of operations and 7th largest in terms of passenger volume. In addition to 5 terminals, a SkyLink, commercial centers, warehouses, offices, and hotels, the airport currently has 7 active runways and 174 gates. There are approximately 60,000 on-airport employees and a total economic output of \$16.6 billion is generated. In short, DFW is a major operation with ample opportunity to implement green building design. Though DFW has been executing sustainable best management practices for years, they have recently decided to formally adopt a structured sustainability program.

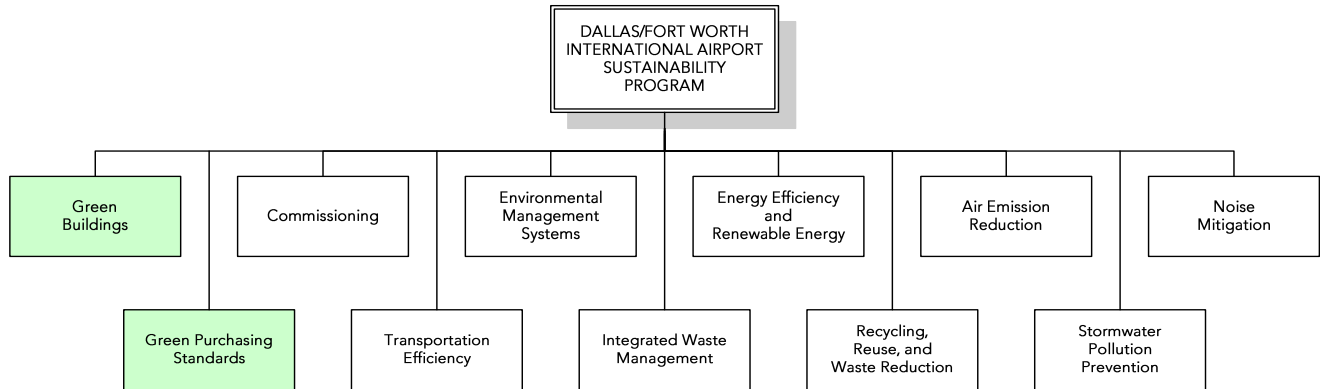
DFW Sustainability Program

In August 2008, DFW Airport launched an airport-wide Sustainability Policy and Program under the auspices of DFW’s Executive Vice President Operation’s Division. DFW’s Sustainability Initiative is a key element in the Airport’s Strategic Plan designed to positively affect the environment, the community, the Airport and its employees. DFW’s Sustainability Initiative is about being environmentally friendly and being a strong corporate and community partner. Sustainability is a business approach that seeks to understand and balance economic, environmental and social objectives.



In order to implement DFW’s Sustainability Initiative, a Green Building Team was assembled that established various focus areas in order to successfully implement sustainability throughout all airport activities.

DFW Sustainability Program



This document, called the Green Building Standards (GBS), is the product of the work undertaken in the Green Buildings focus area. To aid the development of this work, the GBS Task Force (a subgroup of the Green Building Team) developed the following Charter Statement:

This interdepartmental group of stakeholders shall develop a “Green Building Program” for DFW Airport that: a) governs the design and construction of facilities constructed on Airport property, b) supports the Airport’s comprehensive sustainability strategy, and c) demonstrates the Airport’s commitment to environmental stewardship by utilizing “Best Business Practices” to effectively reduce the Airport’s consumption of natural resources.

GBS Intent

The Green Building Standards (GBS) was developed to provide project teams with sustainable design guidelines for infrastructure, interior/small renovation, major renovation, and new facilities. This document is intended to be used in conjunction with DFW’s “Design Criteria Manual”. All Board-controlled projects will implement the GBS. The GBS is not expected to be applied to Ground Lease Tenant projects and it is DFW’s intention to issue separate guidelines for these projects at a later date.

By developing a rigorous GBS framework, DFW will be able to measure and report over time on the implementation of sustainable design strategies at the airport.

GBS Development

The GBS was developed using the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) 2009 for Green Building Design and Construction rating system as the core standard. As the predominant market-based green building rating system in the U.S., LEED provides an internationally accepted and recognizable benchmark for sustainable design performance. Further, the following airport-specific guidelines were evaluated as notable airport sustainable design guidelines:

- Chicago Department of Aviation Sustainable Airport Manual (SAM)
- Los Angeles World Airports Sustainable Airport Planning, Design and Construction Guidelines
- Port Authority of New York and New Jersey (PANYNJ) Sustainable Design Guidelines

It is the deliberate intention that for all the LEED credits identified in the GBS, project teams will utilize the LEED Reference Guide and comply with the credit intent and requirements. The GBS also expressly goes beyond LEED by increasing the number of 'required' credits within the LEED system, and creating DFW Baseline Credits that emphasize sustainable project leadership, innovative design, and sustainable construction practices.

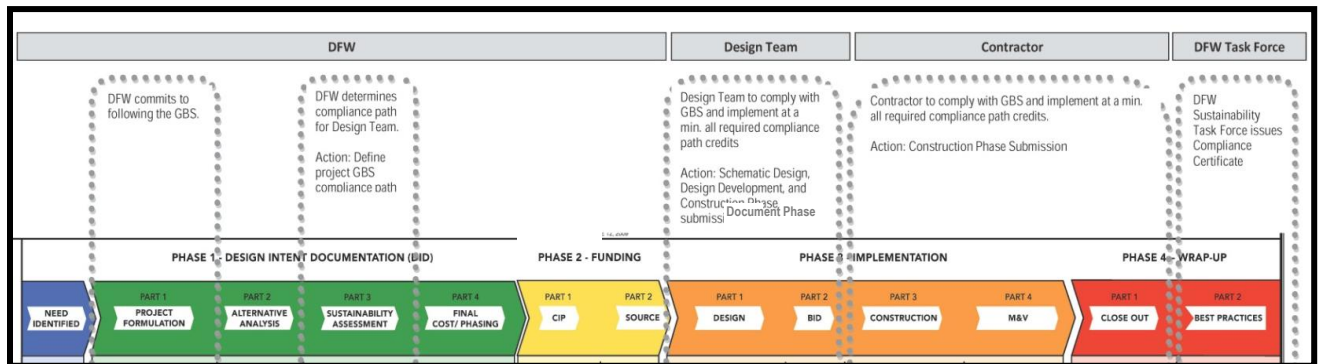
Within the GBS, four (4) compliance paths were established to reflect the wide-ranging types of projects that are typically undertaken at DFW Airport. Definitions and example projects are provided in Section 2 to assist project teams to correctly identify the appropriate compliance path for a project.

Document Title: Green Building Standards

GBS and Project Development

The graphic below shows how the GBS process compliments the phases presented in the Project Development Procedure (PDP). The PDP is currently being developed by DFW as an integrated approach to sustainable airport development.

The top bar indicates the project team member that is responsible for implementing the GBS at the different phases of a project. The dashed boxes overlay the PDP process to identify the key actions during each phase.



Project Development Procedure (process portion only) produced by DFW with GBS overlay

GBS Structure

The GBS provides 5 succinct sections that steer a project team through the use of the GBS and the administrative procedures required to demonstrate GBS compliance.

- Section 1 presents DFW’s sustainability objectives and introduces the Green Building Standards, including the document intent, development, and structure.
- Section 2 presents the GBS applicability and administration for project teams to successfully comply with the process and documentation, including how to determine which compliance path should be followed for different types of projects.
- Section 3 presents the GBS Checklist, which includes the compliance path for all four (4) types of projects and defines which credits are required and optional.
- Section 4 presents the definition of all eight (8) required DFW Baseline Credits including credit intent, requirements, and documentation guidance.
- Section 5 provides the required submission forms and templates that will be completed by the design and construction teams.

SECTION 2 Applicability and Administration

Applicability

All DFW Board-controlled projects must comply with the GBS and four compliance paths have been established to encompass the various types and sizes of projects that will be initiated. It is the responsibility of DFW to determine the appropriate compliance path during the Design Intent Documentation (DID) phase.

Compliance Paths – Types of Projects

The four project definitions are as follows.

- **Infrastructure (20 Required Credits):** Infrastructure is defined as flat/civil engineering work and includes landscaping and utilities. *Examples: Runway paving, tree planting, surface parking, apron, waiting areas, park, etc.*
- **Interior/Minor Renovation (30 Required Credits):** Interior and Minor Renovation projects are defined as projects where the scope of work either i) mainly comprises furniture, fixtures and equipment (FF&E) alterations, changes or upgrades, or ii) includes the replacement of up to two (2) system upgrades out of HVAC, electrical, plumbing and envelope upgrades. *Examples: Office reconfiguration, conference room remodeling, interior painting, ticket counter remodels, flooring, lighting upgrades, bathroom remodels, chiller replacement, window replacements, etc.*
- **Major Renovation (45 Required Credits):** Major Renovation is defined as the replacement of more than two (2) systems out of HVAC, electrical, plumbing, significant envelope modifications and major interior rehabilitation. *Examples: Gut-rehab of terminal building, office building upgrade, etc.*

For major renovation projects that meet the LEED 2009 Minimum Program Requirements, the project team shall consider pursuing LEED certification.

- **New Facility (50 Required Credits):** New Facility is defined as either a new building or a building addition or expansion. *Examples: New terminals, warehouses, distribution centers, control towers, information booths, fire stations, etc.*

For new facility projects that meet the LEED 2009 Minimum Program Requirements, the project shall achieve LEED-Silver certification.

Request for GBS Variance

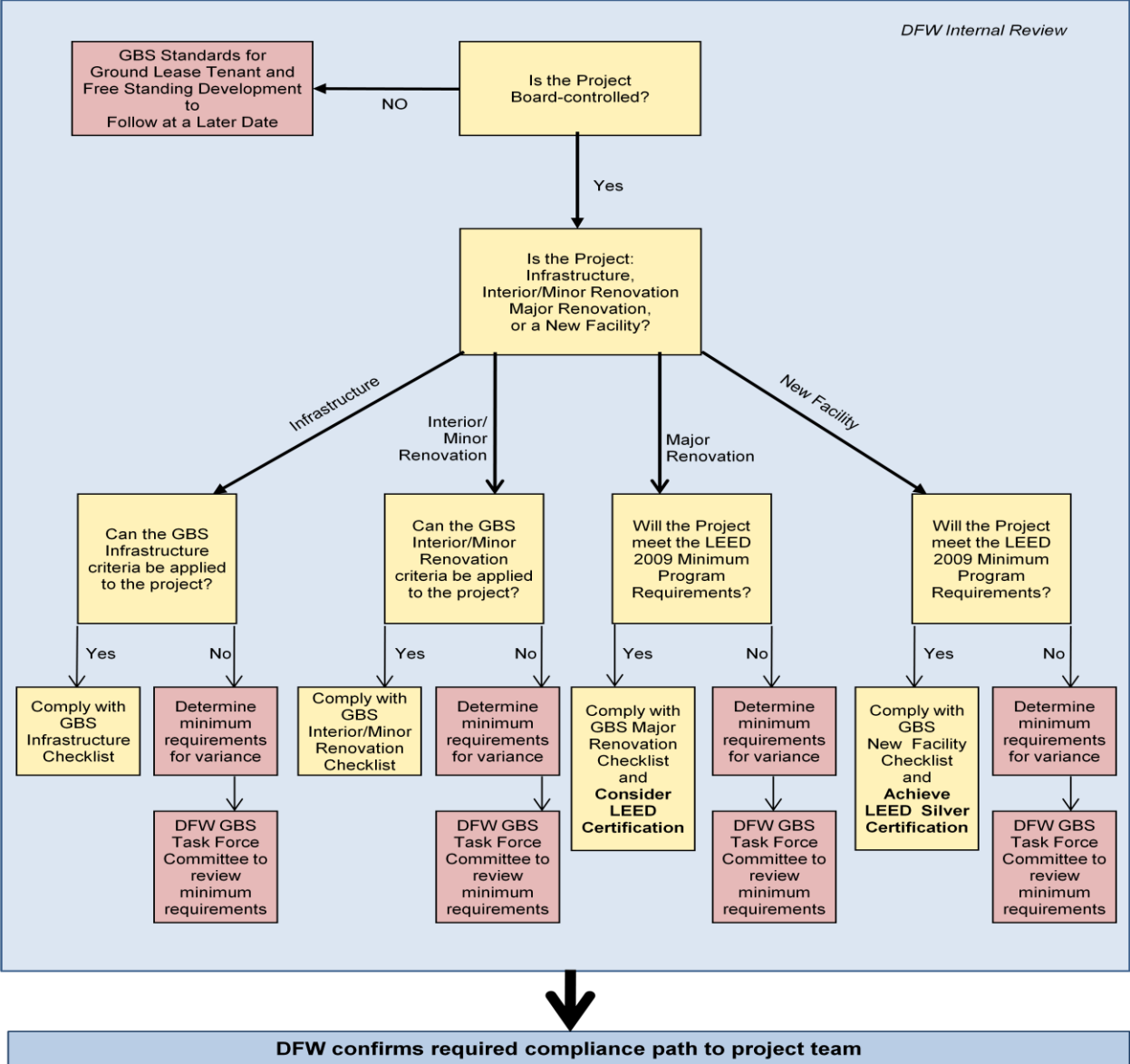
If it is determined that a GBS compliance path is not feasible, the project team can submit a variance application to the DFW GBS Task Force. The variance application shall include:

- Project scope and budget
- Reasons why each GBS required credit cannot be achieved

The DFW GBS Task Force will evaluate the application and issue a variance that will include confirmation of which credits, if any, the project is required to achieve.

GBS Project Compliance Path Flowchart

The following flow chart is provided to guide DFW’s decision-making process to determine the appropriate compliance path for each project.



LEED 2009 Minimum Program Requirements can be obtained at: <http://www.gbci.org/DisplayPage.aspx?CMSPageID=130>
 There are 7 requirements. 1) Must comply with environmental laws, 2) Must be a complete, permanent building or space, 3) Must use a reasonable site boundary, 4) Must comply with minimum floor area requirements (>1,000sqft), 5) Must comply with minimum occupancy rates (>1 FTE), 6) Must commit to sharing whole-building energy and water usage data, 7) Must comply with a minimum building area to site area ratio (gross floor area of the LEED project must be > 2% of gross land area within the LEED project boundary).

LEED Rating System Version

If the LEED rating system is updated or amended, the version that is current at the time of Design Intent Documentation (DID) shall be used. If the project team believes it is more favorable to utilize a later LEED version, during project development, the DFW GBS Task Force must be notified.

Codes and Regulations

The GBS shall not supersede any federal, state and local code or regulatory requirements.

Submissions

All submissions shall be emailed to the DFW GBS Task Force. Submissions are required at the completion of the following design milestones:

- Schematic Design
- Design Development
- Construction Documents
- Construction Phase

At each submission, the Project Team must submit/update the following documents (templates for both have been provided in Section 5):

- Project Description Form
- DFW GBS Worksheet

For LEED Projects: Regardless of whether or not the project pursues formal LEED certification, the GBS Worksheet must be completed for the Schematic Design and Design Development phases. For those credits that will be achieved through the LEED process, note in the Construction Documents and Construction Phase phases: "SEE LEED DOCUMENTATION".

Questions related to the GBS shall be emailed to the DFW GBS Task Force.

Review Process

The DFW GBS Task Force will review each submission and provide comments. The DFW GBS Task Force has two (2) weeks to provide comments/questions. If there are follow up actions, the design team will need to address each follow up action within one (1) week of issue. No confirmation of GBS compliance will be issued until completion of the project and all outstanding issues have been closed out.

Scoring and Rating

The GBS Checklist identifies all the credits that a project must achieve, which are denoted as 'Required'. The number of required credits varies in each of the four compliance paths to reflect the different opportunities available to different types and scales of projects. Each project must achieve all the required credits. It is at the discretion of the project team whether or not to pursue additional credits that are denoted in the Checklist as 'Optional'.

Document Title: Green Building Standards

A project is compliant with the GBS when all required credits are achieved. There is no tiered rating system within the checklist. However, the Certificate of Compliance will indicate how many required and optional credits were achieved.

Compliance Certificate

After the Construction Phase submission is submitted and approved by the DFW GBS Task Force, a Certificate of Compliance will be issued (combining the design and construction of a project). The Certificate of Compliance will mark the achievement of environmental design and construction excellence as set forth by the DFW Green Building Standards.

The Certificate will indicate the number of achieved required credits out of the total number of required credits and will highlight where the project team has exceeded these requirements by achieving further optional credits. For example, an infrastructure project might achieve 17 out of the 20 required credits, plus 5 optional credits.

SECTION 3 Green Building Standards Checklist

Introduction

The DFW Green Building Standards (GBS) Checklist provides an overview of all the GBS sustainable design credits for each of the project type compliance paths, denoting which credits are required or optional.

There are four (4) project type compliance paths, which are defined in Section 2:

- Infrastructure (20 Required Credits)
- Interior/Minor Renovation (30 Required Credits)
- Major Renovation (45 Required Credits)
- New Facility (50 Required Credits)

The checklist is intended to be used as a framework for design teams to implement sustainable design on projects. There are a total of 64 credits that are either “required” or “optional”. The number of required credits varies depending on the project compliance path. However, sustainable design opportunities shall not be limited to the required credits only, and design teams are encouraged to evaluate the optional credits, as well as explore additional sustainable design opportunities, on all projects.

An example of the GBS checklist can be found on the following page. Forms can be acquired from the Skire/Unifier Document Manager location.


Types of Credits

- DFW Baseline Credits were developed to address specific airport sustainable design issues. The intent and requirements for each DFW credit is explained in Section 4. All DFW Baseline credits are required for all projects.
- DFW Requirements based on LEED 2009 are credits referenced directly from the LEED 2009 for Green Building Design and Construction rating system. In order to demonstrate compliance with these credits, project teams are required to follow the intent and requirements in accordance with the LEED Reference Guide. Formal LEED certification is only required for New Facility projects, but encouraged for Major Renovation projects.

LEED 2009 introduced Regional credits to highlight geographically significant environmental issues. There are 6 regional credits that have been identified next to the relevant credits in italics. Special attention should be given to achieving these credits.

- Required/Optional Credits
 - Required Credits “R” are credits that DFW has identified as being of particular importance, which include LEED prerequisite credits, and should be implemented on every project. It is understood that some projects, due to project scope or location, will not be able to achieve all required credits or that some credits may not be applicable. In these instances the Project Team shall include in the GBS Worksheet an explanation of why compliance was not possible.
 - Optional Credits “O” are credits that the Design Team will evaluate on a project by project basis and will implement where feasible.

Document Title: Green Building Standards



Document Title: Green Building Standard Checklist
Version Date: 03/31/11

Credit		GBS Checklist Compliance Paths Required (R) / Optional (O)				Equivalent LEED 2009 Pts
		Infrastructure	Interior/ Minor Renovation	Major Renovation	New Facility	
DFW Baseline Credits						
DFW 1	Green Meetings	R	R	R	R	n/a
DFW 2	Sustainability Liaison	R	R	R	R	n/a
DFW 3	Integrated Design	R	R	R	R	n/a
DFW 4	Water Management Plan	R	R	R	R	n/a
DFW 5	Energy Management Plan	R	R	R	R	n/a
DFW 6	Material Durability	R	R	R	R	n/a
DFW 7	Acoustics and Noise	R	R	R	R	n/a
DFW 8	Construction Practices	R	R	R	R	n/a
DFW Requirements based on LEED 2009						
Sustainable Sites						
Prereq 1	Construction Activity Pollution Prevention	R	R	R	R	Prereq
Credit 1	Site Selection	O	O	O	O	1
Credit 2	Development Density and Community Connectivity	O	O	O	O	5
Credit 3	Brownfield Redevelopment (<i>Regional Credit</i>)	O	O	O	O	1
Credit 4.1	Alternative Transportation-Public Transportation Access	O	O	O	R	6
Credit 4.2	Alternative Transportation-Bicycle Storage and Changing Rooms	O	O	O	R	1
Credit 4.3	Alternative Transportation-Low-Emitting and Fuel-Efficient Vehicles	O	O	O	R	3
Credit 4.4	Alternative Transportation-Parking Capacity	O	O	O	O	2
Credit 5.1	Site Development-Protect or Restore Habitat (<i>Regional Credit</i>)	R	O	O	R	1
Credit 5.2	Site Development-Maximize Open Space	O	O	O	O	1
Credit 6.1	Stormwater Design-Quantity Control (<i>Regional Credit</i>)	R	O	R	R	1
Credit 6.2	Stormwater Design-Quality Control (<i>Regional Credit</i>)	R	O	R	R	1
Credit 7.1	Heat Island Effect-Non-roof	R	O	R	R	1
Credit 7.2	Heat Island Effect-Roof	O	R	R	R	1
Credit 8	Light Pollution Reduction	R	R	R	R	1
Water Efficiency						
Prereq 1	Water Use Reduction-20% Reduction	O	R	R	R	Prereq
Credit 1.1 - 1.2	Water Efficient Landscaping (Reduce by 50%, No Potable Water Use or Irrigation)	R At least 50%	O	R At least 50%	R At least 50%	2 to 4
Credit 2	Innovative Wastewater Technologies	O	O	O	O	2
Credit 3.1 - 3.3	Water Use Reduction - Reduce by 30%, 35%, 40%	O	O	R At least 30%	R At least 40%	2 to 4
Energy and Atmosphere						
Prereq 1	Fundamental Commissioning of Building Energy Systems	O	R	R	R	Prereq
Prereq 2	Minimum Energy Performance	R	R	R	R	Prereq
Prereq 3	Fundamental Refrigerant Management	O	R	R	R	Prereq
Credit 1.1-1.19	Optimize Energy Performance	O	O	R At least 10%	R At least 20%	1 to 19

Document Title: Green Building Standards



Document Title: Green Building Standard Checklist
Version Date: 03/31/11

Credit 2.1-2.7	On-Site Renewable Energy (1%, 3%, 5%, 7%, 9%, 11%, 13%) <i>(Regional Credit)</i>	O	O	O	R At least 1%	1 to 7
Credit 3	Enhanced Commissioning	O	O	R	R	2
Credit 4	Enhanced Refrigerant Management	O	O	O	O	2
Credit 5	Measurement and Verification	O	O	R	R	3
Credit 6	Green Power	O	O	O	O	2
Materials and Resources						
Prereq 1	Storage and Collection of Recyclables	O	R	R	R	Prereq
Credit 1.1-1.3	Building Reuse-Maintain Existing Walls, Floors, and Roof (Reuse 55%, 75%, 95%)	O	O	R At least 55%	O	1 to 3
Credit 1.4	Building Reuse-Maintain 50% of Interior Non-Structural Elements	O	O	R	O	1
Credit 2.1-2.2	Construction Waste Management (50%, 75% Recycled or Salvaged) <i>(Regional Credit)</i>	R At least 75%	R At least 75%	R At least 75%	R At least 75%	1 to 2
Credit 3.1, 3.2, 3.3	Materials Reuse (Reuse 5%, 10%)	O	O	O	O	1 to 2
Credit 4.1-4.2	Recycled Content (10%, 20% of Content)	R At least 20%	R At least 10%	R At least 20%	R At least 20%	1 to 2
Credit 5.1-5.2	Regional Materials: 10, 20% of materials (10%, 20% of Materials)	R At least 20%	R At least 10%	R At least 20%	R At least 20%	1 to 2
Credit 6	Rapidly Renewable Materials	O	O	O	O	1
Credit 7	Certified Wood	O	R	R	R	1
Indoor Environmental Quality						
Prereq 1	Minimum Indoor Air Quality Performance	O	R	R	R	Prereq
Prereq 2	Environmental Tobacco Smoke (ETS) Control	O	R	R	R	Prereq
Credit 1	Outdoor Air Delivery Monitoring	O	O	R	R	1
Credit 2	Increase Ventilation	O	O	O	O	1
Credit 3.1	Construction IAQ Management Plan-During Construction	R	R	R	R	1
Credit 3.2	Construction IAQ Management Before Occupancy	O	R	R	R	1
Credit 4.1	Low-Emitting Materials-Adhesives and Sealants	O	R	R	R	1
Credit 4.2	Low-Emitting Materials-Paints and Coatings	O	R	R	R	1
Credit 4.3	Low-Emitting Materials-Flooring Systems	O	R	R	R	1
Credit 4.4	Low-Emitting Materials-Composite Wood and Agrifiber Products	O	R	R	R	1
Credit 5	Indoor Chemical Pollutant Source Control	O	O	R	R	1
Credit 6.1	Controllability of Systems-Lighting	O	R	R	R	1
Credit 6.2	Controllability of Systems-Thermal Comfort	O	R	R	R	1
Credit 7.1	Thermal Comfort-Design	O	O	R	R	1
Credit 7.2	Thermal Comfort-Verification	O	O	R	R	1
Credit 8.1	Daylight and Views-Daylight	O	O	O	R	1
Credit 8.2	Daylight and Views-Views	O	O	O	R	1
Innovation and Design Process						
Credit 1.1-1.5	Innovation in Design: Specific Title	O	O	O	O	5
Credit 2	LEED Accredited Professional	O	O	R	R	1
Number of DFWGBS Required Credits		20	30	45	50	
Total Number of Required and Optional Credits		64	64	64	64	

Revision: 001
Document Number: FRM-031

Page 2 of 2

SECTION 4 DFW Baseline Credits

Introduction

DFW has established eight (8) airport-specific credits. These required credits have been included in the GBS to emphasize sustainable project leadership, innovative design, and sustainable construction practices.

DFW Baseline Credits

All projects that comply with the GBS are required to achieve all of the DFW baseline credits which are as follows:

DFW 1	Green Meetings
DFW 2	Sustainability Liaison
DFW 3	Integrated Design
DFW 4	Water Management Plan
DFW 5	Energy Management Plan
DFW 6	Material Durability
DFW 7	Acoustics and Noise
DFW 8	Sustainable Construction Practices

Definitions for each credit, including the credit intent, requirements, and documentation guidance, are provided in the following pages.

DFW 1: Green Meetings

Project Type	Infrastructure	Interior / Minor Renovation	Major Renovation	New Facility
Points	Required	Required	Required	Required
LEED Equivalent	n/a	n/a	n/a	n/a

Intent

To incorporate environmental considerations into the planning and conduct of meetings to minimize negative impacts on the environment.

Requirements

Where feasible, comply with the following green meeting requirements:

- Print all documents double-sided
- Utilize web-conferencing
- Minimize number of handouts
- Utilize recycled paper for printing
- Print in draft mode
- Use Video/phone conferences where feasible
- Promote public transport/carpool to meetings
- Recycle documents that are thrown away
- Engage with local companies for food/beverage services

Documentation Guidance

Provide a narrative to document all Green Meeting efforts in the GBS Worksheet for the following submission phases:

- Schematic Design
- Design Development
- Construction Documents
- Construction Phase

Document Title: Green Building Standards

DFW 2: Sustainability Liaison

Project Type	Infrastructure	Interior / Minor Renovation	Major Renovation	New Facility
Points	Required	Required	Required	Required
LEED Equivalent	n/a	n/a	May contribute to LEED Innovation Credit	May contribute to LEED Innovation Credit

Intent

To ensure that sustainable design is implemented throughout the project during the design and construction phases of the project.

Requirements

Designate a Sustainability Liaison during both the design and construction phases of the project.

Design Sustainability Liaison:

- Individual is part of the Design Team
- Leads all Integrated Design Meetings
- Encourages Green Meetings
- Point Person for sustainability questions
- Must be familiar with the LEED rating system

Construction Sustainability Liaison:

- Individual is part of the Contractor Team
- Obtain the GBS Worksheet completed during the design phase
- Leads the Contractor Sustainability Liaison Meeting
- Encourages Green Meetings
- Develop contractor templates to track sustainability compliance for all LEED Material and Resource credits (i.e. VOC levels, recycled content, regional materials)
- Tracks all GBS contractor-driven credits to ensure compliance
- Point Person for sustainability questions
- Must be familiar with the LEED rating system

Documentation Guidance

Sustainability Liaison completes and submits the GBS Worksheet at the end of each phase:

- Schematic Design
- Design Development
- Construction Documents
- Construction Phase

Make a record in the GBS Worksheet if the Sustainability Liaison changes.

DFW 3: Integrated Design Meetings

Project Type	Infrastructure	Interior / Minor Renovation	Major Renovation	New Facility
Points	Required	Required	Required	Required
LEED Equivalent	n/a	n/a	May contribute to LEED Innovation Credit	May contribute to LEED Innovation Credit

Intent

To bring together all project stakeholders early on in the design process so that everyone is aware of the sustainability goals and project decisions can be made jointly and more efficiently.

Requirements

Hold at least one integrated design meeting, which includes the attendance of the entire design team (architect, electrical, mechanical, civil, structural engineers, landscape architect, commissioning authority, energy modeler, etc.) and all relevant stakeholders (DFW planning staff, facility managers, construction manager, contractor, etc.), at the beginning of each design phase and the construction phase.

All integrated design meetings shall be led by the Sustainability Liaison. The following tasks shall be undertaken during each of the phases:

Schematic Design

Discuss and identify project-specific sustainable design opportunities. Use the GBS Checklist as a framework for discussion.

Design Charette: Conduct at least one integrated design workshop with the full project team. The goal of the workshop shall be to optimize the integration of green strategies across all aspects of the building design, drawing on the expertise of all participants.

Design Development

Discuss and identify all of the sustainable design opportunities that will be implemented on the project. Assign a design team member to implement each credit that the project will pursue. Also discuss the required credits that cannot be achieved and provide an explanation for why the required credits are not applicable or not feasible.

Construction Documents

Discuss and ensure that all of the sustainable design criteria are implemented into the plans and specifications.

Construction Phase

Discuss how sustainable construction will be implemented and how GBS compliance will be monitored throughout construction.

Document Title: Green Building Standards

Documentation Guidance

Document the dates of all Integrated Design meetings in the GBS Worksheet for the following submission phases:

- Schematic Design
- Design Development
- Construction Documents
- Construction Phase

DFW 4: Water Management Plan

Project Type	Infrastructure	Interior / Minor Renovation	Major Renovation	New Facility
Points	Required	Required	Required	Required
LEED Equivalent	n/a	n/a	n/a	n/a

Intent

To develop a water plan to evaluate the water and wastewater supply and demand of the project to understand and coordinate any synergistic opportunities to reduce and/or reuse water.

Requirements

Develop a Water Management Plan that addresses the following:

1. Identify all water demands:
 - Flush Fixtures
 - Flow fixtures
 - Irrigation
 - Cooling tower
 - Janitors sink
 - Showers
 - Others

2. Identify all potential water sources:
 - Graywater from flow fixtures
 - Reclaimed Water
 - Stormwater runoff
 - Municipal water
 - Others

3. Identify opportunities for water use reduction, capture, on-site treatment, and reuse.

4. Evaluate feasibility of implementing water reduction, capture, on-site treatment, and reuse strategies.

Document Title: Green Building Standards

Documentation Guidance

Submit the Water Management Plan with the Design Development Phase submission only.

DFW 5: Energy Management Plan

Project Type	Infrastructure	Interior / Minor Renovation	Major Renovation	New Facility
Points	Required	Required	Required	Required
LEED Equivalent	n/a	n/a	n/a	n/a

Intent

To develop an energy plan to evaluate the energy use of all of the building systems to understand if there are opportunities to reduce energy consumption, identify available sources of energy and set future energy reduction targets.

Requirements

Develop an Energy Management Plan that addresses the following:

1. Identify all energy consuming systems. At a minimum:
 - HVAC & Refrigeration
 - Lighting (interior and exterior)
 - Domestic Hot water systems
 - Renewable energy systems (if applicable)
 - Baggage systems
 - Vertical transportation
 - Others
2. Identify opportunities for energy use reduction such as:
 - Lighting and Daylighting Controls
 - Building energy management system / controls
 - High efficiency equipment
 - Others
3. Consideration of purchased off-site green power.
4. Consideration of installing on-site renewable energy systems.
5. Understanding of baseline energy consumption, and establishment of annual energy saving targets for next 5 years.
6. Consideration of Preventative Maintenance and Operation & Maintenance procedures

Documentation Guidance

Submit the Energy Management Plan with the Design Development Phase submission only.

DFW 6: Material Durability

Project Type	Infrastructure	Interior / Minor Renovation	Major Renovation	New Facility
Points	Required	Required	Required	Required
LEED Equivalent	n/a	n/a	May contribute to LEED Innovation Credit	May contribute to LEED Innovation Credit

Intent

To evaluate the use of more durable, longer lasting materials and finishes to extend building life and reduce maintenance and replacement requirements.

Requirements

Develop a list of primary permanent building and finish material options and identify the factors that contribute to their durability. In particular, when less durable materials are chosen, explain the factors that have influenced this decision.

Evaluation should include:

- Expected life of material
- Affordability
- Availability
- Use of industry standard forms and sizes
- Replacement considerations
- Non-custom materials
- Operation & Maintenance considerations
- Contribution to sustainability of project (i.e. recycled, renewable, local materials)

Documentation Guidance

Document all materials options for the project and their durability considerations for the following submission phases:

- Schematic Design
- Design Development
- Construction Documents

DFW 7: Acoustics and Noise

Project Type	Infrastructure	Interior / Minor Renovation	Major Renovation	New Facility
Points	Required	Required	Required	Required
LEED Equivalent	n/a	n/a	May contribute to LEED Innovation Credit	May contribute to LEED Innovation Credit

Intent

To improve the acoustics and noise levels in buildings to enhance indoor environmental quality for staff and passengers.

Requirements

- Design building envelope to diminish external sources of noise and vibration
- Locate mechanical equipment rooms away from occupied spaces
- Design interior separations to minimize transfer of noise
- Utilize dampening equipment to minimize noise
- Specify sound attenuation materials

Documentation Guidance

Provide a narrative in the GBS Worksheet on how the design/modifications have contributed to noise abatement for the following submission phases:

- Design Development
- Construction Documents

DFW 8: Sustainable Construction Management Plan

Project Type	Infrastructure	Interior/Minor Renovation	Major Renovation	New Facility
Points	Required	Required	Required	Required
LEED Equivalent	n/a	n/a	n/a	n/a

Intent

To ensure that sustainable construction practices are implemented to minimize pollution, noise, and vibration from construction activities and vehicles.

Requirements

In addition to achieving the Construction Activity Pollution Prevention credit (LEED SS Prerequisite 1) and Construction Waste Management credit (LEED MR 2.1-2.2), prepare a Sustainable Construction Management Plan that highlights all additional sustainable construction practices that will be implemented. The plan should consider the following best management practices:

Construction Practices

- Identify a Sustainability Liaison to track construction sustainable practices (DFW 2)
- Develop and implement sustainable construction training
- Implement an Integrated Pest Management plan
- Reduce potable water use during construction (e.g. use recycled water for vehicle wheel washing)
- Recycle and reuse temporary construction materials
- Evaluate earthwork storage and reuse opportunities
- Reduce construction light pollution and use energy efficient temporary lighting
- Purchase energy star appliances for all field offices
- Promote alternative fuel vehicles for contractor on-road vehicles
- Promote construction staff carpool programs
- Implement noise reduction strategies from temporary construction practices (interior and exterior noise)

Construction Vehicles

- Implement diesel retrofit technology where practicable on non-road construction equipment in accordance with EPA diesel retrofit recommendations
- Limit unnecessary idling times on diesel powered engines to 3 minutes
- Limit non-road diesel equipment of 60hp or greater to utilize ultra low sulfur diesel fuel (limit sulfur levels to 15ppm)
- Promote the use of biodiesel where feasible
- Promote the use of low-emission construction vehicles (e.g. diesel-electric hybrid vehicles)

Document Title: Green Building Standards

Documentation Guidance

Provide a narrative to document sustainable construction efforts in the GBS Worksheet during the following submission phases:

- Design Development and Construction Documents – The design team shall identify recommended sustainable construction practices and include in specifications
- Construction Phase – The contractor shall prepare a Sustainable Construction Management Plan that highlights all implemented sustainable construction practices

SECTION 5 Submission Templates

Introduction

For each project, the designated Sustainability Liaison is required to complete and submit the following documents at the end of each design milestone:

1. Project Description Form
2. Green Building Standard Worksheet

The completed Project Description Form and the Green Building Standard Worksheet shall be submitted to the DFW GBS Task Force for review, comments, and approval.

Templates can be obtained electronically within the Document Manager section of Skire/Unifier.

GBS Worksheet Guidance

In summary, each milestone will require the following portion of the GBS Worksheet to be completed:

Schematic Design Identify Sustainable Design Opportunities

Task: Complete DFW checklist and identify the possible achievement of credits (Yes, Maybe, No, n/a).

Design Development Implement Opportunities

Task: For all 'yes' credits, provide a brief description of how the credit will be implemented. If a required credit (R) cannot be achieved, provide an explanation of non-compliance.

Construction Documents Provide narrative/drawing/specification reference

Task: For all 'yes' credits, provide a brief narrative of how the credit has been implemented or reference the relevant specification section or drawing to confirm implementation. If a required credit (R) cannot be achieved, provide a brief explanation of non-compliance.

Construction Phase Verify Sustainable Construction

Task: For all 'yes' credits, track and monitor credits implemented during the construction phase. Provide evidence (calculations, narratives, reference documents) that prove compliance.

LEED Projects

Regardless of whether or not the project pursues formal LEED certification, the Green Building Standard Worksheet must be completed for the Schematic Design and Design Development phases. For those credits that will be achieved through the LEED process, note in the Construction Documents and Construction Phase phases: "SEE LEED DOCUMENTATION".



Document Title: Project Description Form
Version Date: 03/31/11

Submission Date	
DFW Project Identification #	
Project Name	
Project Track (Infrastructure/Interior/Minor Renovation/Major Renovation/New Facility)	
Is the project pursuing formal LEED certification (date registered)?	
Submission Milestone (SD, DD, CD, Construction Phase)	
Dates of Previous Submissions	
Sustainability Liaison (Submission Completed by)	
Submission Verified by (Name and role on Project)	
Lead Architect/Engineer	
Commissioning Agent	
Energy Modeler	
Contractor	
Estimated construction cost and completion date	
Brief Project Scope and Description	
Identify any Significant Changes since the last submission that affect the sustainability of the project	
Project Area (sqft)	
Building Area (sqft)	
Pervious Area (sqft)	
Impervious Area (sqft) (Note parking area if applicable)	
Occupancy (Male & Female breakdown)	

Document Title: Green Building Standards

Document Title: Green Building Standard Worksheet		Submission Milestone (SD, DD, CD, Construction Phase)		Sustainability Liaison (Submission Completed by)		Submission Verified by (Name and role on Project)		Dates of Previous Submissions	
Submission Date	DFW Project Identification #	Project Name	Project Track (Infrastructure/Interior/Minor Renovation/Major Renovation/New Facility)	GBS Checklist Track Required/Optional	Equiv. LEED 2009 Pts	IDENTIFY SUSTAINABLE DESIGN OPPORTUNITIES (update checklist with later submissions to correlate with compliance)	IMPLEMENT OPPORTUNITIES (if the design team cannot implement a required credit, an explanation must be provided).	PROVIDE NARRATIVE DRAWING OR SPECIFICATION REFERENCE	VERIFY SUSTAINABLE CONSTRUCTION (Narrative tracking monitoring and compliance)
Credit		Infrastructure	Interior/Minor Renovation	Major Renovation	New Facility	Yes	No	n/a	
DFW Baseline Credits									
DFW 1	Green Meetings	R	R	R	R	n/a			
DFW 2	Sustainability Liaison	R	R	R	R	n/a			
DFW 3	Integrated Design	R	R	R	R	n/a			
DFW 4	Water Management Plan	R	R	R	R	n/a			
DFW 5	Energy Management Plan	R	R	R	R	n/a			
DFW 6	Material Durability	R	R	R	R	n/a			
DFW 7	Acoustics and Noise	R	R	R	R	n/a			
DFW 8	Sustainable Construction Practices	R	R	R	R	n/a			
DFW Requirements based on LEED 2009									
Sustainable Sites									
Prereq 1	Construction Activity Pollution Prevention	R	R	R	R	Prereq			
Credit 1	Site Selection	O	O	O	O	1			
Credit 2	Development Density and Community Connectivity	O	O	O	O	5			
Credit 3	Brownfield Redevelopment (Regional Credit)	O	O	O	O	1			
Credit 4.1	Alternative Transportation-Public Transportation Access	O	O	O	O	6			
Credit 4.2	Alternative Transportation-Bicycle Storage and Changing Rooms	O	O	O	O	1			
Credit 4.3	Alternative Transportation-Low-Emitting and Fuel-Efficient Vehicles	O	O	O	O	3			
Credit 4.4	Alternative Transportation-Parking Capacity	O	O	O	O	2			
Credit 5.1	Site Development-Protect or Restore Habitat (Regional Credit)	R	O	O	R	1			
Credit 5.2	Site Development-Maximize Open Space	O	O	O	O	1			
Credit 6.1	Stormwater Design-Quantity Control (Regional Credit)	R	O	R	R	1			
Credit 6.2	Stormwater Design-Quality Control (Regional Credit)	R	O	R	R	1			
Credit 7.1	Heat Island Effect-Non-Roof	R	O	R	R	1			
Credit 7.2	Heat Island Effect-Roof	O	R	R	R	1			
Credit 8	Light Pollution Reduction	R	R	R	R	1			

Revision: 001
Document Number: FRM-002

Document Title: Green Building Standard Worksheet													
Version Date: 03/31/11													
Credit	GBS Checklist Track Required/Optional				SCHEMATIC DESIGN			DESIGN DEVELOPMENT		CONSTRUCTION DOCUMENTS	CONSTRUCTION PHASE		
	Infrastructure	Interior Minor Renovation	Major Renovation	New Facility	Equip. LEED 2009 Pts	IDENTIFY SUSTAINABLE DESIGN OPPORTUNITIES (update checklist with later submissions to correlate with compliance)	IMPLEMENT OPPORTUNITIES (if the design team cannot implement a required credit, an explanation must be provided).	PROVIDE NARRATIVE, DRAWING OR SPECIFICATION REFERENCE	VERIFY SUSTAINABLE CONSTRUCTION (Narrative, tracking, monitoring, and compliance)	Yes	Maybe	No	n/a
Water Efficiency													
Prereq 1	Water Use Reduction-20% Reduction	O	R	R	R	Prereq							
Credit 1- 1- 2	Water Efficient Landscaping (Reduce by 50%, At least 50% No Potable Water Use or Irrigation)	R At least 50%	O	R At least 50%	R At least 50%	2 to 4							
Credit 2	Innovative Wastewater Technologies	O	O	O	O	2							
Credit 3- 1- 3- 3	Water Use Reduction - Reduce by 30%, 35%, 40%	O	O	R At least 30%	R At least 40%	2 to 4							
Energy and Atmosphere													
Prereq 1	Fundamental Commissioning of Building Energy Systems	O	R	R	R	Prereq							
Prereq 2	Minimum Energy Performance	R	R	R	R	Prereq							
Prereq 3	Fundamental Refrigerant Management	O	R	R	R	Prereq							
Credit 1-1- 1-19	Optimize Energy Performance	O	O	R At least 10%	R At least 20%	1 to 19							
Credit 2-1-2-7	On-Site Renewable Energy (1%, 3%, 5%, 7%, 9%, 11%, 13%) (Regional Credit)	O	O	O	R At least 1%	1 to 7							
Credit 3	Enhanced Commissioning	O	O	R	R	2							
Credit 4	Enhanced Refrigerant Management	O	O	O	O	2							
Credit 5	Measurement and Verification	O	O	R	R	3							
Credit 6	Green Power	O	O	O	O	2							
Materials and Resources													
Prereq 1	Storage and Collection of Recyclables	O	R	R	R	Prereq							
Credit 1-1-1-3	Building Reuse-Maintain Existing Walls, Floors, and Roof (Reuse 55%, 75%, 95%)	O	O	R At least 55%	O At least 55%	1 to 3							

Revision: 001
Document Number: FRM-032

Document Title: Green Building Standards

Document Title: Green Building Standard Worksheet
Version Date: 03/31/11



Credit	GBS Checklist Track Required/Optional				SCHEMATIC DESIGN		DESIGN DEVELOPMENT	CONSTRUCTION DOCUMENTS	CONSTRUCTION PHASE
	Infrastructure	Interior Minor Renovation	Major Renovation	New Facility	IDENTIFY SUSTAINABLE DESIGN OPPORTUNITIES (update checklist with later submissions to correlate with compliance)	IMPLEMENT OPPORTUNITIES (if the design team cannot implement a required credit, an explanation must be provided).			
Credit 1.4	Building Reuse-Maintain 50% of Interior Non-Structural Elements	O	O	R	R				
Credit 2.1-2.2	Construction/Waste Management (50%, 75% Recycled or Salvaged) (Regional Credit)	R	At least 75%	R	At least 75%				
Credit 3.1-3.2	Materials Reuse (Reuse 5%, 10%)	O	O	R	R				
Credit 4.1-4.2	Recycled Content (10%, 20% of Content)	R	At least 20%	R	At least 20%				
Credit 5.1-5.2	Regional Materials: 10-20% of materials (10% 20% of Materials)	R	At least 20%	R	At least 20%				
Credit 6	Rapidly Renewable Materials	O	O	O	O				
Credit 7	Certified Wood	O	R	R	R				
Indoor Environmental Quality									
Prereq 1	Minimum Indoor Air Quality Performance Environmental Tobacco Smoke (ETS) Control	O	R	R	R				Prereq
Prereq 2	Outdoor Air Delivery Monitoring	O	R	R	R				Prereq
Credit 1	Increase Ventilation	O	O	O	O				1
Credit 3.1	Construction IAQ Management Plan-During Construction IAQ Management Before Occupancy	R	R	R	R				1
Credit 3.2	Low-Emitting Materials-Adhesives and Sealants	O	R	R	R				1
Credit 4.2	Low-Emitting Materials-Paints and Coatings	O	R	R	R				1
Credit 4.3	Low-Emitting Materials-Flooring/Systems	O	R	R	R				1
Credit 4.4	Low-Emitting Materials-Composite Wood and Adhesive Products	O	R	R	R				1
Credit 5	Indoor Chemical/Pollutant Source Control	O	O	R	R				1
Credit 6.1	Controllability of Systems-Lighting	O	R	R	R				1
Credit 6.2	Controllability of Systems-Thermal Comfort	O	R	R	R				1
Credit 7.1	Thermal Comfort-Design	O	O	R	R				1
Credit 7.2	Thermal Comfort-Verification	O	O	R	R				1
Credit 8.1	Daylight and Views-Daylight	O	O	O	R				1
Credit 8.2	Daylight and Views-Views	O	O	O	R				1

Revision: 001
Document Number: FRM-032



Document Title: Green Building Standards

Document Title: Green Building Standard Worksheet
Version Date: 03/31/11



Credit	GBS Checklist Track Required/Optional					SCHEMATIC DESIGN			DESIGN DEVELOPMENT	CONSTRUCTION DOCUMENTS	CONSTRUCTION PHASE	VERIFY SUSTAINABLE CONSTRUCTION (Narrative, tracking, monitoring and compliance)
	Infrastructure	Interior Minor Renovation	Major Renovation	New Facility	Equiv. LEED 2009 Pts	IDENTIFY SUSTAINABLE DESIGN OPPORTUNITIES (update checklist with later submissions to correlate with compliance)	Yes	Maybe				
Innovation and Design Process												
Credit 1.1-1.5	0	0	0	0	1							
Credit 2	0	0	R	R	1							
Total Credits						0	0	0	0			

ADDITIONAL NOTES

Revision: 001
Document Number: FRM-032