Memorandum

Date: October 13, 2006

To: Board of Supervisors

From: Robert Nisbet, Director of General Services

Subject: Green Building Standard Board Letter - Explanation of Attachments

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There are several attachments to this board letter that are included in order to provide the Board and public additional information and detail related to sustainable architectural design. They are not mandatory reading for the Board to fully understand this presentation and the recommendations contained herein. **The two-page board letter provides an adequate executive summary along with the presentation, which includes a PowerPoint submittal.**

Attachments:

1. **Staff Report** – This document is a policy paper that presents in more detail the argument for the county to consider a minimum standard for public buildings.
2. A discussion of using a "**life cycle costing**" methodology in order to support whether or not to incorporate green features in a building.
3. An **E-Newsletter** discussing the genesis of the "2030 Challenge". This concept and discussion was presented by Ed Mazria, in Santa Barbara at a community forum held September 26, 2006.
4. **Leed Cost Study** – Optimize Energy Performance.
5. County of Santa Barbara Public Works **building green material list**.
6. **GSA Leed Application Guide** (*Bound copy)* – This federal guide is proposed to serve as the basis for a county green building standard.

Office of the County Architect

Staff Report

To: Santa Barbara County Board of Supervisors

From: Robert Ooley, AIA County Architect

CC: Robert Nisbet, Director General Services

Date: October 12, 2006

Re: Sustainable Public Architecture Directive

That the Board direct staff to draft a Sustainable Public Architecture Directive for adoption by the Board that mandates the development of all county facilities to adhere to LEED/2030 criteria. Such a document would be crafted based upon a combination of the US Green Building Council's (Leadership in Energy and Environmental Design) LEED criteria, the 2030 Challenge and the Federal GSA-LEED guidelines. The resulting benefits to the County and community are both economic and environmental.

As discussed in detail in the Background section of this Agenda Letter, the increase in temperature globally can largely be attributed to the construction and operation of facilities world-wide. Using an energy budget modeling tool development by Energy☆ and the U.S. Department of Energy, a facility CO_2 emissions and energy budget can be calculated for analysis. Staff used the modeling tool to generate the following numbers.

The county owns and operates around 2 million square feet of facilities; of this amount the public uses just over 1.8 million square feet. The total annual source energy for this square footage is 242,690,254 (kBtu-CO_2 emissions) with a total annual site energy of 87,414,712 (kBtu-CO_2 emissions) with an annual energy budget of $2,765,829.

By mandating that the county implement LEED/2030, the potential decrease in facility CO_2 emissions would be approximately 121,345,127 pounds annually. This does not include the site emissions. The resulting 50% decrease (or savings) in the energy budget for this same square footage would be $1,382,914. These reductions are based upon the 2030 Challenge of reducing the consumption of fossil fuels by 50% now, increasing that reduction until there is a 100% carbon free emissions. Staff believes that the 50% requirement is possible given current alternative energy technology. Even the slightest reduction of 10% would result in an annual savings of $276,582 and a decrease in CO_2 emission of 24,269,025 pounds annually.

The county has provided great leadership in the residential/commercial recycling effort, carpooling and alternative transportation efforts, now it is time for us to provide community leadership in reducing the environmental footprint of the public facilities used to deliver services to our constituents.

Most of the features to help reduce this environmental footprint already existing, they cost little if anything to implement. There are many ways to reach the 50% target now. Reaching the future targets will require vigilance at all levels of government and is possible given the hugh benefits to the community. Not only can we provide this leadership, the community is expecting the county to be a leader and to show the way---we can, we must.

Staff recommends that ordinance 4452 (adopted by your Board on March 26, 2002) enabling the *Facility Policy Framework*, be amended to include mandated direction that all new or remodeled county buildings be developed in compliance to the Sustainable Public Architecture Directive.

It is important to address why the county should step-up its facility sustainability efforts. First, the public will be supportive of our efforts to increase the durability, efficiency and quality while reducing life-cycle costs of new and renovated facilities. Second, not implementing LEED/2030 will continue to contribute to the overall CO_2 emissions which in turn contribute to global warming. Third and finally, the inclusion of LEED/2030 requirements will improve the bottom line which is how the susbstainable features will be paid for over time.

Public Opinion Polling

The General Public support sustainable buildings. During the month of August 2002, the UCSB Department of Communications conducted a public opinion survey of 4,100 county residents on behalf of the Office of the County Architect (OCA). The survey asked the public a number of questions about county facility planning, maintenance and quality issues about county facilities. With respect to facility quality, energy efficiency and susbstainable design features the respondents overwhelming support the county in its efforts to construct facilities with these features. In particular, on the topic of providing "quality structures" the public ranked this 8.07 out of 10 in support. They favored paying more for these quality structures with a ranking of 6.67 out of 10. When asked about "green" and sustainable facilities, the public strongly supported this idea with a ranking of 8.57 out of 10. In an effort to determine the perception of quality by the public, the historic Santa Barbara Courthouse was used as an example. The public overwhelming agreed that the Courthouse was a quality, beautify building with a ranking of 9.11 out of 10 points. When asked if the county should be constructing new buildings of such quality, the public strongly supported the idea with a ranking of 7.48 points out of 10.

National Sustainable Standards

The **Leadership in Energy and Environmental Design** (LEED) Green Building Rating System™ is the nationally accepted benchmark for the design, construction, and operation of high performance green buildings. LEED gives building owners and operators the tools they need to have an immediate and measurable impact on their buildings' performance. LEED promotes a whole-building approach to sustainability by recognizing performance in five key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality.

The "**2030 °Challenge**" asks the global architecture and building community to adopt the following targets:

1. That all new buildings and developments be designed to use ½ the fossil fuel energy they would typically consume (½ the country average for that building type).
2. That at a minimum, an equal amount of existing building area (through design, purchase of renewable energy and/or the application of renewable technologies) be renovated annually to use ½ the amount of fossil fuel energy they are currently consuming.
3. That the fossil fuel reduction standard for all new buildings be increased to:
   60% in 2010
   70% in 2015
   80% in 2020
   90% in 2025
   Carbon-neutral by 2030 (using no fossil fuel GHG emitting energy to operate).

The **Federal GSA-LEED Guidelines** have been modified by the GSA from the published LEEDs criteria to mandate no-cost features in all federal buildings, evaluate and include low-cost features and to consider medium/high-cost features if the benefits to the staff and public out-weight the cost to include those features.

County's Early Efforts

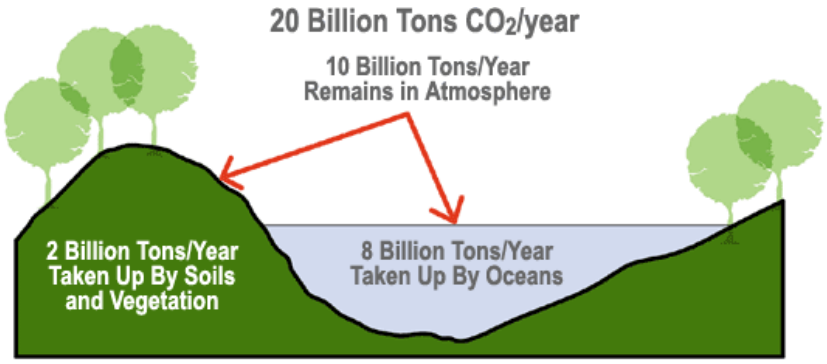
On December 11, 2001, your board adopted the Facilities Policy Framework and directed staff to base facility development upon that framework. The Framework contains eight overarching objectives with 47 supporting policy statements that communicate the agency's desire to build sustainable facilities. Since the adoption of the Framework, six projects have been completed using the sustainable objectives outlined within the Framework: Casa Nueva, Lompoc Wellness Clinic, District Attorney Office, Hall of Records, Public Works Service Center and Children's Service Center. Of these projects, two of them have received recognition for their use of renewable energy use, use of recycled materials, preservation of existing materials, and integration into the site and reduced energy consumption. The Framework only encourages the inclusion of sustainable features. In order for the county to reduce its environmental footprint these features must be mandated. Staff is proposing to draft a Sustainable Public Architecture Directive with input from facility stakeholders and return to the Board for adoption which would include direction to mandate the implementation of the Directive.

Of the eight California counties used as benchmarks, few have written sustainable policies, most have some level of voluntary compliance with LEEDs, at least one county clearly discourages the inclusion of sustainable features in its capital improvement program. The only California County that has a written directive is Alameda. Alameda County has enacted an ordinance mandating the inclusion of sustainable features in the form of LEED certification levels with Silver as the minimum target.

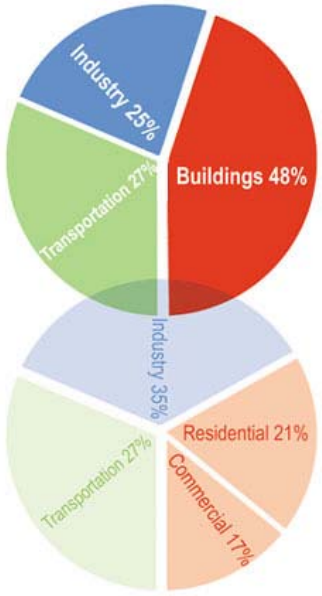
CO_2 Emissions and Global Warming

The County has a current building inventory of just over 500 individual structures, ranging from storage sheds to jails and everything in-between. The general public uses about 180 of these

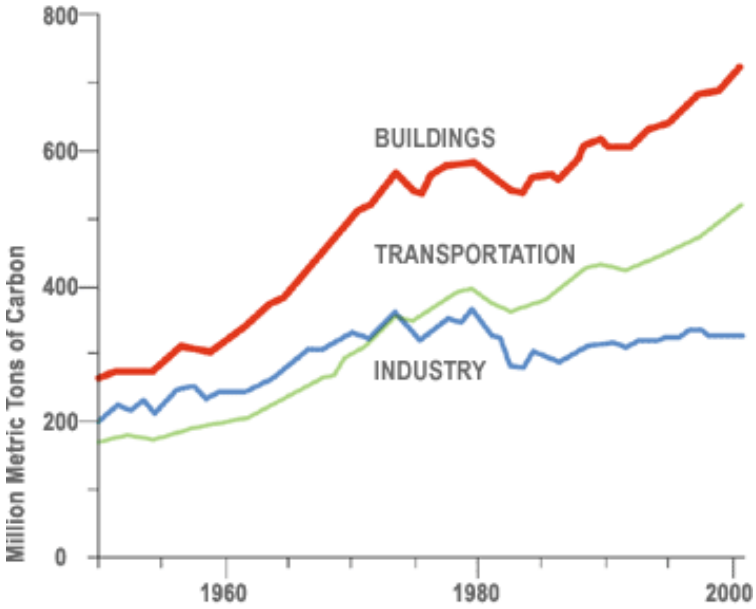
structures on a regular basis. These facilities use a tremendous amount of natural, non-renewable resources to operate resulting in the emissions continued and increasing emission of carbon into the air we breathe. Combined with other sources of emissions, the air quality in the community continues to decline and the regional relative temperature continues to rise. We are fortunate in Santa Barbara County to live adjacent to the Pacific Ocean, because any rise in temperature is often off-set by the amount that the ocean absorbs, in-turn generating coastal and valley fog to mitigate the high temperatures. In addition, the ocean absorbs a portion of the $C0_2$ generated by global emissions from all sources. The earth itself absorbs 2 billion tons.



The average American generates 22 tons of carbon dioxide ($C0_2$, *a green house gas*) in a single year, which is six times that of the global average. For the residents of Santa Barbara County resulting in 9 million tons of $C0_2$ annually being released into the atmosphere. Of the sources (*U.S. Energy Information Administration, 2003*) for $C0_2$, 27% is generated by the transportation sector, 25% by industrial operations and 48% by facility operations. These percentages change if we shift the emissions from transportation and industry that contribute to the construction and operation of buildings into the building sector; resulting in emissions of 1% transportation, 23% industry and 76% for buildings. Industry continues to improve as a result of government regulations to improve air and water quality in our communities. Transportation also continues to improve as a result of similar regulations. The building section however has not experienced the same and that is because of the lack of mandated regulations to improve. Other than building code standards for general public safety, there are no mandated requirements that building emissions be reduced. There is substantial material in the scientific community that links the emission of $C0_2$ to the rise of temperature globally. Given the fact that the construction and operation of buildings contribute at least 48% and as much as 76% of all emissions into the atmosphere; reducing these emission will do more to lowing global warming, than the other two sectors combined. The construction and operations of facilities is a locally controlled activity, not a state, national or global activity. That said it takes all of us collectively to make a difference.



Sectors Generating CO_2 Emissions



Re-aligned Sectors Generating CO_2 Emissions

The charts above indicate those sectors tracked by the U.S Department of Energy as contributors to CO2 emissions. The Industry and Transportation sectors are regulated; the Building sector is not currently regulated for CO_2 emissions.

The 180 owned and occupied structures by the County equal 1.8 million square feet. The energy budget for the1.8 million square foot inventories (*as calculated by Energy☆ based upon data from the U.S. Department of Energy*) is $2,765,829 annually. Decreasing the consumption of energy by just 10% on this inventory would result in a $276,583 dollar savings.

Sustainable Public Architecture Directive

The Sustainable Public Architecture Directive will be drafted using three published references, LEED, the 2030 Challenge and the GSA-LEED Applications Guide. The GSA-LEED Guide is also similar to the approach that Alameda County has implemented. Basically, these two agencies have taken the core of LEED and modified the criteria/credits to a sliding scale of applicability. The scale is based upon the size of the project, in other words, if the proposed project is a minor interior remodel, then the more costly LEED features are not implemented. All new facilities include green features and those projects over $500,000 begin to implement additional green features.

The Sustainable Public Architecture Directive will be proposed as an amendment to Chapter 12A, Article IV of the Santa Barbara County Code to include implementation of susbstainable features in all new county facilities and renovations of existing county facilities. The Directive will also apply to space that the county leases where tenant improvements are proposed.

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Rating System

Version 2.0

Including the Project Checklist

June 2001

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Project Checklist

Sustainable Sites

14 Possible Points

Y			Prereq 1	**Erosion & Sedimentation Control**	Required
Y	?	N	Credit 1	**Site Selection**	1
Y	?	N	Credit 2	**Urban Redevelopment**	1
Y	?	N	Credit 3	**Brownfield Redevelopment**	1
Y	?	N	Credit 4.1	**Alternative Transportation**, Public Transportation Access	1
Y	?	N	Credit 4.2	**Alternative Transportation**, Bicycle Storage & Changing Rooms	1
Y	?	N	Credit 4.3	**Alternative Transportation**, Alternative Fuel Refueling Stations	1
Y	?	N	Credit 4.4	**Alternative Transportation**, Parking Capacity	1
Y	?	N	Credit 5.1	**Reduced Site Disturbance**, Protect or Restore Open Space	1
Y	?	N	Credit 5.2	**Reduced Site Disturbance**, Development Footprint	1
Y	?	N	Credit 6.1	**Stormwater Management**, Rate or Quantity	1
Y	?	N	Credit 6.2	**Stormwater Management**, Treatment	1
Y	?	N	Credit 7.1	**Landscape & Exterior Design to Reduce Heat Islands**, NonRoof	1
Y	?	N	Credit 7.2	**Landscape & Exterior Design to Reduce Heat Islands**, Roof	1
Y	?	N	Credit 8	**Light Pollution Reduction**	1

Water Efficiency

5 Possible Points

Y	?	N	Credit 1.1	**Water Efficient Landscaping**, Reduce by 50%	1
Y	?	N	Credit 1.2	**Water Efficient Landscaping**, No Potable Use or No Irrigation	1
Y	?	N	Credit 2	**Innovative Wastewater Technologies**	1
Y	?	N	Credit 3.1	**Water Use Reduction**, 20% Reduction	1
Y	?	N	Credit 3.2	**Water Use Reduction**, 30% Reduction	1

Energy & Atmosphere

17 Possible Points

Y			Prereq 1	**Fundamental Building Systems Commissioning**	Required
Y			Prereq 2	**Minimum Energy Performance**	Required
Y			Prereq 3	**CFC Reduction in HVAC&R Equipment**	Required
Y	?	N	Credit 1.1	**Optimize Energy Performance**, 20% New / 10% Existing	2
Y	?	N	Credit 1.2	**Optimize Energy Performance**, 30% New / 20% Existing	2
Y	?	N	Credit 1.3	**Optimize Energy Performance**, 40% New / 30% Existing	2
Y	?	N	Credit 1.4	**Optimize Energy Performance**, 50% New / 40% Existing	2
Y	?	N	Credit 1.5	**Optimize Energy Performance**, 60% New / 50% Existing	2
Y	?	N	Credit 2.1	**Renewable Energy**, 5%	1
Y	?	N	Credit 2.2	**Renewable Energy**, 10%	1
Y	?	N	Credit 2.3	**Renewable Energy**, 20%	1
Y	?	N	Credit 3	**Additional Commissioning**	1
Y	?	N	Credit 4	**Ozone Depletion**	1
Y	?	N	Credit 5	**Measurement & Verification**	1
Y	?	N	Credit 6	**Green Power**	1

Materials & Resources

13 Possible Points

Y			Prereq 1	**Storage & Collection of Recyclables**	Required
Y	?	N	Credit 1.1	**Building Reuse**, Maintain 75% of Existing Shell	1
Y	?	N	Credit 1.2	**Building Reuse**, Maintain 100% of Shell	1
Y	?	N	Credit 1.3	**Building Reuse**, Maintain 100% Shell & 50% Non-Shell	1
Y	?	N	Credit 2.1	**Construction Waste Management**, Divert 50%	1
Y	?	N	Credit 2.2	**Construction Waste Management**, Divert 75%	1
Y	?	N	Credit 3.1	**Resource Reuse**, Specify 5%	1
Y	?	N	Credit 3.2	**Resource Reuse**, Specify 10%	1
Y	?	N	Credit 4.1	**Recycled Content**, Specify 25%	1
Y	?	N	Credit 4.2	**Recycled Content**, Specify 50%	1
Y	?	N	Credit 5.1	**Local/Regional Materials**, 20% Manufactured Locally	1
Y	?	N	Credit 5.2	**Local/Regional Materials**, of 20% Above, 50% Harvested Locally	1
Y	?	N	Credit 6	**Rapidly Renewable Materials**	1
Y	?	N	Credit 7	**Certified Wood**	1

Indoor Environmental Quality

15 Possible Points

Y			Prereq 1	**Minimum IAQ Performance**	Required
Y			Prereq 2	**Environmental Tobacco Smoke** (ETS) **Control**	Required
Y	?	N	Credit 1	**Carbon Dioxide** (CO_2) **Monitoring**	1
Y	?	N	Credit 2	**Increase Ventilation Effectiveness**	1
Y	?	N	Credit 3.1	**Construction IAQ Management Plan**, During Construction	1
Y	?	N	Credit 3.2	**Construction IAQ Management Plan**, Before Occupancy	1
Y	?	N	Credit 4.1	**Low-Emitting Materials**, Adhesives & Sealants	1
Y	?	N	Credit 4.2	**Low-Emitting Materials**, Paints	1
Y	?	N	Credit 4.3	**Low-Emitting Materials**, Carpet	1
Y	?	N	Credit 4.4	**Low-Emitting Materials**, Composite Wood	1
Y	?	N	Credit 5	**Indoor Chemical & Pollutant Source Control**	1
Y	?	N	Credit 6.1	**Controllability of Systems**, Perimeter	1
Y	?	N	Credit 6.2	**Controllability of Systems**, Non-Perimeter	1
Y	?	N	Credit 7.1	**Thermal Comfort**, Comply with ASHRAE 55-1992	1
Y	?	N	Credit 7.2	**Thermal Comfort**, Permanent Monitoring System	1
Y	?	N	Credit 8.1	**Daylight & Views**, Daylight 75% of Spaces	1
Y	?	N	Credit 8.2	**Daylight & Views**, Views for 90% of Spaces	1

Innovation & Design Process

5 Possible Points

Y	?	N	Credit 1.1	**Innovation in Design**: Specific Title	1
Y	?	N	Credit 1.2	**Innovation in Design**: Specific Title	1
Y	?	N	Credit 1.3	**Innovation in Design**: Specific Title	1
Y	?	N	Credit 1.4	**Innovation in Design**: Specific Title	1
Y	?	N	Credit 2	**LEED™ Accredited Professional**	1

Project Totals

69 Possible Points

☐ ☐ ☐ **Certified** 26-32 points **Silver** 33-38 points **Gold** 39-51 points **Platinum** 52-69 points

Sustainable Sites

SS | WE | EA | MR | EQ | ID
Prerequisite 1

Prerequisite 1 **Erosion & Sedimentation Control** Required

Intent

Control erosion to reduce negative impacts on water and air quality.

Requirement

Prerequisite 1.0 Design to a site sediment and erosion control plan that conforms to best management practices in the EPA's Storm Water Management for Construction Activities, EPA Document No. EPA-832-R-92-005, Chapter 3, OR local Erosion and Sedimentation Control standards and codes, whichever is more stringent. The plan shall meet the following objectives:

- Prevent loss of soil during construction by storm water runoff and/or wind erosion, including protecting topsoil by stockpiling for reuse.

- Prevent sedimentation of storm sewer or receiving streams and/or air pollution with dust and particulate matter.

Technologies & Strategies

Adopt an erosion and sedimentation control plan for the project site during construction. Consider employing strategies such as temporary and permanent seeding, mulching, earth dikes, silt fencing, sediment traps, and sediment basins.

1 Point

Credit 1 **Site Selection**

Intent

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

Requirement

Credit 1.0 (1 point) Do not develop buildings on portions of sites that meet any one of the following criteria:

-Prime farmland as defined by the American Farmland Trust

-Land whose elevation is lower than **5 feet above** the elevation of the 100-year flood as defined by FEMA

-Land which provides habitat for any species on the Federal or State threatened or endangered list

-Within **100 feet** of any wetland as defined by 40 CFR, Parts 230-233 and Part 22, OR as defined by local or state rule or law, whichever is more stringent

-Land which prior to acquisition for the project was public parkland, unless land of equal or greater value as parkland is accepted in trade by the public landowner (Park Authority projects are exempt)

Technologies & Strategies

During the site selection process, give preference to those sites that do not include sensitive site elements and restricted land types. Select a suitable building location and design the building with the minimal footprint to minimize site disruption. Strategies include stacking the building program, tuck under parking, and sharing facilities with neighbors.

Credit 2 **Urban Redevelopment** 1 Point

Intent

Channel development to urban areas with existing infrastructures, protecting greenfields and preserving habitat and natural resources.

Requirement

Credit 2.0 (1 point) Increase localized density to conform to existing or desired density goals by utilizing sites that are located within an existing minimum development density of **60,000 square feet per acre** (2 story downtown development)

Technologies & Strategies

During the site selection process, give preference to urban sites with high development densities. Quantify the development density of the project as well as the surrounding area.

1 Point

Credit 3 **Brownfield Redevelopment**

Intent

Rehabilitate damaged sites where development is complicated by real or perceived environmental contamination, reducing pressure on undeveloped land.

Requirement

Credit 3.0 (1 Point) Develop on a site classified as a Brownfield and provide remediation as required by EPA's Sustainable Redevelopment of Brownfields Program requirements

Technologies & Strategies

During the site selection process, give preference to brownfield sites. Identify tax incentives and property cost savings by selecting a brownfield site. Adopt a site remediation plan and cleanup the site using remediation strategies such as pump-and-treat, bioreactors, land farming, and in-situ remediation.

Credit 4 **Alternative Transportation** 1-4 Points

Intent

Reduce pollution and land development impacts from automobile use.

Requirements

Credit 4.1 (1 point) Locate building within **½ mile** of a commuter rail, light rail or subway station or **¼ mile** of 2 or more bus lines

Credit 4.2 (1 point) Provide suitable means for securing bicycles, with convenient changing/shower facilities for use by cyclists, for **5%** or more of building occupants

Credit 4.3 (1 point) Install alternative-fuel refueling station(s) for **3%** of the total vehicle parking capacity of the site. Liquid or gaseous fueling facilities must be separately ventilated or located outdoors

Credit 4.4 (1 point) Size parking capacity not to exceed minimum local zoning requirements AND provide preferred parking for carpools or van pools capable of serving **5%** of the building occupants, OR, add no new parking for rehabilitation projects AND provide preferred parking for carpools or van pools capable of serving **5%** of the building occupants.

Technologies & Strategies

Perform a transportation survey of future building occupants to identify transportation needs. Site the building near mass transit and design the building with transportation amenities such as bicycle racks and showering/changing facilities, alternative fuel refueling stations, and carpool/ van pool programs. Also consider sharing transportation facilities such as parking lots and refueling stations with neighbors.

1-2 Points

Credit 5 **Reduced Site Disturbance**

Intent

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

Requirements

Credit 5.1 (1 point) On greenfield sites, limit site disturbance including earthwork and clearing of vegetation to **40 feet** beyond the building perimeter, **5 feet** beyond primary roadway curbs, walkways, and main utility branch trenches, and **25 feet** beyond pervious paving areas that require additional staging areas in order to limit compaction in the paved area; OR, on previously developed sites, restore a minimum of **50%** of the remaining open area by planting native or adapted vegetation.

Credit 5.2 (1 point) Reduce the development footprint (including building, access roads and parking) to exceed the local zoning's open space requirement for the site by **25%**.

Technologies & Strategies

Perform a site survey to identify site elements and adopt a master plan for development of the project site. Select a suitable building location and design the building with the minimal footprint to minimize site disruption. Strategies include stacking the building program, tuck under parking, and sharing facilities with neighbors. Establish clearly marked construction boundaries to minimize disturbance of existing site and restore previously degraded areas to their natural state.

Credit 6 **Stormwater Management** 1-2 Points

Intent

Limit disruption of natural water flows by minimizing stormwater runoff, increasing on-site infiltration and reducing contaminants.

Requirements

Implement a stormwater management plan that results in:

Credit 6.1 (1 point) **No net increase** in the rate and quantity of stormwater runoff from existing to developed conditions; OR, if existing imperviousness is greater than **50%**, implement a stormwater management plan that results in a **25%** decrease in the rate and quantity of stormwater runoff.

Credit 6.2 (1 point) Treatment systems designed to remove **80%** of the average annual post development total suspended solids (TSS), and **40%** of the average annual post development total phosphorous (TP), by implementing Best Management Practices (BMPs) outlined in EPA's Guidance Specifying Management Measures for Sources of Non-point Pollution in Coastal Waters (EPA 840-B-92-002 1/93).

Technologies & Strategies

Design the project site to maintain natural stormwater flows by promoting infiltration. Specify garden roofs and pervious paving to minimize impervious surfaces. Reuse stormwater volumes generated for non-potable uses such as landscape irrigation, toilet and urinal flushing, and custodial uses. Install mechanical or natural treatment systems such as constructed wetlands, vegetated filter strips, and bioswales to treat stormwater volumes leaving the site.

1-2 Points

Credit 7 **Landscape and Exterior Design to Reduce Heat Islands**

Intent

Reduce heat islands (thermal gradient differences between developed and undeveloped areas) to minimize impact on microclimate and human and wildlife habitat.

Requirements

Credit 7.1 (1 point) Provide shade (within 5 years) on at least **30%** of non-roof impervious surface on the site, including parking lots, walkways, plazas, etc., OR, use light-colored/high-albedo materials (reflectance of at least 0.3) for **30%** of the site's non-roof impervious surfaces, OR place a minimum of **50%** of parking space underground OR use open-grid pavement system (net impervious area of LESS than 50%) for a minimum of **50%** of the parking lot area.

Credit 7.2 (1 point) Use ENERGY STAR Roof-compliant, high-reflectance AND high emissivity roofing (initial reflectance of at least 0.65 and three-year-aged reflectance of **at least 0.5** when tested in accordance with ASTM E903 and emissivity of **at least 0.9** when tested in accordance with ASTM 408) for a minimum of **75%** of the roof surface; OR, install a "green" (vegetated) roof for at least **50%** of the roof area.

Technologies & Strategies

Shade constructed surfaces on the site with landscape features and minimize the overall building footprint. Consider replacing constructed surfaces (i.e., roof, roads, sidewalks, etc.) with vegetated surfaces such as garden roofs and open grid paving or specify light-colored, high-albedo materials to reduce the heat absorption.

Credit 8 **Light Pollution Reduction** 1 Point

Intent

Eliminate light trespass from the building site, improve night sky access, and reduce development impact on nocturnal environments.

Requirement

Credit 8.0 (1 point) Do not exceed Illuminating Engineering Society of North America (IESNA) footcandle level requirements as stated in the Recommended Practice Manual: Lighting for Exterior Environments, AND design interior and exterior lighting such that zero direct-beam illumination leaves the building site.

Technologies & Strategies

Adopt site lighting criteria to maintain safe light levels while avoiding off-site lighting and night sky pollution. Minimize site lighting where possible and model the site lighting using a computer model. Technologies to reduce light pollution include full cutoff luminaries, low-reflectance surfaces, and low-angle spotlights.

SS **WE** EA MR EQ ID

Credit 1

Water Efficiency

1-2 Points

Credit 1 **Water Efficient Landscaping**

Intent

Limit or eliminate the use of potable water for landscape irrigation.

Requirements

Credit 1.1 (1 point) Use high efficiency irrigation technology, OR, use captured rain or recycled site water, to reduce potable water consumption for irrigation by **50%** over conventional means.

Credit 1.2 (1 point) Use only captured rain or recycled site water for an additional **50%** reduction (**100% total reduction**) of potable water for site irrigation needs, OR, do not install permanent landscape irrigation systems.

Technologies & Strategies

Perform a soil/climate analysis to determine appropriate landscape types and design the landscape with indigenous plants to reduce or eliminate irrigation requirements. Use high efficiency irrigation systems and consider reuse of stormwater or graywater volumes for irrigation.

Credit 2 **Innovative Wastewater Technologies** 1 Point

Intent

Reduce the generation of wastewater and potable water demand, while increasing the local aquifer recharge.

Requirement

Credit 2.0 (1 point) Reduce the use of municipally provided potable water for building sewage conveyance by a minimum of **50%**, OR, treat **100%** of wastewater on site to tertiary standards.

Technologies & Strategies

Estimate the wastewater volumes generated in the building and specify high efficiency fixtures and dry fixtures such as composting toilets and waterless urinals to reduce these volumes. Consider reusing stormwater or graywater for sewage conveyance or on-site wastewater treatment systems (mechanical or natural).

1-2 Points

Credit 3 **Water Use Reduction**

Intent

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

Requirement & Submittals

Credit 3.1 (1 point) Employ strategies that in aggregate use **20%** less water than the water use baseline calculated for the building (not including irrigation) after meeting Energy Policy Act of 1992 fixture performance requirements.

Credit 3.2 (1 point) Exceed the potable water use reduction by an additional **10%** (**30%** total efficiency increase).

Technologies & Strategies

Estimate the potable and non-potable water needs for the building. Use high efficiency fixtures, dry fixtures such as composting toilets and waterless urinals, and occupant sensors to reduce the potable water demand. Consider reuse of stormwater and graywater for non-potable applications such as toilet and urinal flushing, mechanical systems, and custodial uses.

Energy & Atmosphere

SS | WE | **EA** | MR | EQ | ID

Prerequisite 1

Prerequisite 1 **Fundamental Building Systems Commissioning** Required

Intent

Verify and ensure that fundamental building elements and systems are designed, installed and calibrated to operate as intended.

Requirement

Prerequisite 1.0 Implement the following fundamental best practice commissioning procedures:

-Engage a commissioning authority

-Review design intent and basis of design documentation

-Include commissioning requirements in the construction documents

-Develop and utilize a commissioning plan

-Verify installation, functional performance, training and documentation

-Complete a commissioning report

Technologies & Strategies

Engage a commissioning authority and adopt a commissioning plan. Include commissioning requirements in bid documents and task the commissioning agent to produce a commissioning report once commissioning activities are completed.

Required

Prerequisite 2 **Minimum Energy Performance**

Intent

Establish the minimum level of energy efficiency for the base building and systems.

Requirement

Prerequisite 2.0 Design to meet building energy efficiency and performance as required by ASHRAE/IESNA 90.1-1999 or the local energy code, whichever is the more stringent.

Technologies & Strategies

Design the building envelope and building systems to maximize energy performance. Use a computer simulation model to assess the energy performance and identify the most cost effective energy efficiency measures. Quantify energy performance as compared to a baseline building.

Prerequisite 3 **CFC Reduction in HVAC&R Equipment** Required

Intent

Reduce ozone depletion.

Requirement

Prerequisite 3.0 **Zero use** of CFC-based refrigerants in new building HVAC&R base building systems. When reusing existing base building HVAC equipment, complete a comprehensive CFC phaseout conversion.

Technologies & Strategies

When reusing existing HVAC systems, conduct an inventory to identify equipment that uses CFC refrigerants and adopt a replacement schedule for these refrigerants. For new buildings, specify new HVAC equipment that uses no CFC refrigerants.

2-10 Points

Credit 1 **Optimize Energy Performance**

Intent

Achieve increasing levels of energy performance above the prerequisite standard to reduce environmental impacts associated with excessive energy use.

Requirements

Reduce design energy cost compared to the energy cost budget for regulated energy components described in the requirements of ASHRAE/IESNA Standard 90.1-1999, as demonstrated by a whole building simulation using the Energy Cost Budget Method described in Section 11:

New Buildings	Existing Buildings	Points
20%	**10%**	2
30%	**20%**	4
40%	**30%**	6
50%	**40%**	8
60%	**50%**	10

Regulated energy components include HVAC systems, building envelope, service hot water systems, lighting and other regulated systems as defined by ASHRAE.

Credit 1.1 (2 points) Reduce design energy cost by **20%** / **10%**.
Credit 1.2 (4 points) Reduce design energy cost by **30%** / **20%**.
Credit 1.3 (6 points) Reduce design energy cost by **40%** / **30%**.
Credit 1.4 (8 points) Reduce design energy cost by **50%** / **40%**.
Credit 1.5 (10 points) Reduce design energy cost by **60%** / **50%**.

Technologies & Strategies

Design the building envelope and building systems to maximize energy performance. Use a computer simulation model to assess the energy performance and identify the most cost effective energy efficiency measures. Quantify energy performance as compared to a baseline building.

Credit 2 **Renewable Energy** 1-3 Points

Intent

Encourage and recognize increasing levels of self-supply through renewable technologies to reduce environmental impacts associated with fossil fuel energy use.

Requirements

Supply a net fraction of the building's total energy use (as expressed as a fraction of annual energy cost) through the use of on-site renewable energy systems.

% Total Energy Load Cost in Renewables	Points
5%	1
10%	2
20%	3

Credit 2.1 (1 points) Renewable energy, **5%** contribution

Credit 2.2 (2 points) Renewable energy, **10%** contribution

Credit 2.3 (3 points) Renewable energy, **20%** contribution

Technologies & Strategies

Assess the project for renewable energy potential including solar, wind, geothermal, biomass, hydro, and bio-gas strategies. When applying these strategies, take advantage of net metering with the local utility.

1 Point

Credit 3 **Additional Commissioning**

Intent

Verify and ensure that the entire building is designed, constructed, and calibrated to operate as intended.

Requirement

Credit 3.0 (1 point) In addition to the Fundamental Building Commissioning prerequisite, implement the following additional commissioning tasks:

1. Conduct a focused review of the design prior to the construction documents phase.

2. Conduct a focused review of the Construction Documents when close to completion.

3. Conduct a selective review of contractor submittals of commissioned equipment. (The above three reviews must be performed by a firm other than the designer.)

4. Develop a recommissioning management manual.

5. Have a contract in place for a near-warranty end or post occupancy review.

Technologies & Strategies

Engage the Commissioning Authority early in project design phases. Task the commissioning agent to conduct project reviews before and after construction documents are complete. The Commissioning Agent must also create a recommissioning manual for the building and review the project at near-warranty end.

Credit 4 **Ozone Depletion** 1 Point

Intent

Reduce ozone depletion and support early compliance with the Montreal Protocol.

Requirement

Credit 4.0 (1 point) Install base building level HVAC and refrigeration equipment and fire suppression systems that do not contain HCFC's or Halon.

Technologies & Strategies

When reusing buildings, inventory existing building systems using refrigerants and fire suppression chemicals and replace those that contain HCFCs or halons. For new buildings, specify refrigeration and fire suppression systems that use no HCFCs or halons.

1 Point

Credit 5 **Measurement & Verification**

Intent

Provide for the ongoing accountability and optimization of building energy and water consumption performance over time.

Requirement

Credit 5.0 (1 point) Comply with the long term continuous measurement of performance as stated in Option B: Methods by Technology of the US DOE's International Performance Measurement and Verification Protocol (IPMVP) for the following:

-Lighting systems and controls

-Constant and variable motor loads

-Variable frequency drive (VFD) operation

-Chiller efficiency at variable loads (kW/ton)

-Cooling load

-Air and water economizer and heat recovery cycles

-Air distribution static pressures and ventilation air volumes

-Boiler efficiencies

-Building specific process energy efficiency systems and equipment

-Indoor water risers and outdoor irrigation systems

Technologies & Strategies

Model the energy and water systems to predict savings. Design the building with equipment to measure energy and water performance. Draft a Measurement & Verification Plan to apply during building operation that compares predicted savings to those actually achieved in the field.

Credit 6 **Green Power** 1 Point

Intent

Encourage the development and use of grid-source energy technologies on a net zero pollution basis.

Requirement

Credit 6.0 (1 point) Engage in a two year contract to purchase power generated from renewable sources that meet the Center for Resource Solutions (CRS) Green-e products certification requirements.

Technologies & Strategies

Estimate the energy needs of the building and investigate opportunities to engage in a green power contract with the local utility. Green power is derived from solar, wind, geothermal, biomass, or low-impact hydro sources.

Materials & Resources

Required

Prerequisite 1 **Storage & Collection of Recyclables**

Intent

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

Requirement

Prerequisite 1.0 Provide an easily accessible area that serves the entire building and is dedicated to the separation, collection and storage of materials for recycling including (at a minimum) paper, glass, plastics, and metals.

Technologies & Strategies

Designate an area for recyclable collection and storage that is appropriately sized and located in a convenient area. Identify local waste handlers and buyers for glass, plastic, office paper, newspaper, cardboard, and organic wastes. Instruct occupants on building recycling procedures. Consider employing cardboard balers, aluminum can crushers, recycling chutes, and other waste management technologies to further enhance the recycling program.

Credit 1 **Building Reuse** 1-3 Points

Intent

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

Requirements

Reuse large portions of existing structures during renovation or redevelopment projects:

Credit 1.1 (1 point) Maintain at least **75%** of existing building structure and shell (exterior skin and framing excluding window assemblies)

Credit 1.2 (1 point) Maintain an additional **25%** (**100%** total) of existing building structure and shell (exterior skin and framing excluding window assemblies)

Credit 1.3 (1 point) Maintain **100%** of existing building structure and shell AND **50%** non-shell (walls, floor coverings, and ceiling systems)

Technologies & Strategies

Consider reuse of existing buildings, including structure, shell, and non-shell elements. Remove elements that pose contamination risk to building occupants and upgrade outdated components such as windows, mechanical systems, and plumbing fixtures. Quantify the extent of building reuse.

1-2 Points

Credit 2 **Construction Waste Management**

Intent

Divert construction, demolition, and land clearing debris from landfill disposal. Redirect recyclable material back to the manufacturing process.

Requirements

Develop and implement a waste management plan, quantifying material diversion by weight. (Remember that salvage may include the donation of materials to charitable organizations such as Habitat for Humanity.)

Credit 2.1 (1 point) Recycle and/or salvage at least **50%** (by weight) of construction, demolition, and land clearing waste

Credit 2.2 (1 point) Recycle and/or salvage an additional **25%** (**75%** total by weight) of the construction, demolition, and land clearing debris

Technologies & Strategies

Establish goals for landfill diversion and adopt a construction waste management plan to achieve these goals. Consider recycling land clearing debris, cardboard, metals, brick, concrete, plastic, clean wood, glass, gypsum wallboard, carpet, and insulation. Designate a specific area on the construction site for recycling and track recycling efforts throughout the construction process. Identify construction haulers and recyclers to handle the designated materials.

Credit 3 **Resource Reuse** 1-2 Points

Intent

Extend the life cycle of targeted building materials by reducing environmental impacts related to materials manufacturing and transport.

Requirements

Credit 3.1 (1 point) Specify salvaged or refurbished materials for **5%** of building materials

Credit 3.2 (1 point) Specify salvaged or refurbished materials for **10%** of building materials

Technologies & Strategies

Identify opportunities to incorporate salvage materials into the building design and research potential material suppliers. Consider salvage materials such as beams and posts, flooring, paneling, doors and frames, cabinetry and furniture, brick, and decorative items.

1-2 Points

Credit 4 **Recycled Content**

Intent

Increase demand for building products that have incorporated recycled content materials, therefore reducing the impacts resulting from the extraction of new materials.

Requirements

Credit 4.1 (1 point) Specify a minimum of **25%** of building materials that contain in aggregate, a minimum weighted average of **20%** post-consumer recycled content material, OR, a minimum weighted average **40%** post-industrial recycled content material.

Credit 4.2 (1 point) Specify an additional **25%** (**50%** total) of building materials that contain in aggregate, a minimum weighted average of **20%** post-consumer recycled content material, OR, a minimum weighted average of **40%** post-industrial recycled content material.

Technologies & Strategies

Establish a project goal for recycled content materials and identify materials and material suppliers that can achieve this goal. During construction, ensure that the specified recycled content materials are installed and quantify the total percentage of recycled content materials installed.

Credit 5 **Local/Regional Materials** 1-2 Points

Intent

Increase demand for building products that are manufactured locally, thereby reducing the environmental impacts resulting from their transportation and supporting the local economy.

Requirements

Credit 5.1 (1 point) Specify a minimum of **20%** of building materials that are manufactured* regionally within a radius of 500 miles.

Credit 5.2 (1 point) Of these regionally manufactured materials, specify a minimum of **50%** that are extracted, harvested, or recovered within 500 miles.

* Manufacturing refers to the *final assembly* of components into the building product that is furnished and installed by the tradesmen. For example, if the hardware comes from Dallas, Texas, the lumber from Vancouver, British Columbia and the joist is assembled in Kent, Washington; then the location of the *final assembly* is Kent, Washington.

Technologies & Strategies

Establish a project goal for locally sourced materials and identify materials and material suppliers that can achieve this goal. During construction, ensure that the specified local materials are installed and quantify the total percentage of local materials installed.

1 Point

Credit 6 **Rapidly Renewable Materials**

Intent

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

Requirement

Credit 6.0 (1 point) Specify rapidly renewable building materials for **5%** of total building materials.

Technologies & Strategies

Establish a project goal for rapidly renewable materials and identify materials and suppliers that can achieve this goal. Consider materials such as bamboo flooring, wool carpet, strawboard, cotton batt insulation, linoleum flooring, poplar OSB, sunflower seed board, and wheatgrass cabinetry. During construction, ensure that the specified rapidly renewable materials are installed and quantify the total percentage of rapidly renewable materials installed.

Credit 7 **Certified Wood** 1 Point

Intent

Encourage environmentally responsible forest management.

Requirement

Credit 7.0 (1 point) Use a minimum of **50%** of wood-based materials certified in accordance with the Forest Stewardship Council Guidelines for wood building components including but not limited to structural framing and general dimensional framing, flooring, finishes, furnishings, and non-rented temporary construction applications such as bracing, concrete form work and pedestrian barriers.

Technologies & Strategies

Establish a project goal for FSC-certified wood products and identify products and suppliers that can achieve this goal. During construction, ensure that the FSC-certified wood products are installed and quantify the total percentage of FSC-certified wood products installed.

Indoor Environmental Quality

Required

Prerequisite 1 **Minimum IAQ Performance**

Intent

Establish minimum indoor air quality (IAQ) performance to prevent the development of indoor air quality problems in buildings, maintaining the health and well being of the occupants.

Requirement

Prerequisite 1.0 Meet the minimum requirements of voluntary consensus standard ASHRAE 62-1999, Ventilation for Acceptable Indoor Air Quality and approved Addenda.

Technologies & Strategies

Design the HVAC system to meet the ventilation requirements of the reference standard. Identify potential IAQ problems on the site and locate air intakes away from contaminant sources.

Prerequisite 2 **Environmental Tobacco Smoke** (ETS) **Control**

Required

Intent

Prevent exposure of building occupants and systems to Environmental Tobacco Smoke (ETS).

Requirement

Prerequisite 2.0

Zero exposure of nonsmokers to ETS by prohibition of smoking in the building, OR, provide a designated smoking room designed to effectively contain, capture and remove ETS from the building. At a minimum, the smoking room shall be directly exhausted to the outdoors with no recirculation of ETS-containing air to the nonsmoking area of the building, enclosed with impermeable structural deck-to-deck partitions and operated at a negative pressure compared with the surrounding spaces of **at least 7 Pa** (0.03 inches of water gauge).

Performance of smoking rooms shall be verified using tracer gas testing methods as described in the ASHRAE Standard 129-1997. Acceptable exposure in nonsmoking areas is defined as **less than 1%** of the tracer gas concentration in the smoking room detectable in the adjoining nonsmoking areas. Smoking room testing as described in the ASHRAE Standard 129-1997 is required in the contract documents and critical smoking facility systems testing results must be included in the building commissioning plan and report or as a separate document.

Technologies & Strategies

Prohibit smoking in the building or provide separate smoking rooms with isolated ventilation systems.

1 Point

Credit 1 **Carbon Dioxide** (CO_2) **Monitoring**

Intent

Provide capacity for indoor air quality (IAQ) monitoring to sustain long-term occupant health and comfort.

Requirement

Credit 1.0 (1 point) Install a permanent carbon dioxide (CO_2) monitoring system that provides feedback on space ventilation performance in a form that affords operational adjustments, AND specify initial operational set point parameters that maintain indoor carbon dioxide levels no higher than outdoor levels by more than 530 parts per million at any time.

Technologies & Strategies

Design the HVAC system with carbon dioxide monitoring sensors and integrate these sensors with the building automation system (BAS).

Credit 2 **Increase Ventilation Effectiveness** 1 Point

Intent

Provide for the effective delivery and mixing of fresh air to support the health, safety, and comfort of building occupants.

Requirement

Credit 2.0 (1 point) For mechanically ventilated buildings, design ventilation systems that result in an air change effectiveness (E) greater than or equal to **0.9** as determined by ASHRAE 129-1997. For naturally ventilated spaces demonstrate a distribution and laminar flow pattern that involves not less than **90%** of the room or zone area in the direction of air flow for at least **95%** of hours of occupancy.

Technologies & Strategies

Design the HVAC system and building envelope to optimize air change effectiveness. Air change effectiveness can be optimized using a variety of ventilation strategies including displacement ventilation, low-velocity ventilation, plug flow ventilation such as underfloor or near-floor delivery, and operable windows. Test the air change effectiveness of the building after construction.

1-2 Points

Credit 3 **Construction IAQ Management Plan**

Intent

Prevent indoor air quality problems resulting from the construction/renovation process, to sustain long-term installer and occupant health and comfort.

Requirements

Develop and implement an Indoor Air Quality (IAQ) Management Plan for the construction and preoccupancy phases of the building as follows:

Credit 3.1 (1 point) During construction meet or exceed the minimum requirements of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guideline for Occupied Buildings under Construction, 1995, AND protect stored on-site or installed absorptive materials from moisture damage, AND replace all filtration media immediately prior to occupancy. Filtration media shall have a Minimum Efficiency Reporting Value (MERV) of 13 as determined by ASHRAE 52.2-1999.

Credit 3.2 (1 point) Conduct a minimum two-week building flush-out with new filtration media at **100%** outside air after construction ends and prior to occupancy, OR conduct a baseline indoor air quality testing procedure consistent with current EPA Protocol for Environmental Requirements, Baseline IAQ and Materials, for the Research Triangle Park Campus, Section 01445.

Technologies & Strategies

Adopt an IAQ management plan to protect the HVAC system during construction, control pollutant sources, and interrupt pathways for contamination. Sequence installation of materials to avoid contamination of absorptive materials such as insulation, carpeting, ceiling tile, and gypsum wallboard. Prior to occupancy, perform a two-week building flushout or test the contaminant levels in the building.

Credit 4 **Low-Emitting Materials** 1-4 Points

Intent

Reduce the quantity of indoor air contaminants that are odorous or potentially irritating to provide installer and occupant health and comfort.

Requirements

Meet or exceed VOC limits for adhesives, sealants, paints, composite wood products, and carpet systems as follows:

Credit 4.1 (1 point) Adhesives must meet or exceed the VOC limits of South Coast Air Quality Management District Rule #1168 by, AND all sealants used as a filler must meet or exceed Bay Area Air Quality Management District Reg. 8, Rule 51.

Credit 4.2 (1 point) Paints and coatings must meet or exceed the VOC and chemical component limits of Green Seal requirements.

Credit 4.3 (1 point) Carpet systems must meet or exceed the Carpet and Rug Institute Green Label Indoor Air Quality Test Program.

Credit 4.4 (1 point) Composite wood and agrifiber products must contain no added urea-formaldehyde resins.

Technologies & Strategies

Specify low-VOC materials in construction documents. Ensure that VOC limits are clearly stated in each section where adhesives, sealants, paints, coatings, carpet systems, and composite woods are addressed.

1 Point

Credit 5 **Indoor Chemical & Pollutant Source Control**

Intent

Avoid exposure of building occupants to potentially hazardous chemicals that adversely impact air quality.

Requirement

Credit 5.0 (1 point) Design to minimize cross-contamination of regularly occupied occupancy areas by chemical pollutants: Employ permanent entry way systems (grills, grates, etc.) to capture dirt, particulates, etc. from entering the building at all high volume entry ways, AND provide areas with structural deck to deck partitions with separate outside exhausting, no air recirculation and negative pressure where chemical use occurs (including housekeeping areas and copying/print rooms), AND provide drains plumbed for appropriate disposal of liquid waste in spaces where water and chemical concentrate mixing occurs.

Technologies & Strategies

Design separate exhaust and plumbing systems for rooms with contaminants to achieve physical isolation from the rest of the building. Install permanent architectural entryway systems such as grills or grates to prevent occupant-borne contaminants from entering the building.

Credit 6 **Controllability of Systems** 1-2 Points

Intent

Provide a high level of individual occupant control of thermal, ventilation, and lighting systems to support optimum health, productivity, and comfort conditions.

Requirements

Credit 6.1 (1 point) Provide a minimum of **one** operable window and **one** lighting control zone **per 200 SF** for all occupied areas **within 15 feet** of the perimeter wall.

Credit 6.2 (1 point) Provide controls for each individual for airflow, temperature, and lighting for **50%** of the non-perimeter, regularly occupied areas.

Technologies & Strategies

Design the building with occupant controls for airflow, temperature, and lighting. Strategies to consider include task lighting, operable windows, and underfloor HVAC systems with individual diffusers.

1-2 Points

Credit 7 **Thermal Comfort**

Intent

Provide for a thermally comfortable environment that supports the productive and healthy performance of the building occupants.

Requirements

Credit 7.1 (1 point) Comply with ASHRAE Standard 55-1992, Addenda 1995 for thermal comfort standards including humidity control within established ranges per climate zone.

Credit 7.2 (1 point) Install a permanent temperature and humidity monitoring system configured to provide operators control over thermal comfort performance and effectiveness of humidification and/or dehumidification systems in the building.

Technologies & Strategies

Establish temperature and humidity comfort ranges and design the building envelope and HVAC system to maintain these comfort ranges. Install and maintain a temperature and humidity monitoring system in the building to automatically adjust building conditions as appropriate.

Credit 8 **Daylight & Views** 1-2 Points

Intent

Provide a connection between indoor spaces and outdoor environments through the introduction of sunlight and views into the occupied areas of the building.

Requirement & Submittals

Credit 8.1 (1 point) Achieve a minimum Daylight Factor of **2%** (excluding all direct sunlight penetration) in **75%** of all space occupied for critical visual tasks, not including copy rooms, storage areas, mechanical, laundry, and other low occupancy support areas. Exceptions include those spaces where tasks would be hindered by the use of daylight or where accomplishing the specific tasks within a space would be enhanced by the direct penetration of sunlight.

Credit 8.2 (1 point) Direct line of sight to vision glazing from **90%** of all regularly occupied spaces, not including copy rooms, storage areas, mechanical, laundry, and other low occupancy support areas.

Technologies & Strategies

Design the building to maximize daylighting and view opportunities. Strategies to consider include building orientation, shallow floor plates, increased building perimeter, exterior and interior shading devices, high performance glazing, and photo-integrated light sensors. Model daylighting strategies with a physical or computer model to assess footcandle levels and daylight factors achieved.

SS | WE | EA | MR | EQ | **ID**

Credit 1

Innovation & Design Process

1-4 Points

Credit 1 **Innovation in Design**

Intent

To provide design teams and projects the opportunity to be awarded points for exceptional performance above requirements set by the LEED Green Building Rating System™ and/or innovative performance in Green Building categories not specifically addressed by the LEED Green Building Rating System™.

Requirements

Credit 1.1 (1 point) In writing, using the LEED™ Credit Equivalence process, identify the **intent** of the proposed innovation credit, the proposed **requirement** for compliance, the proposed **submittals** to demonstrate compliance, and the **design approach** used to meet the required elements.

Credit 1.2 (1 point) Same as Credit 1.1.

Credit 1.3 (1 point) Same as Credit 1.1.

Credit 1.4 (1 point) Same as Credit 1.1.

Technologies & Strategies

Substantially exceed a LEED™ performance credit such as energy performance or water efficiency. Apply strategies or measures that are not covered by LEED™ such as acoustic performance, education of occupants, community development, or life-cycle analysis of material choices.

Credit 2 **LEED™ Accredited Professional** 1 Point

Intent

To support and encourage the design integration required by a LEED™ Green Building project and to streamline the application and certification process.

Requirement

Credit 2.0 (1 point) At least one principal participant of the project team that has successfully completed the LEED™ Accredited Professional exam.

Technologies & Strategies

Attend a LEED™ Accredited Professional Training Workshop and successfully pass the LEED™ accreditation exam.

GSA Public Buildings Service

GSA LEED® Applications Guide

February 2005

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Availability

Electronic versions of the *GSA LEED® Applications Guide* and the *GSA LEED® Cost Study* are available for downloading from the Whole Building Design Guide (WBDG) Web site at www.wbdg.org. The WBDG is the only knowledge-based Web portal designed to provide government and industry practitioners with one-stop access to up-to-date information on a wide range of federal construction criteria, guidance, and technology from an integrated, or "whole building," perspective. The WBDG contains an entire design objective branch with a number of resource pages and tools related to sustainability and the LEED® Green Building Rating System.

February 2005

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Appendix C: Summary of LEED Scorecards for Recent GSA Projects

- Summary of LEED Scorecards for Recent GSA Projects C-1

Introduction:

GSA LEED Applications Guide

Background & Purpose

The U.S. General Services Administration (GSA) is one of the largest building owners and managers in the nation, responsible for the construction, operation, and maintenance of various federal facilities, including courthouses, office buildings, land ports of entry, and research facilities. In response to federal government mandates (including Executive Order 13123—Greening the Government through Efficient Energy Management), and as a matter of agency policy, GSA actively promotes a value-driven building design process that emphasizes design excellence, user satisfaction, reduced operating costs, and environmental responsibility.

Through the *Facilities Standards for the Public Buildings Service* (document PBS–P100, 2003), GSA identifies Sustainability and Energy Performance as basic tenets of their General Design Philosophy. As a means of evaluating and measuring achievements in sustainable design, GSA uses the *Leadership in Energy and Environmental Design* (LEED®) Green Building Rating System of the U.S. Green Building Council. Since fiscal year 2000, GSA has mandated that all of its new construction and major modernization projects attain, at minimum, a LEED Certified rating, while striving for LEED Silver. Certain projects have even achieved a LEED Gold rating.

In support of GSA's commitment to the LEED program, this *GSA LEED Applications Guide* has been created to assist GSA Project Managers and their design teams in developing focused, value-driven, and cost-effective approaches to meeting GSA's LEED mandate. This *Applications Guide*, which is a companion document to the *GSA LEED Cost Study*, outlines an evaluation process in which the predicted first cost impacts of the individual LEED prerequisites and credits (developed from the *Cost Study*) are used as a basis for structuring an overall LEED project approach.

The process also illustrates how LEED criteria relate to existing GSA mandates, performance goals, and programmatic requirements.

While first cost will not be the sole basis for assessing LEED credits and developing a project's overall "green" goals, the process defined in the *Applications Guide* can assist project teams in separating the no-cost/low-cost "low-hanging fruit" from the moderate and high-cost measures that require more detailed design investigations and cost/benefit analyses. Overall, the *Applications Guide* is intended as a tool to assist project teams in planning and budgeting for LEED in the earliest stages of the design process. By engaging the LEED evaluation process early, project teams have the greatest opportunity to pursue integrated design solutions that can deliver life-cycle cost-effective, environmentally responsible, high-performance buildings.

Figure 1. Nathaniel R. Jones Federal Building and United States Courthouse, Youngstown, Ohio (LEED Certified Rating)
Architect: Robert A.M. Stern Architects

LEED Objectives in GSA Projects

GSA's LEED requirement can be seen as an extension of the agency's previous sustainability initiatives, and as part of GSA's overall efforts to continually improve building quality and performance. As such, it is important that design teams consider LEED as a means to achieve better, more sustainable buildings, rather than as an isolated goal in itself. Project teams should assume that the following goals and objectives apply to all GSA projects:

1) LEED measures should be selected to reinforce or support the programmatic, functional, and operational requirements of a project. These basic building requirements should not be compromised by LEED considerations.

2) Previously established GSA sustainability requirements (e.g., energy-efficiency targets, use of recycled-content materials) should be achieved and integrated with the corresponding LEED prerequisites or credits.

3) LEED credits that can be achieved with relative ease at a "no-cost" or "low-cost" level should typically be pursued, to the extent that such measures provide meaningful benefits to the building occupants and operators, the GSA, the community, or the environment. Meaningful benefits may include (but are not limited to) the following:

    - Reduced operational utility costs (energy, water, sewer)
    - Reduced operational maintenance costs
    - Increased useful life of building systems or equipment
    - Increased property value
    - Increased user satisfaction (potentially resulting in increased productivity, reduced absenteeism)
    - Community improvement
    - Support of local industry/economy
    - Reduced global environmental impacts
    - Enhanced agency profile
    - Accelerated market transformation for "green" products and practices

    Appropriate strategies and benefits will typically require review on a project-specific basis.

4) Additional LEED credits with moderate-to-high first costs, or that involve significant design challenges, should be evaluated based on the value they add to a project weighed against their first cost implications. Life cycle cost analyses or similar detailed investigations should be performed for measures under serious consideration. Credit synergies and integrated design approaches should be used to maximize the value of the measures pursued, while minimizing their first cost premiums.

5) Project teams should not pursue credits simply to achieve a LEED rating. Credits and combinations of credits should be selected based on the benefits they provide, as well as their contribution to an integrated design solution.

Project teams should be able to justify their approach to LEED, including the specific credits pursued and the overall rating level obtained, based on these general parameters in conjunction with the project program, site conditions, and budget. It is the purpose of this *Applications Guide* to assist project teams in developing such an approach.

Structure and Scope of the Applications Guide

The *Applications Guide* is divided into two main sections. Section 1 summarizes the results of the *GSA LEED Cost Study* using a color-coded table that identifies the categorized cost impacts of each LEED prerequisite and credit. The cost categorization is based on the two building models examined in the *Cost Study*, a new mid-rise Federal Courthouse (five stories, 262,000 GSF) and a mid-rise Federal Office Building modernization (nine stories, 306,600 GSF). The table also includes two "projected" cost impact columns for each prerequisite and credit, which identify the general cost expectations to achieve the points in most GSA office/institutional projects (for new construction and modernizations). The table is intended as an initial "roadmap" of potential credit costs, and includes comments on key cost impact variables that apply to a number of the LEED credits.

Section 2 of the Guide defines an eight-step LEED evaluation process based on the credit cost categorizations. The process is designed to focus a project team's review of all 69 LEED credits by establishing a set of "Initial Considerations" (steps 1-5), followed by a set of "Detailed Evaluations" (steps 6-8). The Initial Considerations steps identify the potential "low-hanging fruit" in a GSA project, e.g., credits that are mandated through GSA's existing P100 Standards, or credits that can typically be earned with no-cost or low-cost impacts. The Detailed Evaluations steps identify credits that will typically require moderate-to-high first cost investments. In addition, the Detailed Evaluations address credits with significant impacts on design efforts, as well as potential credit synergies and integrated design issues.

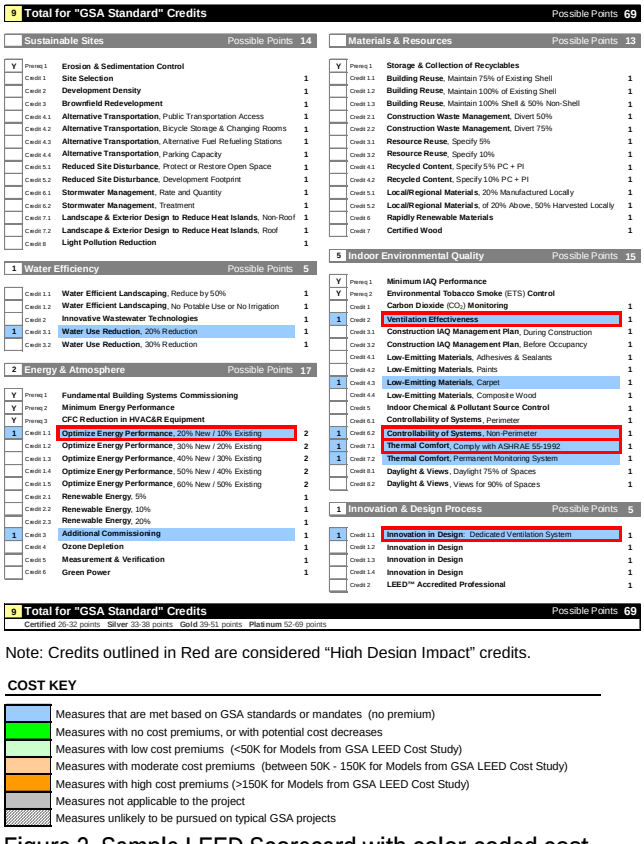
Section 2 uses one of the Courthouse models from the *GSA LEED Cost Study* (specifically the "low-cost" Gold-rated model) to exemplify how the LEED evaluation process can be applied to a GSA project. The LEED evaluation process is illustrated through a series of LEED "Scorecards" (**Figure 2**) that list all of the available prerequisites and credits in the LEED program, with specific credits highlighted that pertain to the corresponding step in the process. The scorecards utilize the same color-coded cost categorizations as the LEED summary table of Section 1. A blank scorecard is also provided in Appendix A for use by project teams in developing their LEED approach.

Overall, the *Applications Guide* illustrates how the cost impact information from the *GSA LEED Cost Study* can support a LEED evaluation process. The *Guide* purposely provides only brief narratives that focus on the evaluation process itself. The *GSA LEED Cost Study* provides more in-depth evaluations of the individual LEED prerequisites and credits, as well as related LEED calculations and detailed cost estimates that clarify the credit cost categorizations used in the *Applications Guide*. The *Applications Guide* also does not attempt to explain the workings of the LEED rating system itself; it is assumed that users have some familiarity with the LEED credits, and have access to the current LEED Rating System and the latest LEED Reference Guide.

It should be noted that while the *GSA LEED Applications Guide* and the *GSA LEED Cost Study* are based on LEED Version 2.1, the principles and evaluation process described herein will likely be appropriate and applicable to future versions of the LEED rating system, should the associated credits remain similar. A re-evaluation of the *Applications Guide* and the *Cost Study* would be required if there are significant changes to the LEED rating system.

Intended Users

The *GSA LEED Applications Guide* can be used by GSA project managers, as well as design and construction teams working on GSA projects. For teams that have experience with both GSA standards and LEED, the *Applications Guide* can serve as a tool to quickly confirm the team's projected LEED targets and general cost impact assumptions. For teams that are less familiar with LEED impacts on GSA projects, the *Applications Guide*—in conjunction with the *GSA LEED Cost Study*—can provide guidance and direction in setting a project's initial LEED goals. In either case, the *Applications Guide* is not intended to limit the design team's consideration of sustainable features or strategies to only those applicable to the LEED Green Building Rating System.



Note: Credits outlined in Red are considered "High Design Impact" credits.

COST KEY

- Measures that are met based on GSA standards or mandates (no premium)
- Measures with no cost premiums, or with potential cost decreases
- Measures with low cost premiums (<50K for Models from GSA LEED Cost Study)
- Measures with moderate cost premiums (between 50K - 150K for Models from GSA LEED Cost Study)
- Measures with high cost premiums (>150K for Models from GSA LEED Cost Study)
- Measures not applicable to the project
- Measures unlikely to be pursued on typical GSA projects

Figure 2. Sample LEED Scorecard with color-coded cost impacts for selected credits (from Section 2 of the Guide)

Section 1:

Credit Cost Impacts From the GSA LEED Cost Study

Overview

The *GSA LEED Cost Study* was commissioned to review the hard- and soft-cost impacts of achieving LEED ratings for two GSA building types, using GSA's established design standards as the point of comparison.

The two building types examined in the study were:

1. A new mid-rise federal Courthouse (five stories, 262,000 GSF, including 15,000 GSF of underground parking; base construction cost is approximately $220/GSF)
2. A mid-rise federal Office Building modernization (nine stories, 306,600 GSF, including 40,700 GSF of underground parking; base construction cost is approximately $130/GSF)

These building types reflect a significant percentage of GSA's planned capital projects over the next five to ten years.

For each of the two building types, baseline construction cost estimates were developed to reflect applicable federal design requirements, as defined in GSA's *Facilities Standards for the Public Buildings Service* (document PBS–P100, 2003), and, for Courthouses, the Administrative Office of the United States Courts' *U. S. Courts Design Guide*. The design standards were also used as the basis for evaluating each LEED prerequisite and credit. An analysis was performed to identify green building measures—above and beyond those included in GSA's standards—that would likely be implemented to meet the specific LEED prerequisite and credit requirements. From these measures, cost impact estimates were developed for each prerequisite and credit, with variations defined for both the Courthouse and Office Building models. The individual credit costs were then categorized, using the following key:

1) GSA mandate (no cost)
2) No Cost/Potential Cost Decrease
3) Low Cost (< $50K)
4) Moderate Cost ($50K-$150K)
5) High Cost (>$150K)

From these individual credit assessments, overall project cost estimates were developed for 12 LEED rating "scenarios" (6 for each building type). The scenarios were defined as follows:

- *New Courthouse*. Two estimates were developed at the Certified, Silver, and Gold rating levels. At each rating level, one "low-cost" and one "high-cost" scenario was defined in order to bracket the LEED costs.

- *Office Building Modernization*. Two estimates were developed at the Certified, Silver, and Gold rating levels. At each rating level, one scenario reflected a "minimal façade renovation" (window replacement, minor repairs) and the other reflected a "full façade renovation" (new cladding and façade design, new windows, new insulation). The different façade scenarios reflect one of the most significant scope variations in GSA's modernization projects and were therefore used as the basis for bracketing the LEED Office Building Modernization costs.

Figure 1-1. Social Security Administration Building Renovation, Woodlawn, Maryland. (LEED Certified Rating)
Architect: Whitman Requardt & Associates

The scenarios were validated by comparing them to the LEED scorecards of actual GSA projects. This ensured that the credits selected for each scenario were feasible and achievable in the GSA context. Appendix C shows a summary of the scorecards for a number of recent GSA LEED projects.

The *GSA LEED Cost Study* therefore provided two key evaluations—the predicted costs of individual LEED prerequisites and credits, and the predicted costs to achieve LEED ratings at the Certified, Silver and Gold rating levels.

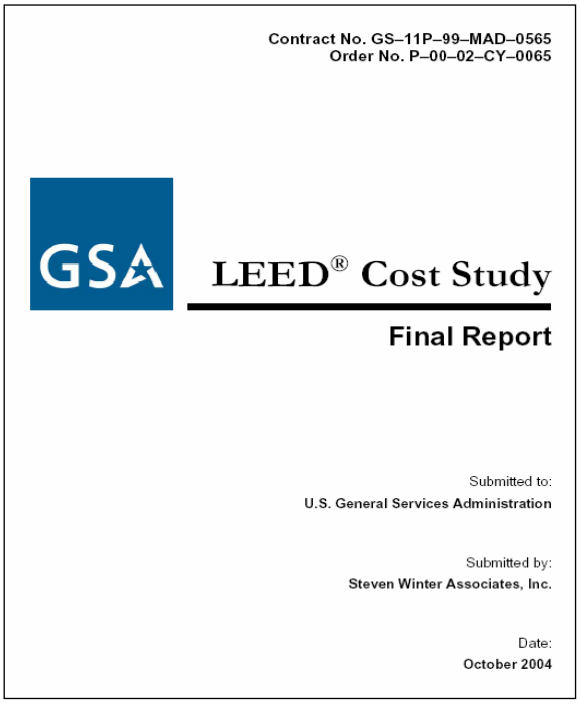


Figure 1-2. GSA LEED® Cost Study, October 2004. This major study for the U.S. General Services Administration evaluates the hard cost and soft cost impacts associated with the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) rating system. Two building types (new construction Courthouse and Federal Office Building modernization) are analyzed at the Certified, Silver, and Gold rating levels.

For the purposes of this *Applications Guide,* it was determined that the data from the *Cost Study* could be used in two significant ways: 1) the prerequisite and credit cost categorizations could provide GSA project teams with a starting point to evaluate potential LEED costs; and 2) the process used to develop the overall LEED ratings in the *Cost Study* could be adapted into a preliminary LEED evaluation process.

Table 1-1 (below) summarizes the prerequisite and credit cost categorizations from the *Cost Study*. The table identifies the range of cost impacts defined for each prerequisite and credit in the New Courthouse and Office Building Modernization scenarios and then projects an expected cost for other GSA office or institutional building types (differentiating new construction and modernization projects). The table is intended as a quick reference for project teams to assess initial LEED costs in the **GSA project context**.

The comments column in **Table 1-1** addresses a key aspect of the cost analysis—the fact that some credits are inherently not applicable to all projects, and the fact that many credits have variable costs that depend on the building type, site, approach to compliance, or other factors. It is incumbent on all GSA project teams to assess the applicability of LEED credits to their specific project and to determine the likely approach that will be taken for credits with highly variable costs. The detailed analyses in the *GSA LEED Cost Study* can act as a useful reference for project teams in making these assessments.

Table 1-1. LEED Credit Cost Impacts (Part 1 of 3)

		IDENTIFIED COST IMPACTS FROM GSA LEED COST STUDY					PROJECTED COST IMPACTS		
		NEW COURTHOUSE		OFFICE BUILDING MODERN'ZTN.			GSA OFFICE OR INSTITUTIONAL BUILDINGS		COMMENTS
ID#	LEED Prerequisite or Credit	Low	High	Min Fac	Full Fac		New	Mod	
SS	**SUSTAINABLE SITES** (14 Possible Points)								
SS-P1	**Erosion and Sedimentation Control**	PRE.	PRE.	PRE.	PRE.		PRE.	PRE.	
SS-1	**Site Selection**	1		1			1	1	Credit may not be available to all GSA projects - depends on specific site.
SS-2	**Development Density**	1		1			1	1	Credit may not be available to all GSA projects - depends on specific site.
SS-3	**Brownfield Redevelopment**	1					1	1	Brownfield remediation costs are assumed to be outside of the LEED scope, therefore no premium.
SS-4.1	**Alternative Transportation**- Public Transportation Access	1	1	1	1		1	1	Credit may not be available to all GSA projects - depends on specific site.
SS-4.2	**Alternative Transportation**- Bicycle Storage & Changing Rooms		1	1	1		1	1	Credit costs can be significantly lower if health club (w/showers) is included in building program.
SS-4.3	**Alternative Transportation**- Alternative Fuel Vehicles				1		1	1	Applicability of charging stations should be reviewed.
SS-4.4	**Alternative Transportation**- Parking Capacity			1	1		1	1	Applicability of carpool spaces should be reviewed.
SS-5.1	**Reduced Site Disturbance**- Protect or Restore Open Space	1					1		Credit may not be available to all GSA projects - depends on specific site.
SS-5.2	**Reduced Site Disturbance**- Development Footprint	1					1	1	Credit may not be available to all GSA projects - depends on specific site.
SS-6.1	**Stormwater Management**- Rate and Quantity	1	1				1	1	Credit costs can vary depending on approach - increased site perviousness versus vegetated roofing system.
SS-6.2	**Stormwater Management-** Treatment		1				1		Credit applicability may be limited by maintenance requirements.
SS-7.1	**Heat Island Effect** - Non-roof	1	1		1		1	1	Credit costs are based on GSA projects with little or no surface parking.
SS-7.2	**Heat Island Effect** - Roof	1	1				1	1	Credit costs can vary depending on approach - Energy Star roofing versus vegetated roofing system.
SS-8	**Light Pollution Reduction**	1					1	1	Credit may not be available to all GSA projects - may conflict with security requirements.
WE	**WATER EFFICIENCY** (5 Possible Points)								
WE-1.1	**Water-Efficient Landscaping -** Reduce by 50%	1	1				1	1	Credit may not be available to all GSA projects - depends on specific site and landscaping requirements.
WE-1.2	**Water-Efficient Landscaping -** No Potable Use or No Irrigation	1					1	1	Credit may not be available to all GSA projects - depends on specific site and landscaping requirements.
WE-2	**Innovative Wastewater Technologies**								
WE-3.1	**Water Use Reduction-** 20% Reduction	1	1	1	1		1	1	
WE-3.2	**Water Use Reduction -** 30% Reduction	1	1	1	1		1	1	

KEY

- Measures that are met based on GSA standards or mandates (no premium)
- Measures with no cost premiums, or with potential cost decreases
- Measures with low cost premiums (<50K for Models from GSA LEED Cost Study)
- Measures with moderate cost premiums (between 50K - 150K for Models from GSA LEED Cost Study)
- Measures with high cost premiums (>150K for Models from GSA LEED Cost Study)
- Measures with variable cost premiums, depending on project conditions
- Measures not applicable to the project
- Measures unlikely to be pursued on typical GSA projects
- Measures not pursued, although technically viable

Table 1-1. LEED Credit Cost Impacts (Part 2 of 3)

		IDENTIFIED COST IMPACTS FROM GSA LEED COST STUDY					PROJECTED COST IMPACTS		
		NEW COURTHOUSE		OFFICE BUILDING MODERN'ZTN.			GSA OFFICE OR INSTITUTIONAL BUILDINGS		COMMENTS
ID#	LEED Prerequisite or Credit	Low	High	Min Fac	Full Fac		New	Mod	
EA	**ENERGY AND ATMOSPHERE** (17 Possible Points)								
EA-P1	**Fundamental Building Systems Commissioning**	PRE.	PRE.	PRE.	PRE.		PRE.	PRE.	
EA-P2	**Minimum Energy Performance**	PRE.	PRE.	PRE.	PRE.		PRE.	PRE.	
EA-P3	**CFC Reduction in HVAC&R Equipment**	PRE.	PRE.	PRE.	PRE.		PRE.	PRE.	
EA-1	**Optimize Energy Performance**	1-2	3 or more	1-4	5 or more		1-10	1-10	GSA's required energy efficiency targets will typically earn 1-3 points.
EA-2	**Renewable Energy**		1	1	1		1	1	
EA-3	**Additional Commissioning**	1	1	1	1		1	1	
EA-4	**Ozone Protection**								GSA defines acceptable HVAC refrigerants through the EPA's Significant New Alternatives Policy, which includes HCFC-22.
EA-5	**Measurement and Verification**	1	1	1	1		1	1	
EA-6	**Green Power**								This credit is considered an Owner's operating issue, rather than a design team issue.
	MATERIALS AND RESOURCES (13 Possible Points)								
MR-P1	**Storage and Collection of Recyclables**	PRE.	PRE.	PRE.	PRE.		PRE.	PRE.	
MR-1.1	**Building Reuse -** Maintain 75% of Existing Walls, Floors and Roof			1				1	Credit may not be available to all GSA modernization projects - depends on scope.
MR-1.2	**Building Reuse -** Maintain 100% of Existing Walls, Floors and Roof			1				1	Credit may not be available to all GSA modernization projects - depends on scope.
MR-1.3	**Building Reuse -** Maintain 100% Shell/Structure & 50% Non-Shell								
MR-2.1	**Construction Waste Management -** Divert 50% from Landfill	1	1	1	1		1	1	Credit costs can vary depending on regional recycling infrastructure and contractor's experience level.
MR-2.2	**Construction Waste Management -** Divert 75% from Landfill	1	1	1			1	1	Credit costs can vary depending on regional recycling infrastructure and contractor's experience level.
MR-3.1	**Resource Reuse -** 5%								
MR-3.2	**Resource Reuse -** 10%								
MR-4.1	**Recycled Content -** 5% (post-consumer + 1/2 post-industrial)	1	1	1	1		1	1	
MR-4.2	**Recycled Content -** 10% (post-consumer + 1/2 post-industrial)	1	1		1		1	1	Credit costs can vary depending on the availability of recycled content materials in the region.
MR-5.1	**Regional Materials -** 20% Manufactured Regionally	1	1	1	1		1	1	Credit costs can vary depending on the availability and cost of regionally manufactured products.
MR-5.2	**Regional Materials -** 50% Extracted Regionally	1		1	1		1	1	Credit costs can vary depending on the availability and cost of regionally extracted or harvested products.
MR-6	**Rapidly Renewable Materials**								
MR- 7	**Certified Wood**		1	1	1		1	1	Credit costs can vary depending on the extent of wood items (doors, millwork, casework) included in the project.

KEY

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- Measures with high cost premiums (>150K for Models from GSA LEED Cost Study)
- Measures with variable cost premiums, depending on project conditions
- Measures unlikely to be pursued on typical GSA projects
- Measures not applicable to the project
- Measures not pursued, although technically viable

Table 1-1. LEED Credit Cost Impacts (Part 3 of 3)

		IDENTIFIED COST IMPACTS FROM GSA LEED COST STUDY					PROJECTED COST IMPACTS		
		NEW COURTHOUSE		OFFICE BUILDING MODERN'ZTN.			GSA OFFICE OR INSTITUTIONAL BUILDINGS		COMMENTS
ID#	LEED Prerequisite or Credit	Low	High	Min Fac	Full Fac		New	Mod	
EQ	**INDOOR ENVIRONMENTAL QUALITY** (15 Possible Points)								
EQ-P1	**Minimum IAQ Performance**	PRE.	PRE.	PRE.	PRE.		PRE.	PRE.	
EQ-P2	**Environmental Tobacco Smoke (ETS) Control**	PRE.	PRE.	PRE.	PRE.		PRE.	PRE.	No cost premium for buildings with a "no smoking" policy.
EQ-1	**Carbon Dioxide Monitoring**	1	1	1	1		1	1	
EQ-2	**Ventilation Effectiveness**	1	1	1	1		1	1	
EQ-3.1	**Construction IAQ Management Plan**- During Construction	1	1	1	1		1	1	
EQ-3.2	**Construction IAQ Management Plan**- Before Occupancy	1	1	1	1		1	1	
EQ-4.1	**Low-Emitting Materials-** Adhesives and Sealants	1	1	1	1		1	1	
EQ-4.2	**Low-Emitting Materials-** Paints and Coatings	1	1	1	1		1	1	
EQ-4.3	**Low-Emitting Materials-** Carpet	1	1	1	1		1	1	
EQ-4.4	**Low-Emitting Materials-** Composite Wood		1	1	1		1	1	Credit costs can vary depending on the extent of engineered wood/agrifiber items (doors, casework) included in the project.
EQ-5	**Indoor Chemical and Pollutant Source Control**	1	1	1	1		1	1	
EQ-6.1	**Controllability of Systems**- Perimeter Spaces			1	1			1	Operable windows unlikely for Courthouses (security issues). Costs can vary for other buildings based on window areas.
EQ-6.2	**Controllability of Systems**- Non-Perimeter Spaces	1	1				1		Achievable on projects with underfloor air delivery systems.
EQ-7.1	**Thermal Comfort-** Compliance with ASHRAE 55-1992	1	1		1		1	1	Credit costs are primarily for humidification systems. GSA requires humidification in Courthouses, but not other facilities.
EQ-7.2	**Thermal Comfort**- Permanent Monitoring System	1	1		1		1	1	Costs for monitoring are assumed to be included as part of Credit EQ-7.1 above.
EQ-8.1	**Daylight and Views-** Daylight 75% of Spaces						1	1	Viability and costs can vary depending on building size, site constraints, security requirements and design strategies.
EQ-8.2	**Daylight and Views-** Views for 90% of Spaces			1			1	1	Viability and costs can vary depending on building size, site constraints, security requirements and design strategies.
ID	**INNOVATION AND DESIGN PROCESS** (5 Possible Points)								
ID-1.1	**Innovation in Design -** Dedicated Ventilation System	1	1	1	1		1	1	
ID-1.2	**Innovation in Design -** Exceed Local Materials Criteria (40%)	1					1	1	Credit costs can vary depending on the availability and cost of regionally manufactured products.
ID-1.3	**Innovation in Design -** Educational Display		1	1	1		1	1	
ID-1.4A	**Innovation in Design -** Exceed Heat Island Effect, Non-Roof criteria		1				1	1	
ID-1.4B	**Innovation in Design -** Exceed Certified Wood criteria (75%)		1		1		1	1	Credit costs can vary depending on the extent of wood items (doors, millwork, casework) included in the project.
ID-2	**LEED Accredited Professional**	1	1	1	1		1	1	

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- Measures not applicable to the project
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- Measures not pursued, although technically viable

Section 2:

LEED Evaluation Process

Process Review

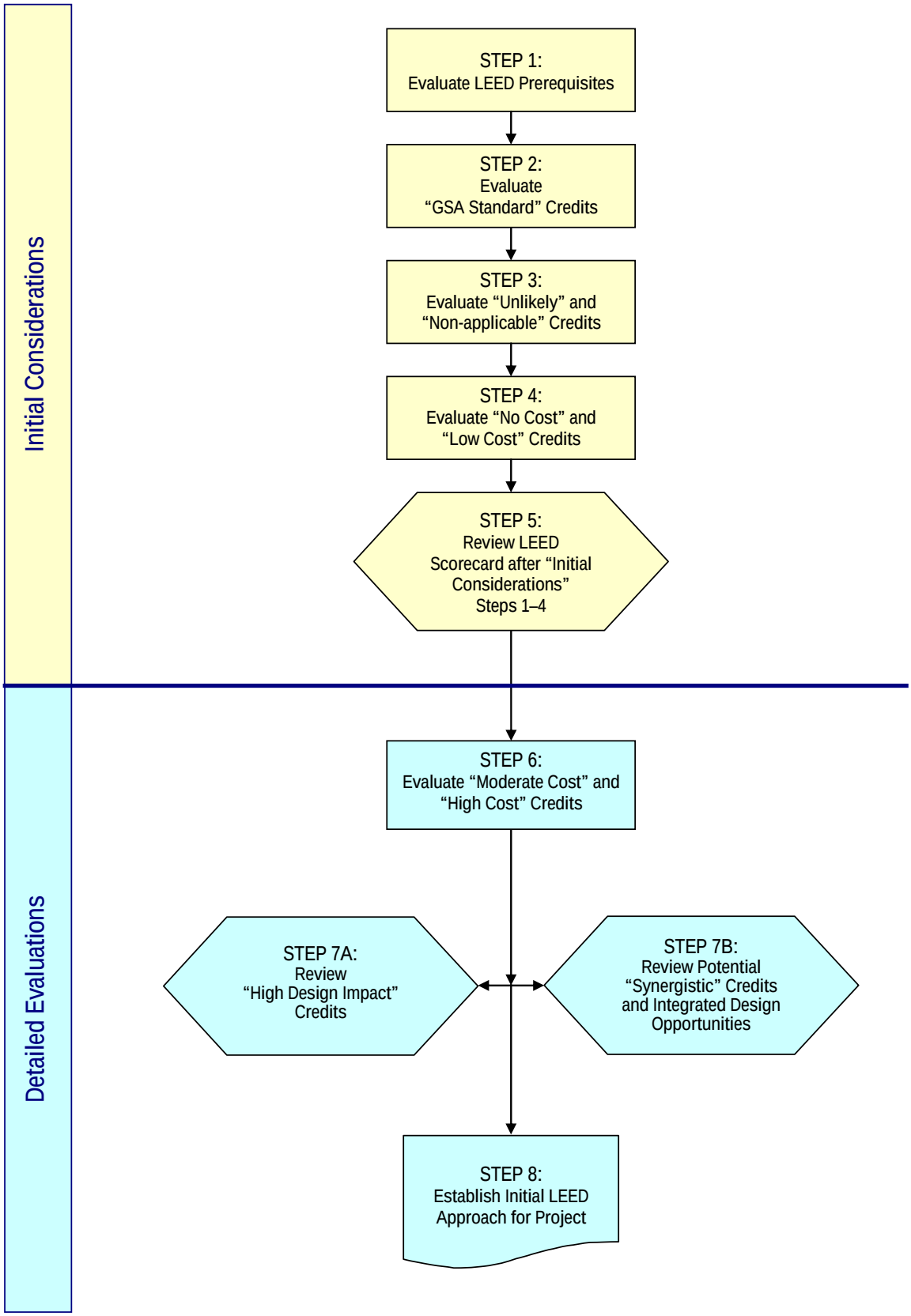
The following section defines an overall process, divided into eight steps, for assessing LEED credits and developing preliminary LEED goals for GSA projects. The process uses the cost impact insights from the *GSA LEED Cost Study* to structure a common sense approach that separates the potential no-cost or low-cost, easily achievable LEED credits from those that have moderate or high potential costs and require more detailed cost/benefit analysis.

Although the process is structured in eight steps, it is intended as a whole. The eight steps are grouped into two main parts, an "Initial Considerations" stage (steps 1-5), and a "Detailed Evaluations" stage (steps 6-8), to clarify the intent (see figure 2-1). In addition, the descriptions in each step are purposely kept brief, so that the entire process can initially be reviewed in less than an hour.
The LEED Evaluation Process uses one of the Courthouse models from the *GSA LEED Cost Study* (specifically the "low-cost" Gold-rated model) to exemplify how the LEED credits can be evaluated and applied to a GSA project. The process is illustrated through a series of LEED "Scorecards" that list all of the available prerequisites and credits in the LEED program, with specific credits highlighted that pertain to the corresponding step in the process. The scorecards utilize the same color-coded cost categorizations as the LEED summary table of Section 1. In addition, a blank scorecard is provided in Appendix A for use by GSA project teams.

Overall, the intent of the LEED Evaluation Process is to assist project teams in attaining the highest LEED rating that is reasonable for their project, while also narrowing their focus to those key issues that require immediate attention during the early design phases. The process should be considered a primer on working with LEED in the GSA project context, rather than a rigorous or overly formulaic approach to LEED or green building design.

Project teams are encouraged to visit the Whole Building Design Guide (WBDG) at www.wbdg.org to obtain information and resources on integrated (or 'whole building') design, and on the strategies and technologies used to achieve LEED credits. Other web-based resources are listed in Appendix B.

Figure 2-1. LEED Evaluation Process for GSA Projects



Initial Considerations

Step 1:

Evaluate LEED Prerequisites

The LEED rating system includes seven mandatory prerequisites, which apply to all projects. As such, it is useful for project teams to assess the prerequisites as a first priority in order to determine how compliance will be achieved.

Example

Table 2-1 summarizes the cost impacts identified for each of the seven prerequisites in the "Low-Cost" Gold-rated Courthouse model of the *GSA LEED Cost Study*. As the table indicates, five of the seven prerequisites are expected to be earned at no additional cost due to GSA's existing design requirements and building commissioning protocols. In addition, the Erosion and Sedimentation Control prerequisite (under the Sustainable Sites category) is expected to be achieved with no cost impact.

The one item identified as having a potential "low cost" impact is EQ Prerequisite 2: Environmental Tobacco Smoke Control. Most GSA projects will achieve this credit at no cost by prohibiting smoking within the building and at the building exterior near entryways, operable windows, or air intakes. GSA standards and Executive Order 13058 do, however, currently allow for smoking rooms in federal facilities (e.g., at Judge's Chambers in a Courthouse). Per P100, smoking rooms in GSA buildings are to be operated under negative pressure and exhausted directly to the outdoors, which is consistent with LEED requirements. A cost premium is expected, however, to provide tracer gas testing for each designated smoking room—this is a LEED requirement that is not part of the P100 guidelines.

Application to GSA Projects

The cost classifications identified in **Table 2-1** are expected to apply to most GSA projects.

Figure 2-2. Recycling room storage at the U.S. EPA New England Regional Laboratory, Chelmsford, Massachusetts. Dedicated recycling collection and storage areas meeting the LEED Materials and Resources Prerequisite are required through GSA's P100 Design Standards. (Photo: Don Horn)

Table 2-1. LEED Prerequisites ("Low Cost" Courthouse Model)

7 Prerequisites — Possible Points **69**

Sustainable Sites — Possible Points 14

Y	Prereq 1	**Erosion & Sedimentation Control**	
	Credit 1	**Site Selection**	1
	Credit 2	**Development Density**	1
	Credit 3	**Brownfield Redevelopment**	1
	Credit 4.1	**Alternative Transportation**, Public Transportation Access	1
	Credit 4.2	**Alternative Transportation**, Bicycle Storage & Changing Rooms	1
	Credit 4.3	**Alternative Transportation**, Alternative Fuel Refueling Stations	1
	Credit 4.4	**Alternative Transportation**, Parking Capacity	1
	Credit 5.1	**Reduced Site Disturbance**, Protect or Restore Open Space	1
	Credit 5.2	**Reduced Site Disturbance**, Development Footprint	1
	Credit 6.1	**Stormwater Management**, Rate and Quantity	1
	Credit 6.2	**Stormwater Management**, Treatment	1
	Credit 7.1	**Landscape & Exterior Design to Reduce Heat Islands**, Non-Roof	1
	Credit 7.2	**Landscape & Exterior Design to Reduce Heat Islands**, Roof	1
	Credit 8	**Light Pollution Reduction**	1

Water Efficiency — Possible Points 5

	Credit 1.1	**Water Efficient Landscaping**, Reduce by 50%	1
	Credit 1.2	**Water Efficient Landscaping**, No Potable Use or No Irrigation	1
	Credit 2	**Innovative Wastewater Technologies**	1
	Credit 3.1	**Water Use Reduction**, 20% Reduction	1
	Credit 3.2	**Water Use Reduction**, 30% Reduction	1

Energy & Atmosphere — Possible Points 17

Y	Prereq 1	**Fundamental Building Systems Commissioning**	
Y	Prereq 2	**Minimum Energy Performance**	
Y	Prereq 3	**CFC Reduction in HVAC&R Equipment**	
	Credit 1.1	**Optimize Energy Performance**, 20% New / 10% Existing	2
	Credit 1.2	**Optimize Energy Performance**, 30% New / 20% Existing	2
	Credit 1.3	**Optimize Energy Performance**, 40% New / 30% Existing	2
	Credit 1.4	**Optimize Energy Performance**, 50% New / 40% Existing	2
	Credit 1.5	**Optimize Energy Performance**, 60% New / 50% Existing	2
	Credit 2.1	**Renewable Energy**, 5%	1
	Credit 2.2	**Renewable Energy**, 10%	1
	Credit 2.3	**Renewable Energy**, 20%	1
	Credit 3	**Additional Commissioning**	1
	Credit 4	**Ozone Depletion**	1
	Credit 5	**Measurement & Verification**	1
	Credit 6	**Green Power**	1

Materials & Resources — Possible Points 13

Y	Prereq 1	**Storage & Collection of Recyclables**	
	Credit 1.1	**Building Reuse**, Maintain 75% of Existing Shell	1
	Credit 1.2	**Building Reuse**, Maintain 100% of Existing Shell	1
	Credit 1.3	**Building Reuse**, Maintain 100% Shell & 50% Non-Shell	1
	Credit 2.1	**Construction Waste Management**, Divert 50%	1
	Credit 2.2	**Construction Waste Management**, Divert 75%	1
	Credit 3.1	**Resource Reuse**, Specify 5%	1
	Credit 3.2	**Resource Reuse**, Specify 10%	1
	Credit 4.1	**Recycled Content**, Specify 5% PC + PI	1
	Credit 4.2	**Recycled Content**, Specify 10% PC + PI	1
	Credit 5.1	**Local/Regional Materials**, 20% Manufactured Locally	1
	Credit 5.2	**Local/Regional Materials**, of 20% Above, 50% Harvested Locally	1
	Credit 6	**Rapidly Renewable Materials**	1
	Credit 7	**Certified Wood**	1

Indoor Environmental Quality — Possible Points 15

Y	Prereq 1	**Minimum IAQ Performance**	
Y	Prereq 2	**Environmental Tobacco Smoke** (ETS) **Control**	
	Credit 1	**Carbon Dioxide** (CO_2) **Monitoring**	1
	Credit 2	**Ventilation Effectiveness**	1
	Credit 3.1	**Construction IAQ Management Plan**, During Construction	1
	Credit 3.2	**Construction IAQ Management Plan**, Before Occupancy	1
	Credit 4.1	**Low-Emitting Materials**, Adhesives & Sealants	1
	Credit 4.2	**Low-Emitting Materials**, Paints	1
	Credit 4.3	**Low-Emitting Materials**, Carpet	1
	Credit 4.4	**Low-Emitting Materials**, Composite Wood	1
	Credit 5	**Indoor Chemical & Pollutant Source Control**	1
	Credit 6.1	**Controllability of Systems**, Perimeter	1
	Credit 6.2	**Controllability of Systems**, Non-Perimeter	1
	Credit 7.1	**Thermal Comfort**, Comply with ASHRAE 55-1992	1
	Credit 7.2	**Thermal Comfort**, Permanent Monitoring System	1
	Credit 8.1	**Daylight & Views**, Daylight 75% of Spaces	1
	Credit 8.2	**Daylight & Views**, Views for 90% of Spaces	1

Innovation & Design Process — Possible Points 5

	Credit 1.1	**Innovation in Design**	1
	Credit 1.2	**Innovation in Design**	1
	Credit 1.3	**Innovation in Design**	1
	Credit 1.4	**Innovation in Design**	1
	Credit 2	**LEED™ Accredited Professional**	1

7 Prerequisites — Possible Points **69**

Certified 26-32 points **Silver** 33-38 points **Gold** 39-51 points **Platinum** 52-69 points

Cost Key

- Measures that are met based on GSA standards or mandates (no premium)
- Measures with no cost premiums, or with potential cost decreases
- Measures with low cost premiums (<50K for Models from GSA LEED Cost Study)
- Measures with moderate cost premiums (between 50K - 150K for Models from GSA LEED Cost Study)
- Measures with high cost premiums (>150K for Models from GSA LEED Cost Study)
- Measures not applicable to the project
- Measures unlikely to be pursued on typical GSA projects

Step 2:

Evaluate "GSA Standard" Credits

The *Facilities Standards for the Public Buildings Service* (document PBS–P100, 2003) identifies Sustainability and Energy Performance as basic tenets of the GSA's General Design Philosophy. To support these tenets, P100 includes a number of specific sustainable design requirements, ranging from design features to performance goals to specific building technologies. A number of these P100 design standards meet or exceed the criteria of individual LEED credits, thereby allowing projects to earn the credits with, effectively, no cost premium. In addition to the P100 measures, GSA buildings sometimes include specific programmatic requirements that also coincide with LEED credit criteria. It is therefore important for project teams to both identify (at an early stage) and incorporate the "GSA Standard" credits that apply to their project.

Example

Table 2-2 summarizes the "GSA Standard" credits identified in the "Low-Cost" Gold-rated Courthouse model of the *GSA LEED Cost Study*. It is noteworthy that of the nine credits identified in this example, five have potentially significant design implications, and must therefore be addressed by project teams early in the design process. The design-related issues in this example include:

- The project's approach to energy-efficiency (Credit EA-1.1)
- The design implications (architectural, mechanical) of an underfloor air delivery system with dedicated ventilation units on each floor (Credits EQ-2 , EQ-6.2, and ID-1,1)
- The design implications (particularly to the exterior envelope assemblies) of building-wide humidification (Credit EQ-7.1)

Other GSA-mandated measures, such as water-efficient plumbing fixtures and low-emission carpets, primarily involve material or equipment selection and specification.

Application to GSA Projects

It is expected that most GSA projects will have similar combinations of design-related and selection/specification-related credits in the "GSA Standard" category.

Figure 2-3. GSA's Facilities Standards for the Public Buildings Service (document PBS-P100, 2003). Includes a number of requirements that directly contribute to LEED credits.

Table 2-2. "GSA Standard" Credits (Low Cost Courthouse Model)

9	**Total for "GSA Standard" Credits**	Possible Points	**69**

Sustainable Sites — Possible Points 14

Y	Prereq 1	**Erosion & Sedimentation Control**	
	Credit 1	**Site Selection**	1
	Credit 2	**Development Density**	1
	Credit 3	**Brownfield Redevelopment**	1
	Credit 4.1	**Alternative Transportation**, Public Transportation Access	1
	Credit 4.2	**Alternative Transportation**, Bicycle Storage & Changing Rooms	1
	Credit 4.3	**Alternative Transportation**, Alternative Fuel Refueling Stations	1
	Credit 4.4	**Alternative Transportation**, Parking Capacity	1
	Credit 5.1	**Reduced Site Disturbance**, Protect or Restore Open Space	1
	Credit 5.2	**Reduced Site Disturbance**, Development Footprint	1
	Credit 6.1	**Stormwater Management**, Rate and Quantity	1
	Credit 6.2	**Stormwater Management**, Treatment	1
	Credit 7.1	**Landscape & Exterior Design to Reduce Heat Islands**, Non-Roof	1
	Credit 7.2	**Landscape & Exterior Design to Reduce Heat Islands**, Roof	1
	Credit 8	**Light Pollution Reduction**	1

Water Efficiency — Possible Points 5

	Credit 1.1	**Water Efficient Landscaping**, Reduce by 50%	1
	Credit 1.2	**Water Efficient Landscaping**, No Potable Use or No Irrigation	1
	Credit 2	**Innovative Wastewater Technologies**	1
1	Credit 3.1	**Water Use Reduction**, 20% Reduction	1
	Credit 3.2	**Water Use Reduction**, 30% Reduction	1

Energy & Atmosphere — Possible Points 17

Y	Prereq 1	**Fundamental Building Systems Commissioning**	
Y	Prereq 2	**Minimum Energy Performance**	
Y	Prereq 3	**CFC Reduction in HVAC&R Equipment**	
1	Credit 1.1	**Optimize Energy Performance**, 20% New / 10% Existing	2
	Credit 1.2	**Optimize Energy Performance**, 30% New / 20% Existing	2
	Credit 1.3	**Optimize Energy Performance**, 40% New / 30% Existing	2
	Credit 1.4	**Optimize Energy Performance**, 50% New / 40% Existing	2
	Credit 1.5	**Optimize Energy Performance**, 60% New / 50% Existing	2
	Credit 2.1	**Renewable Energy**, 5%	1
	Credit 2.2	**Renewable Energy**, 10%	1
	Credit 2.3	**Renewable Energy**, 20%	1
1	Credit 3	**Additional Commissioning**	1
	Credit 4	**Ozone Depletion**	1
	Credit 5	**Measurement & Verification**	1
	Credit 6	**Green Power**	1

Materials & Resources — Possible Points 13

Y	Prereq 1	**Storage & Collection of Recyclables**	
	Credit 1.1	**Building Reuse**, Maintain 75% of Existing Shell	1
	Credit 1.2	**Building Reuse**, Maintain 100% of Existing Shell	1
	Credit 1.3	**Building Reuse**, Maintain 100% Shell & 50% Non-Shell	1
	Credit 2.1	**Construction Waste Management**, Divert 50%	1
	Credit 2.2	**Construction Waste Management**, Divert 75%	1
	Credit 3.1	**Resource Reuse**, Specify 5%	1
	Credit 3.2	**Resource Reuse**, Specify 10%	1
	Credit 4.1	**Recycled Content**, Specify 5% PC + PI	1
	Credit 4.2	**Recycled Content**, Specify 10% PC + PI	1
	Credit 5.1	**Local/Regional Materials**, 20% Manufactured Locally	1
	Credit 5.2	**Local/Regional Materials**, of 20% Above, 50% Harvested Locally	1
	Credit 6	**Rapidly Renewable Materials**	1
	Credit 7	**Certified Wood**	1

Indoor Environmental Quality — Possible Points 15

Y	Prereq 1	**Minimum IAQ Performance**	
Y	Prereq 2	**Environmental Tobacco Smoke** (ETS) **Control**	
	Credit 1	**Carbon Dioxide** (CO_2) **Monitoring**	1
1	Credit 2	**Ventilation Effectiveness**	1
	Credit 3.1	**Construction IAQ Management Plan**, During Construction	1
	Credit 3.2	**Construction IAQ Management Plan**, Before Occupancy	1
	Credit 4.1	**Low-Emitting Materials**, Adhesives & Sealants	1
	Credit 4.2	**Low-Emitting Materials**, Paints	1
1	Credit 4.3	**Low-Emitting Materials**, Carpet	1
	Credit 4.4	**Low-Emitting Materials**, Composite Wood	1
	Credit 5	**Indoor Chemical & Pollutant Source Control**	1
	Credit 6.1	**Controllability of Systems**, Perimeter	1
1	Credit 6.2	**Controllability of Systems**, Non-Perimeter	1
1	Credit 7.1	**Thermal Comfort**, Comply with ASHRAE 55-1992	1
1	Credit 7.2	**Thermal Comfort**, Permanent Monitoring System	1
	Credit 8.1	**Daylight & Views**, Daylight 75% of Spaces	1
	Credit 8.2	**Daylight & Views**, Views for 90% of Spaces	1

Innovation & Design Process — Possible Points 5

1	Credit 1.1	**Innovation in Design**: Dedicated Ventilation System	1
	Credit 1.2	**Innovation in Design**	1
	Credit 1.3	**Innovation in Design**	1
	Credit 1.4	**Innovation in Design**	1
	Credit 2	**LEED™ Accredited Professional**	1

9	**Total for "GSA Standard" Credits**	Possible Points	**69**

Certified 26-32 points **Silver** 33-38 points **Gold** 39-51 points **Platinum** 52-69 points

Note: Credits outlined in Red are considered "High Design Impact" credits.

Cost Key

- Measures that are met based on GSA standards or mandates (no premium)
- Measures with no cost premiums, or with potential cost decreases
- Measures with low cost premiums (<50K for Models from GSA LEED Cost Study)
- Measures with moderate cost premiums (between 50K - 150K for Models from GSA LEED Cost Study)
- Measures with high cost premiums (>150K for Models from GSA LEED Cost Study)
- Measures not applicable to the project
- Measures unlikely to be pursued on typical GSA projects

Step 3:

Evaluate "Unlikely" and "Non-applicable" Credits

In all LEED projects it is inevitable that some of the available credits will not be applicable. This is due, in part, to the design of the LEED system itself. The rating system includes, for instance, credits targeted to building reuse that do not apply to new construction projects, as well as credits targeted to dense urban sites that will typically be unachievable in suburban or rural settings. Other project variables that can cause credits to become non-applicable to GSA projects include:

- The building type and programmatic requirements (e.g., courthouse vs. office building vs. laboratory, vs. border station)
- The project scope (e.g., exclusion of site renovation and roof replacement in an office modernization scope)
- GSA standards and policies, including those related to facility security

In addition to non-applicable credits, there are often a few LEED credits that a project team will quickly determine are "unlikely" due to first cost impacts, maintenance considerations, or other reasons. To focus the project team's LEED efforts, it is useful to identify these unlikely and non-applicable credits during the Initial Considerations stage.

Example

Table 2-3 summarizes the 14 unlikely and non-applicable credits identified in the "Low-Cost" Gold-rated Courthouse model of the *GSA LEED Cost Study*. Of the eight non-applicable credits, five are due to GSA-specific issues. For instance, LEED Credit EQ-6.1 (Controllability of Systems, Perimeter) was excluded because the credit requires the installation of operable windows. GSA's current security requirements generally prohibit the extensive use of operable windows in a Federal Courthouse. Similarly, Credit SS-4.4 (Alternative Transportation, Parking Capacity) was excluded because carpooling was not considered viable in the Federal Courthouse context (parking spaces and access are only provided for judges, court officers, and others with high security clearance).

An example of an unlikely measure is Credit WE-2 (Innovative Wastewater Technologies). The credit was considered unlikely for the Courthouse due to the expected high initial costs of an on-site wastewater treatment system, which would be difficult to justify economically in an urban site with existing infrastructure.[1]

Non-applicable and unlikely credits need to be assessed on a project by project basis, as general credit assumptions may not apply to specific projects. For instance, credit EA-4 (Ozone Depletion) was excluded in the *GSA LEED Cost Study* because GSA defines acceptable HVAC refrigerants through the EPA's Significant New Alternatives Policy (SNAP). The SNAP refrigerant alternatives include HCFC-123 and HCFC-22, which (at the time of the analysis) did not qualify under the LEED credit criteria. In actual projects, however, it is possible to install HVAC equipment that will comply with the credit requirements. As another example, credit EA-6 (Green Power) was categorized as non-applicable because it was considered an operational issue outside the scope of the *GSA LEED Cost Study*. In actuality, some GSA regions do purchase green power, which could potentially be attributed to a LEED project to meet the Green Power credit requirements.

[1] The credit, however, might be feasible for buildings located on remote sites, such as some of GSA's Land Port of Entry (Border Station) projects.

Application to GSA Projects

It is expected that all GSA projects will have similar issues that will cause certain credits to be categorized as non-applicable or unlikely. Project teams should be careful, however, not to rule out credits or strategies before they have been given adequate consideration within an integrated design approach (as described in step 7). In some cases, it comes down to a matter of choice and availability. For example, although GSA does not exclude HCFC refrigerants, project teams can specify HVAC, refrigeration, and fire suppression systems that do not contain HCFCs or Halons to meet the requirements of Credit EA-4 (Ozone Depletion). Likewise, where GSA is already purchasing green power, it is a matter of verifying the Green-e certification required under LEED, and applying it toward the specific LEED project to meet the requirements of Credit EA-6 (Green Power).

Figure 2-4. U.S. EPA New England Regional Laboratory, Chelmsford, Massachusetts (LEED Gold Rating, Version 1.0)
Wind-powered electricity from Vermont and New York was purchased by EPA to match the electrical consumption of the new facility, enabling achievement of a LEED credit for green power (Credit EA-6, Green Power).
(Photo: Don Horn)

Table 2-3. "Unlikely" or "Non-applicable" Credits ("Low Cost" Courthouse Model)

14 Total for "Unlikley" or "Non-Applicable" Credits — Possible Points **69**

2 Sustainable Sites — Possible Points **14**

	Prereq 1	**Erosion & Sedimentation Control**	
	Credit 1	**Site Selection**	1
	Credit 2	**Development Density**	1
	Credit 3	**Brownfield Redevelopment**	1
	Credit 4.1	**Alternative Transportation**, Public Transportation Access	1
	Credit 4.2	**Alternative Transportation**, Bicycle Storage & Changing Rooms	1
1	Credit 4.3	**Alternative Transportation**, Alternative Fuel Refueling Stations	1
1	Credit 4.4	**Alternative Transportation**, Parking Capacity	1
	Credit 5.1	**Reduced Site Disturbance**, Protect or Restore Open Space	1
	Credit 5.2	**Reduced Site Disturbance**, Development Footprint	1
	Credit 6.1	**Stormwater Management**, Rate and Quantity	1
	Credit 6.2	**Stormwater Management**, Treatment	1
	Credit 7.1	**Landscape & Exterior Design to Reduce Heat Islands**, Non-Roof	1
	Credit 7.2	**Landscape & Exterior Design to Reduce Heat Islands**, Roof	1
	Credit 8	**Light Pollution Reduction**	1

1 Water Efficiency — Possible Points **5**

	Credit 1.1	**Water Efficient Landscaping**, Reduce by 50%	1
	Credit 1.2	**Water Efficient Landscaping**, No Potable Use or No Irrigation	1
1	Credit 2	**Innovative Wastewater Technologies**	1
	Credit 3.1	**Water Use Reduction**, 20% Reduction	1
	Credit 3.2	**Water Use Reduction**, 30% Reduction	1

4 Energy & Atmosphere — Possible Points **17**

	Prereq 1	**Fundamental Building Systems Commissioning**	
	Prereq 2	**Minimum Energy Performance**	
	Prereq 3	**CFC Reduction in HVAC&R Equipment**	
	Credit 1.1	**Optimize Energy Performance**, 20% New / 10% Existing	2
	Credit 1.2	**Optimize Energy Performance**, 30% New / 20% Existing	2
	Credit 1.3	**Optimize Energy Performance**, 40% New / 30% Existing	2
	Credit 1.4	**Optimize Energy Performance**, 50% New / 40% Existing	2
	Credit 1.5	**Optimize Energy Performance**, 60% New / 50% Existing	2
	Credit 2.1	**Renewable Energy**, 5%	1
1	Credit 2.2	**Renewable Energy**, 10%	1
1	Credit 2.3	**Renewable Energy**, 20%	1
	Credit 3	**Additional Commissioning**	1
1	Credit 4	**Ozone Depletion**	1
	Credit 5	**Measurement & Verification**	1
1	Credit 6	**Green Power**	1

6 Materials & Resources — Possible Points **13**

	Prereq 1	**Storage & Collection of Recyclables**	
1	Credit 1.1	**Building Reuse**, Maintain 75% of Existing Shell	1
1	Credit 1.2	**Building Reuse**, Maintain 100% of Existing Shell	1
1	Credit 1.3	**Building Reuse**, Maintain 100% Shell & 50% Non-Shell	1
	Credit 2.1	**Construction Waste Management**, Divert 50%	1
	Credit 2.2	**Construction Waste Management**, Divert 75%	1
1	Credit 3.1	**Resource Reuse**, Specify 5%	1
1	Credit 3.2	**Resource Reuse**, Specify 10%	1
	Credit 4.1	**Recycled Content**, Specify 5% PC + PI	1
	Credit 4.2	**Recycled Content**, Specify 10% PC + PI	1
	Credit 5.1	**Local/Regional Materials**, 20% Manufactured Locally	1
	Credit 5.2	**Local/Regional Materials**, of 20% Above, 50% Harvested Locally	1
1	Credit 6	**Rapidly Renewable Materials**	1
	Credit 7	**Certified Wood**	1

1 Indoor Environmental Quality — Possible Points **15**

	Prereq 1	**Minimum IAQ Performance**	
	Prereq 2	**Environmental Tobacco Smoke** (ETS) **Control**	
	Credit 1	**Carbon Dioxide** (CO_2) **Monitoring**	1
	Credit 2	**Ventilation Effectiveness**	1
	Credit 3.1	**Construction IAQ Management Plan**, During Construction	1
	Credit 3.2	**Construction IAQ Management Plan**, Before Occupancy	1
	Credit 4.1	**Low-Emitting Materials**, Adhesives & Sealants	1
	Credit 4.2	**Low-Emitting Materials**, Paints	1
	Credit 4.3	**Low-Emitting Materials**, Carpet	1
	Credit 4.4	**Low-Emitting Materials**, Composite Wood	1
	Credit 5	**Indoor Chemical & Pollutant Source Control**	1
1	Credit 6.1	**Controllability of Systems**, Perimeter	1
	Credit 6.2	**Controllability of Systems**, Non-Perimeter	1
	Credit 7.1	**Thermal Comfort**, Comply with ASHRAE 55-1992	1
	Credit 7.2	**Thermal Comfort**, Permanent Monitoring System	1
	Credit 8.1	**Daylight & Views**, Daylight 75% of Spaces	1
	Credit 8.2	**Daylight & Views**, Views for 90% of Spaces	1

Innovation & Design Process — Possible Points **5**

	Credit 1.1	**Innovation in Design**	1
	Credit 1.2	**Innovation in Design**	1
	Credit 1.3	**Innovation in Design**	1
	Credit 1.4	**Innovation in Design**	1
	Credit 2	**LEED™ Accredited Professional**	1

14 Total for "Unlikley" or "Non-Applicable" Credits — Possible Points **69**

Certified 26-32 points **Silver** 33-38 points **Gold** 39-51 points **Platinum** 52-69 points

Cost Key

- Measures that are met based on GSA standards or mandates (no premium)
- Measures with no cost premiums, or with potential cost decreases
- Measures with low cost premiums (<50K for Models from GSA LEED Cost Study)
- Measures with moderate cost premiums (between 50K - 150K for Models from GSA LEED Cost Study)
- Measures with high cost premiums (>150K for Models from GSA LEED Cost Study)
- Measures not applicable to the project
- Measures unlikely to be pursued on typical GSA projects

Step 4:

Evaluate "No-Cost" and "Low-Cost" Credits

In most GSA projects, there will be a number of LEED credits that can be achieved with no construction cost impact, even though the credit requirements are not specifically part of GSA's design standards. A few of the LEED credits may even result in reduced first costs. In addition, the models examined in the *GSA LEED Cost Study* revealed that a number of other LEED credits can be achieved with "low" construction cost impacts[2]. These "no-cost" and "low-cost" credits present significant opportunities to project teams. As such, they should be identified and planned for early in the design process.

Example

Table 2-4 summarizes the "no-cost" and "low-cost" credits identified in the "Low-Cost" Gold-rated Courthouse model of the *GSA LEED Cost Study*. The no-cost/low-cost categorization of these credits can generally be accounted for as follows:

1) *Advantageous Site.* On many LEED projects, the characteristics of the project site can earn credits in the Sustainable Sites category with no- or low-cost impacts. In the Courthouse model, for instance, the building is assumed to be located in a downtown urban location, with ample access to public transit. This earns the project Credits SS-1 (Site Selection), SS-2 (Development Density) and SS-4.1 (Alternative Transportation, Public Transportation Access). As with many of GSA's new Courthouse projects, the model is also assumed to be built on a previously developed site, with some site remediation required. This earns Credit SS-3 (Brownfield Redevelopment) at no-cost premium, as the remediation is considered a general site development cost, not specific to LEED.

Figure 2-5. Alfred A. Arraj U.S. Courthouse, Denver, Colorado. GSA buildings are typically located in urban settings, facilitating achievement of the LEED Sustainable Site Credit 2: Development Density at no cost. (Photo: Don Horn)

2) *No-Cost/Low-Cost Design Opportunities.* A number of LEED credits can potentially be achieved at no or low costs through smart planning and integrated design. In the Courthouse model, for example, three of the Sustainable Sites credits (SS-5.1, SS-5.2, and SS-6.1) can be achieved by limiting the amount of paved area on the site and by planting native and adaptive plant species for the majority of the landscaping. Using native, adaptive plant species can also eliminate the need for permanent irrigation systems and earn Credits WE-1.1 and WE-1.2. Design integration can

[2] In the *GSA LEED Cost Study*, the "low-cost" category was defined for credits that had a construction cost premium under $50,000. This is based on projects that had baseline constructions costs in the range of $40-60 million.

achieve all five of the credits mentioned above within a comprehensive landscaping scheme. The resulting design does not necessarily add a project premium—in fact, in the Courthouse model it actually reduced the overall site development costs.

Figures 2-6 and 2-7. Landscaping at the Alfred A. Arraj U.S. Courthouse, Denver, Colorado. A comprehensive landscaping scheme using native and adapted plant species, minimal paved areas, and no permanent irrigation can reduce overall development costs. (Photo: Don Horn)

Design opportunities were also identified for energy efficiency (Credit EA-1) and exterior lighting design (Credit SS-8), which allowed the Courthouse to earn additional points at no cost increase.

3) *Market Transformation of Materials and Equipment.* The growing demand for high-performance buildings has led a number of product manufacturers to increase their "green" material and equipment offerings. Over time, many of these products have become cost competitive with comparable "standard" products. Because of these developments, LEED credits such as SS-7.1 (Heat Island Reduction – Energy Star Roofing), EQ-4.1 (Low-emission Adhesives and Sealants), EQ-4.2 (Low-emission Paints) and MR-4.1/4.2 (Recycled Content Materials) can often be achieved at no- or low-cost premiums.

Application to GSA Projects

Similar "no-cost" and "low-cost" credit opportunities are expected to apply to most GSA building types and projects.

Table 2-4. "No-Cost" and "Low-Cost" Credits

26 Total for "No Cost" and "Low Cost" Credits — Possible Points **69**

10 Sustainable Sites — Possible Points 14

Y	Prereq 1	**Erosion & Sedimentation Control**	
1	Credit 1	**Site Selection**	1
1	Credit 2	**Development Density**	1
1	Credit 3	**Brownfield Redevelopment**	1
1	Credit 4.1	**Alternative Transportation**, Public Transportation Access	1
	Credit 4.2	**Alternative Transportation**, Bicycle Storage & Changing Rooms	1
	Credit 4.3	**Alternative Transportation**, Alternative Fuel Refueling Stations	1
	Credit 4.4	**Alternative Transportation**, Parking Capacity	1
1	Credit 5.1	**Reduced Site Disturbance**, Protect or Restore Open Space	1
1	Credit 5.2	**Reduced Site Disturbance**, Development Footprint	1
1	Credit 6.1	**Stormwater Management**, Rate and Quantity	1
	Credit 6.2	**Stormwater Management**, Treatment	1
1	Credit 7.1	**Landscape & Exterior Design to Reduce Heat Islands**, Non-Roof	1
1	Credit 7.2	**Landscape & Exterior Design to Reduce Heat Islands**, Roof	1
1	Credit 8	**Light Pollution Reduction**	1

2 Water Efficiency — Possible Points 5

1	Credit 1.1	**Water Efficient Landscaping**, Reduce by 50%	1
1	Credit 1.2	**Water Efficient Landscaping**, No Potable Use or No Irrigation	1
	Credit 2	**Innovative Wastewater Technologies**	1
	Credit 3.1	**Water Use Reduction**, 20% Reduction	1
	Credit 3.2	**Water Use Reduction**, 30% Reduction	1

1 Energy & Atmosphere — Possible Points 17

Y	Prereq 1	**Fundamental Building Systems Commissioning**	
Y	Prereq 2	**Minimum Energy Performance**	
Y	Prereq 3	**CFC Reduction in HVAC&R Equipment**	
1	Credit 1.1	**Optimize Energy Performance**, 20% New / 10% Existing	2
	Credit 1.2	**Optimize Energy Performance**, 30% New / 20% Existing	2
	Credit 1.3	**Optimize Energy Performance**, 40% New / 30% Existing	2
	Credit 1.4	**Optimize Energy Performance**, 50% New / 40% Existing	2
	Credit 1.5	**Optimize Energy Performance**, 60% New / 50% Existing	2
	Credit 2.1	**Renewable Energy**, 5%	1
	Credit 2.2	**Renewable Energy**, 10%	1
	Credit 2.3	**Renewable Energy**, 20%	1
	Credit 3	**Additional Commissioning**	1
	Credit 4	**Ozone Depletion**	1
	Credit 5	**Measurement & Verification**	1
	Credit 6	**Green Power**	1

6 Materials & Resources — Possible Points 13

Y	Prereq 1	**Storage & Collection of Recyclables**	
	Credit 1.1	**Building Reuse**, Maintain 75% of Existing Shell	1
	Credit 1.2	**Building Reuse**, Maintain 100% of Existing Shell	1
	Credit 1.3	**Building Reuse**, Maintain 100% Shell & 50% Non-Shell	1
1	Credit 2.1	**Construction Waste Management**, Divert 50%	1
1	Credit 2.2	**Construction Waste Management**, Divert 75%	1
	Credit 3.1	**Resource Reuse**, Specify 5%	1
	Credit 3.2	**Resource Reuse**, Specify 10%	1
1	Credit 4.1	**Recycled Content**, Specify 5% PC + PI	1
1	Credit 4.2	**Recycled Content**, Specify 10% PC + PI	1
1	Credit 5.1	**Local/Regional Materials**, 20% Manufactured Locally	1
1	Credit 5.2	**Local/Regional Materials**, of 20% Above, 50% Harvested Locally	1
	Credit 6	**Rapidly Renewable Materials**	1
	Credit 7	**Certified Wood**	1

5 Indoor Environmental Quality — Possible Points 15

Y	Prereq 1	**Minimum IAQ Performance**	
Y	Prereq 2	**Environmental Tobacco Smoke** (ETS) **Control**	
	Credit 1	**Carbon Dioxide** (CO_2) **Monitoring**	1
	Credit 2	**Ventilation Effectiveness**	1
1	Credit 3.1	**Construction IAQ Management Plan**, During Construction	1
1	Credit 3.2	**Construction IAQ Management Plan**, Before Occupancy	1
1	Credit 4.1	**Low-Emitting Materials**, Adhesives & Sealants	1
1	Credit 4.2	**Low-Emitting Materials**, Paints	1
	Credit 4.3	**Low-Emitting Materials**, Carpet	1
	Credit 4.4	**Low-Emitting Materials**, Composite Wood	1
1	Credit 5	**Indoor Chemical & Pollutant Source Control**	1
	Credit 6.1	**Controllability of Systems**, Perimeter	1
	Credit 6.2	**Controllability of Systems**, Non-Perimeter	1
	Credit 7.1	**Thermal Comfort**, Comply with ASHRAE 55-1992	1
	Credit 7.2	**Thermal Comfort**, Permanent Monitoring System	1
	Credit 8.1	**Daylight & Views**, Daylight 75% of Spaces	1
	Credit 8.2	**Daylight & Views**, Views for 90% of Spaces	1

2 Innovation & Design Process — Possible Points 5

1	Credit 1.1	**Innovation in Design**: Surpassing Local Materials (40%)	1
	Credit 1.2	**Innovation in Design**	1
	Credit 1.3	**Innovation in Design**	1
	Credit 1.4	**Innovation in Design**	1
1	Credit 2	**LEED™ Accredited Professional**	1

26 Total for "No Cost" and "Low Cost" Credits — Possible Points **69**

Certified 26-32 points **Silver** 33-38 points **Gold** 39-51 points **Platinum** 52-69 points

Note: Credits outlined in Red are considered "High Design Impact" credits.

Cost Key

- Measures that are met based on GSA standards or mandates (no premium)
- Measures with no cost premiums, or with potential cost decreases
- Measures with low cost premiums (<50K for Models from GSA LEED Cost Study)
- Measures with moderate cost premiums (between 50K - 150K for Models from GSA LEED Cost Study)
- Measures with high cost premiums (>150K for Models from GSA LEED Cost Study)
- Measures not applicable to the project
- Measures unlikely to be pursued on typical GSA projects

Step 5:

Review LEED Scorecard after "Initial Considerations" (Steps 1–4)

The number of LEED credits that can be addressed through the "Initial Considerations" steps is not insignificant. As such, upon completion of Steps 1 through 4, the project team should review the status of the LEED scorecard. It may be determined at this stage that a LEED rating is already obtainable, or that a higher rating level is within reach. Alternately, the review will indicate the additional challenges (and potential cost impacts) required to reach the desired rating level.

Example

In the "Low-Cost" Courthouse model shown in **Table 2-5**, 35 applicable points were identified through the "Initial Considerations" process—enough to achieve a Silver rating. In addition, 14 credits were categorized as "not applicable" or "unlikely." Therefore, of the 69 available LEED points, 49 were already accounted for before the "moderate" and "high-cost" credits were addressed. Of the 35 points targeted, 11 have potentially significant design impacts, and therefore require early consideration and integration by the project team.

For comparison purposes, the point totals at the "Initial Considerations" stage for the other Gold-rated models from the *GSA LEED Cost Study* were as follows:

- *"High-Cost" Courthouse:*

  22 applicable points,
  20 not applicable/unlikely

- *"Minimal Façade" Office Modernization:*

  24 applicable points,
  21 not applicable/unlikely

- *"Full Facade" Office Modernization:*

  24 applicable points,
  23 not applicable/unlikely

After this "Initial Considerations" status review, the LEED Evaluation process continues with the "Detailed Evaluations" steps (6-8). These steps review the remaining LEED credits and assist project teams in establishing the overall LEED approach and rating target for a project.

Figures 2-8 and 2-9. Department of Transportation Building, Lakewood, Colorado. (LEED Silver Rating)
Architect: Opus Architects & Engineers, Inc

Table 2-5 Summary of "Initial Considerations" Stage ("Low Cost" Courthouse Model)

35 Total for Initial Considerations — Possible Points **69**

10 Sustainable Sites — Possible Points 14

Y	Prereq 1	**Erosion & Sedimentation Control**	
1	Credit 1	**Site Selection**	1
1	Credit 2	**Development Density**	1
1	Credit 3	**Brownfield Redevelopment**	1
1	Credit 4.1	**Alternative Transportation**, Public Transportation Access	1
	Credit 4.2	**Alternative Transportation**, Bicycle Storage & Changing Rooms	1
	Credit 4.3	**Alternative Transportation**, Alternative Fuel Refueling Stations	1
	Credit 4.4	**Alternative Transportation**, Parking Capacity	1
1	Credit 5.1	**Reduced Site Disturbance**, Protect or Restore Open Space	1
1	Credit 5.2	**Reduced Site Disturbance**, Development Footprint	1
1	Credit 6.1	**Stormwater Management**, Rate and Quantity	1
	Credit 6.2	**Stormwater Management**, Treatment	1
1	Credit 7.1	**Landscape & Exterior Design to Reduce Heat Islands**, Non-Roof	1
1	Credit 7.2	**Landscape & Exterior Design to Reduce Heat Islands**, Roof	1
1	Credit 8	**Light Pollution Reduction**	1

3 Water Efficiency — Possible Points 5

1	Credit 1.1	**Water Efficient Landscaping**, Reduce by 50%	1
1	Credit 1.2	**Water Efficient Landscaping**, No Potable Use or No Irrigation	1
	Credit 2	**Innovative Wastewater Technologies**	1
1	Credit 3.1	**Water Use Reduction**, 20% Reduction	1
	Credit 3.2	**Water Use Reduction**, 30% Reduction	1

3 Energy & Atmosphere — Possible Points 17

Y	Prereq 1	**Fundamental Building Systems Commissioning**	
Y	Prereq 2	**Minimum Energy Performance**	
Y	Prereq 3	**CFC Reduction in HVAC&R Equipment**	
2	Credit 1.1	**Optimize Energy Performance**, 20% New / 10% Existing	2
	Credit 1.2	**Optimize Energy Performance**, 30% New / 20% Existing	2
	Credit 1.3	**Optimize Energy Performance**, 40% New / 30% Existing	2
	Credit 1.4	**Optimize Energy Performance**, 50% New / 40% Existing	2
	Credit 1.5	**Optimize Energy Performance**, 60% New / 50% Existing	2
	Credit 2.1	**Renewable Energy**, 5%	1
	Credit 2.2	**Renewable Energy**, 10%	1
	Credit 2.3	**Renewable Energy**, 20%	1
1	Credit 3	**Additional Commissioning**	1
	Credit 4	**Ozone Depletion**	1
	Credit 5	**Measurement & Verification**	1
	Credit 6	**Green Power**	1

6 Materials & Resources — Possible Points 13

Y	Prereq 1	**Storage & Collection of Recyclables**	
	Credit 1.1	**Building Reuse**, Maintain 75% of Existing Shell	1
	Credit 1.2	**Building Reuse**, Maintain 100% of Existing Shell	1
	Credit 1.3	**Building Reuse**, Maintain 100% Shell & 50% Non-Shell	1
1	Credit 2.1	**Construction Waste Management**, Divert 50%	1
1	Credit 2.2	**Construction Waste Management**, Divert 75%	1
	Credit 3.1	**Resource Reuse**, Specify 5%	1
	Credit 3.2	**Resource Reuse**, Specify 10%	1
1	Credit 4.1	**Recycled Content**, Specify 5% PC + PI	1
1	Credit 4.2	**Recycled Content**, Specify 10% PC + PI	1
1	Credit 5.1	**Local/Regional Materials**, 20% Manufactured Locally	1
1	Credit 5.2	**Local/Regional Materials**, of 20% Above, 50% Harvested Locally	1
	Credit 6	**Rapidly Renewable Materials**	1
	Credit 7	**Certified Wood**	1

10 Indoor Environmental Quality — Possible Points 15

Y	Prereq 1	**Minimum IAQ Performance**	
Y	Prereq 2	**Environmental Tobacco Smoke** (ETS) **Control**	
	Credit 1	**Carbon Dioxide** (CO_2) **Monitoring**	1
1	Credit 2	**Ventilation Effectiveness**	1
1	Credit 3.1	**Construction IAQ Management Plan**, During Construction	1
1	Credit 3.2	**Construction IAQ Management Plan**, Before Occupancy	1
1	Credit 4.1	**Low-Emitting Materials**, Adhesives & Sealants	1
1	Credit 4.2	**Low-Emitting Materials**, Paints	1
1	Credit 4.3	**Low-Emitting Materials**, Carpet	1
	Credit 4.4	**Low-Emitting Materials**, Composite Wood	1
1	Credit 5	**Indoor Chemical & Pollutant Source Control**	1
	Credit 6.1	**Controllability of Systems**, Perimeter	1
1	Credit 6.2	**Controllability of Systems**, Non-Perimeter	1
1	Credit 7.1	**Thermal Comfort**, Comply with ASHRAE 55-1992	1
1	Credit 7.2	**Thermal Comfort**, Permanent Monitoring System	1
	Credit 8.1	**Daylight & Views**, Daylight 75% of Spaces	1
	Credit 8.2	**Daylight & Views**, Views for 90% of Spaces	1

3 Innovation & Design Process — Possible Points 5

1	Credit 1.1	**Innovation in Design**: Dedicated Ventilation System	1
1	Credit 1.2	**Innovation in Design**: Surpassing Local Materials (40%)	1
	Credit 1.3	**Innovation in Design**	1
	Credit 1.4	**Innovation in Design**	1
1	Credit 2	**LEED™ Accredited Professional**	1

35 Total for Initial Considerations — Possible Points **69**

Certified 26-32 points **Silver** 33-38 points **Gold** 39-51 points **Platinum** 52-69 points

Note: Credits outlined in Red are considered "High Design Impact" credits.

Cost Key

- Measures that are met based on GSA standards or mandates (no premium)
- Measures with no cost premiums, or with potential cost decreases
- Measures with low cost premiums (<50K for Models from GSA LEED Cost Study)
- Measures with moderate cost premiums (between 50K - 150K for Models from GSA LEED Cost Study)
- Measures with high cost premiums (>150K for Models from GSA LEED Cost Study)
- Measures not applicable to the project
- Measures unlikely to be pursued on typical GSA projects

Step 6:

Evaluate "Moderate-Cost" and "High-Cost" Credit Options

After completing the "Initial Considerations" steps, project teams will have narrowed down the remaining LEED credits to a more manageable set of "moderate-cost" and "high–cost" credit options. Based on the results of the *GSA LEED Cost Study,* the majority of these higher-cost credits will have one or more of the following characteristics:

- They require additional space, equipment, or materials (e.g., shower rooms, carbon dioxide sensors, photovoltaic panels)
- They involve material or equipment types that are more expensive than "standard" products (e.g., certified wood, vegetated roofing systems, dimmable ballasts for lighting fixtures, high-efficiency chillers)
- They require additional labor or planning (e.g., construction IAQ management, construction waste management)
- They involve sophisticated architectural and/or mechanical design and execution (e.g., quality daylighting design integrated with photocell-based dimming of lighting fixtures)

The moderate- and high-cost credits also tend to have another common characteristic—they can provide significant benefits for the building occupants and building owner, as well as community and environmental benefits. Because both the costs and benefits are potentially high, the pursuit of credits in this category tends to require more thorough and detailed analysis. Issues to consider include the following:

- *Can the high-performance goals directly influence the major architectural, structural, MEP, civil, and landscape design strategies for the building?* By incorporating the green goals into the design parameters, an integrated design solution can be developed that erases or blurs the distinctions between "green" building strategies and the overall project design.

These integrated design solutions can meet multiple goals (programmatic, performance, aesthetic) in the most cost-effective manner. A number of the "High Design Impact" credits in LEED are summarized in step 7 of the *Guide.*

Figure 2-10. Atrium at the U.S. EPA Regional Headquarters, Kansas City, Kansas. The atrium design allows most of the office space in the building to receive natural light. The atrium's glass has a low-emissivity coating to allow visible light to enter while reflecting large percentages of the infrared spectrum, thereby controlling heat gain. (Photo: From *Off the Shelf,* Koll Development Company)

- *What potential synergies exist between various credits?* Connections among credits should be established to determine how particular design strategies can be used to achieve multiple performance goals, and earn multiple LEED credits. Items that appear costly when applied to only one credit may in fact be justifiable when applied to multiple credits. A number of "Synergistic Credits" are identified in step 7 of the Guide.
- *What level of benefit is associated with the credit or group of credits being considered?* In some cases,

the long-term or life cycle benefits of a credit or group of credits can provide clear justification for the first cost investment. Prime benefits to consider include building operational savings (energy, water, sewer, and maintenance costs), which can typically be quantified and evaluated in detail. In addition, worker productivity benefits (resulting from daylighting, views, occupant control, etc.) should be given significant consideration, particularly in the context of GSA's workplace initiatives (e.g., "The Integrated Workplace" and "Workplace 20.20" programs).

- *Has money been saved in other areas of the project that can be applied toward the moderate or high cost items?* While the cost of an individual LEED credit may be moderate or high, the overall project budget may support a number of such measures. Through integrated design solutions, trade-offs can occur between reduced project costs (e.g., reduced HVAC equipment sizes, elimination of irrigation systems, elimination of perimeter heating systems) and moderate- or high-cost green measures. Cost trade-offs can benefit from creative thinking—sometimes the most significant trade-offs occur from project-specific conditions that are not initially obvious (e.g., installing a green roof to avoid stormwater detention systems which would otherwise be required by code).

Example

In evaluating moderate and high cost LEED credits, it is important to consider the overall project goals, and the level of the LEED rating being pursued. For example, **Table 2-6** summarizes the "moderate-cost" and "high-cost" credits identified as options for the "Low-Cost" Gold-rated Courthouse model of the *GSA LEED Cost Study*. Since 35 likely credits were already identified in the "Initial Considerations" stages of the LEED evaluation process, only 6 of the 20 credit options identified are necessary to reach the Gold threshold (including 2 extra "insurance" credits). The evaluation process can therefore focus on which 6 of the 20 available points are most beneficial to the overall project, using the assessment considerations noted above and in step 7.

Figure 2-11. Exterior Light Shelves at the U.S. EPA Regional Headquarters, Kansas City, Kansas. The exterior light shelves reflect natural light upward across the interior ceilings, thereby projecting light deeper into the building. The light shelves also help to reduce glare and increase the visual comfort of the interior spaces for the building occupants. (Photo: Don Horn)

Table 2-6. "Moderate-Cost" & "High-Cost" Credit Options ("Low Cost" Courthouse Model)

20 Total for "Moderate Cost" and "High Cost" Credit Options — Possible Points **69**

2 Sustainable Sites — Possible Points 14

Y	Prereq 1	**Erosion & Sedimentation Control**	
	Credit 1	**Site Selection**	1
	Credit 2	**Development Density**	1
	Credit 3	**Brownfield Redevelopment**	1
	Credit 4.1	**Alternative Transportation**, Public Transportation Access	1
1	Credit 4.2	**Alternative Transportation**, Bicycle Storage & Changing Rooms	1
	Credit 4.3	**Alternative Transportation**, Alternative Fuel Refueling Stations	1
	Credit 4.4	**Alternative Transportation**, Parking Capacity	1
	Credit 5.1	**Reduced Site Disturbance**, Protect or Restore Open Space	1
	Credit 5.2	**Reduced Site Disturbance**, Development Footprint	1
	Credit 6.1	**Stormwater Management**, Rate and Quantity	1
1	Credit 6.2	**Stormwater Management**, Treatment	1
	Credit 7.1	**Landscape & Exterior Design to Reduce Heat Islands**, Non-Roof	1
	Credit 7.2	**Landscape & Exterior Design to Reduce Heat Islands**, Roof	1
	Credit 8	**Light Pollution Reduction**	1

1 Water Efficiency — Possible Points 5

	Credit 1.1	**Water Efficient Landscaping**, Reduce by 50%	1
	Credit 1.2	**Water Efficient Landscaping**, No Potable Use or No Irrigation	1
	Credit 2	**Innovative Wastewater Technologies**	1
	Credit 3.1	**Water Use Reduction**, 20% Reduction	1
1	Credit 3.2	**Water Use Reduction**, 30% Reduction	1

10 Energy & Atmosphere — Possible Points 17

Y	Prereq 1	**Fundamental Building Systems Commissioning**	
Y	Prereq 2	**Minimum Energy Performance**	
Y	Prereq 3	**CFC Reduction in HVAC&R Equipment**	
	Credit 1.1	**Optimize Energy Performance**, 20% New / 10% Existing	2
2	Credit 1.2	**Optimize Energy Performance**, 30% New / 20% Existing	2
2	Credit 1.3	**Optimize Energy Performance**, 40% New / 30% Existing	2
2	Credit 1.4	**Optimize Energy Performance**, 50% New / 40% Existing	2
2	Credit 1.5	**Optimize Energy Performance**, 60% New / 50% Existing	2
1	Credit 2.1	**Renewable Energy**, 5%	1
	Credit 2.2	**Renewable Energy**, 10%	1
	Credit 2.3	**Renewable Energy**, 20%	1
	Credit 3	**Additional Commissioning**	1
	Credit 4	**Ozone Depletion**	1
1	Credit 5	**Measurement & Verification**	1
	Credit 6	**Green Power**	1

1 Materials & Resources — Possible Points 13

Y	Prereq 1	**Storage & Collection of Recyclables**	
	Credit 1.1	**Building Reuse**, Maintain 75% of Existing Shell	1
	Credit 1.2	**Building Reuse**, Maintain 100% of Existing Shell	1
	Credit 1.3	**Building Reuse**, Maintain 100% Shell & 50% Non-Shell	1
	Credit 2.1	**Construction Waste Management**, Divert 50%	1
	Credit 2.2	**Construction Waste Management**, Divert 75%	1
	Credit 3.1	**Resource Reuse**, Specify 5%	1
	Credit 3.2	**Resource Reuse**, Specify 10%	1
	Credit 4.1	**Recycled Content**, Specify 5% PC + PI	1
	Credit 4.2	**Recycled Content**, Specify 10% PC + PI	1
	Credit 5.1	**Local/Regional Materials**, 20% Manufactured Locally	1
	Credit 5.2	**Local/Regional Materials**, of 20% Above, 50% Harvested Locally	1
	Credit 6	**Rapidly Renewable Materials**	1
1	Credit 7	**Certified Wood**	1

4 Indoor Environmental Quality — Possible Points 15

Y	Prereq 1	**Minimum IAQ Performance**	
Y	Prereq 2	**Environmental Tobacco Smoke** (ETS) **Control**	
1	Credit 1	**Carbon Dioxide** (CO_2) **Monitoring**	1
	Credit 2	**Ventilation Effectiveness**	1
	Credit 3.1	**Construction IAQ Management Plan**, During Construction	1
	Credit 3.2	**Construction IAQ Management Plan**, Before Occupancy	1
	Credit 4.1	**Low-Emitting Materials**, Adhesives & Sealants	1
	Credit 4.2	**Low-Emitting Materials**, Paints	1
	Credit 4.3	**Low-Emitting Materials**, Carpet	1
1	Credit 4.4	**Low-Emitting Materials**, Composite Wood	1
	Credit 5	**Indoor Chemical & Pollutant Source Control**	1
	Credit 6.1	**Controllability of Systems**, Perimeter	1
	Credit 6.2	**Controllability of Systems**, Non-Perimeter	1
	Credit 7.1	**Thermal Comfort**, Comply with ASHRAE 55-1992	1
	Credit 7.2	**Thermal Comfort**, Permanent Monitoring System	1
1	Credit 8.1	**Daylight & Views**, Daylight 75% of Spaces	1
1	Credit 8.2	**Daylight & Views**, Views for 90% of Spaces	1

2 Innovation & Design Process — Possible Points 5

1	Credit 1.1	**Innovation in Design**: Exceed Certified Wood Criteria (75%)	1
1	Credit 1.2	**Innovation in Design**: Exceed Heat Island Effect, Non-roof	1
	Credit 1.3	**Innovation in Design**	1
	Credit 1.4	**Innovation in Design**	1
	Credit 2	**LEED™ Accredited Professional**	1

20 Total for "Moderate Cost" and "High Cost" Credit Options — Possible Points **69**

Certified 26-32 points **Silver** 33-38 points **Gold** 39-51 points **Platinum** 52-69 points

Note: Credits outlined in Red are considered "High Design Impact" credits.

Cost Key

- Measures that are met based on GSA standards or mandates (no premium)
- Measures with no cost premiums, or with potential cost decreases
- Measures with low cost premiums (<50K for Models from GSA LEED Cost Study)
- Measures with moderate cost premiums (between 50K - 150K for Models from GSA LEED Cost Study)
- Measures with high cost premiums (>150K for Models from GSA LEED Cost Study)
- Measures not applicable to the project
- Measures unlikely to be pursued on typical GSA projects

Step 7:

Evaluate "High Design Impact" Credits and "Synergistic" Credits for Design Integration Opportunities

As noted in Step 6, the selection of moderate- and high-cost LEED credits typically involves detailed evaluations of the costs, benefits, and design implications. Step 7 of the LEED evaluation process focuses on the "High Design Impact" and "Synergistic" credits in a LEED project.

High Design Impact Credits:

Example

Table 2-7a summarizes the "High Design Impact" credits identified as options for the "Low-Cost" Gold-rated Courthouse model of the *GSA LEED Cost Study*. Notably, the credits were identified at various cost impact levels, ranging from no cost to high. The purpose of identifying all of the High Design Impact credits is to establish the level of influence the LEED performance goals may have on the core design approach for a project *before the design is conceptualized.* As illustrated in the Courthouse example, the design impacts of the LEED criteria can be substantial, and may include the following:

- *Site design.* A number of the LEED Sustainable Site credits (particularly the Reduced Site Disturbance and Stormwater Management credits) set criteria that can influence the amount of vegetated or impervious area on a site. This can impact site planting, site paving, and building layout decisions, as well as the basic project approach to stormwater management. Related LEED credits promote native, adaptive, and low-water use plantings (as opposed, for instance, to turf grass), which can further influence a project's approach to landscaping.
- *Building design.* LEED credits for Daylight and Views can significantly influence the building form, footprint, and façade orientations, as well as the floor-to-ceiling heights, the size and layout of the fenestration, the use of exterior or interior shading devices and light shelves, and the arrangement of interior spaces. Strategies to reduce energy use, to utilize natural ventilation, or to integrate renewable energy sources (particularly photovoltaic panels) can also significantly affect the basic building form, massing, and approach to fenestration.

Figures 2-12 and 2-13. U.S. EPA New England Regional Laboratory, Chelmsford, Massachusetts (LEED Gold Rating, Version 1.0) Reflective light tubes, with diffusers designed to fit suspended ceiling systems, and exterior light shelves bring daylight deep into the building. (Photo: Don Horn)

- *Building assemblies.* LEED credits to Optimize Energy Performance can influence a project's wall and roof construction assemblies (to minimize heat transfer and air infiltration/exfiltration), as well as a project's glazing selections. In addition, when mechanical humidification is provided to achieve the LEED Thermal Comfort credit, the building envelope must be designed to avoid condensation within the assemblies. In the Courthouse example, the use of an underfloor air distribution system (which contributes to the Ventilation Effectiveness and Controllability of Systems credits) can also influence construction assemblies, as the underfloor plenum must be designed to be airtight.
- *Mechanical systems.* In the Courthouse example, the energy efficiency goals, underfloor air delivery system, and dedicated ventilation system all significantly influence the project approach to HVAC design.

Application to GSA Projects

A number of other major design decisions can be impacted by LEED credit criteria, depending on the specific project and LEED credits under consideration. However, as indicated by the examples in the *GSA LEED Cost Study*, the "High Design Impact" credits in a GSA project will typically be limited to a manageable group. It is important for design teams to establish what these credits are—and their real implications—prior to formulating their design approach.

Credit Synergies:

When reviewing the potential "High Design Impact" credits on a project, it is important that the various design considerations be evaluated in tandem. In some cases the credits will be "synergistic," meaning that strategies or technologies used to achieve one credit can also be used to achieve additional credits. By evaluating the range of credit synergies within a project, an integrated design solution can be formulated to achieve multiple goals (and earn multiple credits) within a comprehensive and justifiable design approach.

Figure 2-14. Green Roof of National Oceanic and Atmospheric Administration, Suitland, Maryland.
Vegetated, or green, roofs can contribute to the reduction of heat islands (LEED Sustainable Site Credit 7.2: Heat Island Reduction – Roof) as well as the reduction of stormwater runoff (LEED Sustainable Site Credit 6.1: Stormwater Management – Rate and Quantity)
Architect: Morphosis (Rendering: Morphosis)

Example

Table 2-7b summarizes the "Synergistic" credit options identified for both the "Low-Cost" and "High-Cost" Gold-rated Courthouse models of the *GSA LEED Cost Study*. As with the "High Design Impact" credits, the synergistic credits were identified at various cost impact levels, ranging from no cost to high. As the table also indicates, credit synergies are not limited to only High Design Impact credits; synergies may also be identified among credits that primarily involve material or equipment selections. Detailed descriptions of credit synergies for the Courthouse models, including the cost implications, can be found in the *GSA LEED Cost Study*.

Table 2-7a. Summary of "High Design Impact" Credits ("Low Cost" Courthouse Model)

20 Total for "High Design Impact" Credits — Possible Points **69**

3 Sustainable Sites — Possible Points 14

	Prereq 1	**Erosion & Sedimentation Control**	
	Credit 1	**Site Selection**	1
	Credit 2	**Development Density**	1
	Credit 3	**Brownfield Redevelopment**	1
	Credit 4.1	**Alternative Transportation**, Public Transportation Access	1
	Credit 4.2	**Alternative Transportation**, Bicycle Storage & Changing Rooms	1
	Credit 4.3	**Alternative Transportation**, Alternative Fuel Refueling Stations	1
	Credit 4.4	**Alternative Transportation**, Parking Capacity	1
1	Credit 5.1	**Reduced Site Disturbance**, Protect or Restore Open Space	1
1	Credit 5.2	**Reduced Site Disturbance**, Development Footprint	1
1	Credit 6.1	**Stormwater Management**, Rate and Quantity	1
	Credit 6.2	**Stormwater Management**, Treatment	1
	Credit 7.1	**Landscape & Exterior Design to Reduce Heat Islands**, Non-Roof	1
	Credit 7.2	**Landscape & Exterior Design to Reduce Heat Islands**, Roof	1
	Credit 8	**Light Pollution Reduction**	1

2 Water Efficiency — Possible Points 5

1	Credit 1.1	**Water Efficient Landscaping**, Reduce by 50%	1
1	Credit 1.2	**Water Efficient Landscaping**, No Potable Use or No Irrigation	1
	Credit 2	**Innovative Wastewater Technologies**	1
	Credit 3.1	**Water Use Reduction**, 20% Reduction	1
	Credit 3.2	**Water Use Reduction**, 30% Reduction	1

9 Energy & Atmosphere — Possible Points 17

	Prereq 1	**Fundamental Building Systems Commissioning**	
	Prereq 2	**Minimum Energy Performance**	
	Prereq 3	**CFC Reduction in HVAC&R Equipment**	
	Credit 1.1	**Optimize Energy Performance**, 20% New / 10% Existing	2
2	Credit 1.2	**Optimize Energy Performance**, 30% New / 20% Existing	2
2	Credit 1.3	**Optimize Energy Performance**, 40% New / 30% Existing	2
2	Credit 1.4	**Optimize Energy Performance**, 50% New / 40% Existing	2
2	Credit 1.5	**Optimize Energy Performance**, 60% New / 50% Existing	2
1	Credit 2.1	**Renewable Energy**, 5%	1
	Credit 2.2	**Renewable Energy**, 10%	1
	Credit 2.3	**Renewable Energy**, 20%	1
	Credit 3	**Additional Commissioning**	1
	Credit 4	**Ozone Depletion**	1
	Credit 5	**Measurement & Verification**	1
	Credit 6	**Green Power**	1

Materials & Resources — Possible Points 13

	Prereq 1	**Storage & Collection of Recyclables**	
	Credit 1.1	**Building Reuse**, Maintain 75% of Existing Shell	1
	Credit 1.2	**Building Reuse**, Maintain 100% of Existing Shell	1
	Credit 1.3	**Building Reuse**, Maintain 100% Shell & 50% Non-Shell	1
	Credit 2.1	**Construction Waste Management**, Divert 50%	1
	Credit 2.2	**Construction Waste Management**, Divert 75%	1
	Credit 3.1	**Resource Reuse**, Specify 5%	1
	Credit 3.2	**Resource Reuse**, Specify 10%	1
	Credit 4.1	**Recycled Content**, Specify 5% PC + PI	1
	Credit 4.2	**Recycled Content**, Specify 10% PC + PI	1
	Credit 5.1	**Local/Regional Materials**, 20% Manufactured Locally	1
	Credit 5.2	**Local/Regional Materials**, of 20% Above, 50% Harvested Locally	1
	Credit 6	**Rapidly Renewable Materials**	1
	Credit 7	**Certified Wood**	1

5 Indoor Environmental Quality — Possible Points 15

	Prereq 1	**Minimum IAQ Performance**	
	Prereq 2	**Environmental Tobacco Smoke** (ETS) **Control**	
	Credit 1	**Carbon Dioxide** (CO_2) **Monitoring**	1
1	Credit 2	**Ventilation Effectiveness**	1
	Credit 3.1	**Construction IAQ Management Plan**, During Construction	1
	Credit 3.2	**Construction IAQ Management Plan**, Before Occupancy	1
	Credit 4.1	**Low-Emitting Materials**, Adhesives & Sealants	1
	Credit 4.2	**Low-Emitting Materials**, Paints	1
	Credit 4.3	**Low-Emitting Materials**, Carpet	1
	Credit 4.4	**Low-Emitting Materials**, Composite Wood	1
	Credit 5	**Indoor Chemical & Pollutant Source Control**	1
	Credit 6.1	**Controllability of Systems**, Perimeter	1
1	Credit 6.2	**Controllability of Systems**, Non-Perimeter	1
1	Credit 7.1	**Thermal Comfort**, Comply with ASHRAE 55-1992	1
	Credit 7.2	**Thermal Comfort**, Permanent Monitoring System	1
1	Credit 8.1	**Daylight & Views**, Daylight 75% of Spaces	1
1	Credit 8.2	**Daylight & Views**, Views for 90% of Spaces	1

1 Innovation & Design Process — Possible Points 5

1	Credit 1.1	**Innovation in Design**: Dedicated Ventilation System	1
	Credit 1.2	**Innovation in Design**	1
	Credit 1.3	**Innovation in Design**	1
	Credit 1.4	**Innovation in Design**	1
	Credit 2	**LEED™ Accredited Professional**	1

20 Total for "High Design Impact" Credits — Possible Points **69**

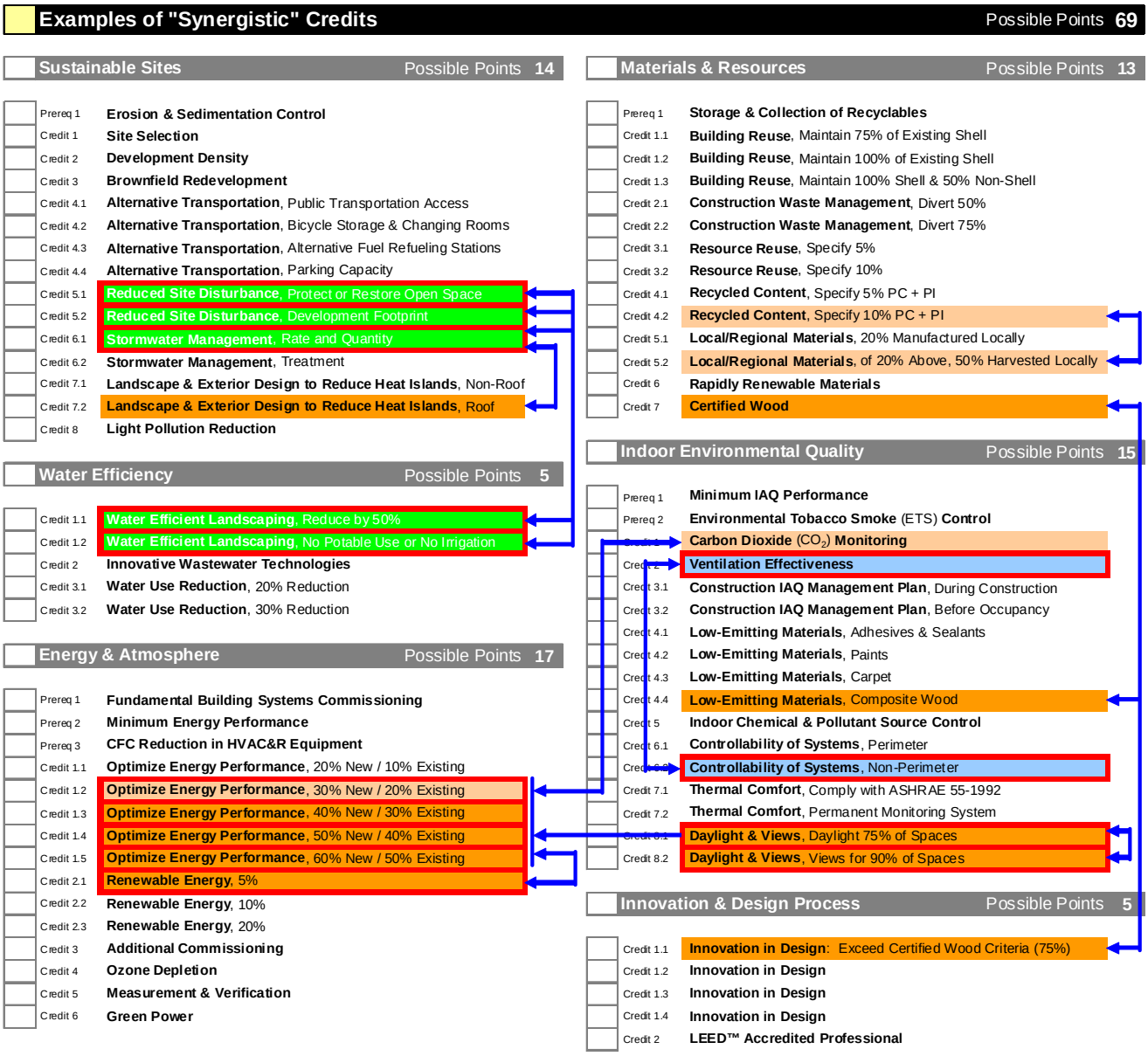
Certified 26-32 points **Silver** 33-38 points **Gold** 39-51 points **Platinum** 52-69 points

Note: Credits outlined in Red are "High Design Impact" credits

Cost Key

- Measures that are met based on GSA standards or mandates (no premium)
- Measures with no cost premiums, or with potential cost decreases
- Measures with low cost premiums (<50K for Models from GSA LEED Cost Study)
- Measures with moderate cost premiums (between 50K - 150K for Models from GSA LEED Cost Study)
- Measures with high cost premiums (>150K for Models from GSA LEED Cost Study)
- Measures not applicable to the project
- Measures unlikely to be pursued on typical GSA projects

Table 2-7b. Examples of "Synergistic" Credit Options (Courthouse Models)



Note: Credits outlined in Red are considered "high design impact" credits. Blue arrows indicate "synergistic" credits.

Cost Key

- Measures that are met based on GSA standards or mandates (no premium)
- Measures with no cost premiums, or with potential cost decreases
- Measures with low cost premiums (<50K for Models from GSA LEED Cost Study)
- Measures with moderate cost premiums (between 50K - 150K for Models from GSA LEED Cost Study)
- Measures with high cost premiums (>150K for Models from GSA LEED Cost Study)
- Measures not applicable to the project
- Measures unlikely to be pursued on typical GSA projects

Step 8:

Establish Initial LEED Approach for the Project

The preceding seven steps in the LEED Evaluation Process were designed to assist project teams in establishing reasonable LEED targets for GSA projects, based on a cost-justified approach. After establishing the "low-hanging fruit" from the "Initial Considerations" steps, then evaluating and adding additional moderate- or high-cost credits through the "Detailed Evaluations" steps, project teams should have a clear understanding of their targeted LEED credits (and the attended project implications), as well as a defensible justification for the LEED rating level being pursued.

Example

Table 2-8 summarizes the Initial LEED Targets established for the "Low-Cost" Gold-rated Courthouse model of the *GSA LEED Cost Study*. The final tally includes:

- All 7 Prerequisites;
- 9 "GSA Standard" credits (no cost premium);
- 23 "No Cost" credits;
- 3 "Low Cost" credits;
- 3 "Moderate Cost" credits; and
- 3 "High Cost" credits.

As established through the *Cost Study*, the estimated cost premium for achieving the LEED Gold rating is $2.97/GSF, a 1.4 percent cost increase.

Application to GSA Projects

While other projects may have higher cost impacts, and/or may target a lower LEED rating, the "Low-Cost" Courthouse model demonstrates how the LEED Evaluation Process can be used to set initial green building goals, and achieve a high level of building performance within the programmatic and cost parameters of a GSA project. If approached in this manner, GSA's LEED rating requirement will achieve its intended goal—to integrate building quality and performance with environmental responsibility and long-term fiscal prudence.

Table 2-8. Summary of Initial LEED Targets ("Low Cost" Courthouse Model)

41 Project Total — Possible Points **69**

10 Sustainable Sites — Possible Points 14

Y	Prereq 1	**Erosion & Sedimentation Control**	
1	Credit 1	**Site Selection**	1
1	Credit 2	**Development Density**	1
1	Credit 3	**Brownfield Redevelopment**	1
1	Credit 4.1	**Alternative Transportation**, Public Transportation Access	1
	Credit 4.2	**Alternative Transportation**, Bicycle Storage & Changing Rooms	1
	Credit 4.3	**Alternative Transportation**, Alternative Fuel Refueling Stations	1
	Credit 4.4	**Alternative Transportation**, Parking Capacity	1
1	Credit 5.1	**Reduced Site Disturbance**, Protect or Restore Open Space	1
1	Credit 5.2	**Reduced Site Disturbance**, Development Footprint	1
1	Credit 6.1	**Stormwater Management**, Rate and Quantity	1
	Credit 6.2	**Stormwater Management**, Treatment	1
1	Credit 7.1	**Landscape & Exterior Design to Reduce Heat Islands**, Non-Roof	1
1	Credit 7.2	**Landscape & Exterior Design to Reduce Heat Islands**, Roof	1
1	Credit 8	**Light Pollution Reduction**	1

4 Water Efficiency — Possible Points 5

1	Credit 1.1	**Water Efficient Landscaping**, Reduce by 50%	1
1	Credit 1.2	**Water Efficient Landscaping**, No Potable Use or No Irrigation	1
	Credit 2	**Innovative Wastewater Technologies**	1
1	Credit 3.1	**Water Use Reduction**, 20% Reduction	1
1	Credit 3.2	**Water Use Reduction**, 30% Reduction	1

7 Energy & Atmosphere — Possible Points 17

Y	Prereq 1	**Fundamental Building Systems Commissioning**	
Y	Prereq 2	**Minimum Energy Performance**	
Y	Prereq 3	**CFC Reduction in HVAC&R Equipment**	
2	Credit 1.1	**Optimize Energy Performance**, 20% New / 10% Existing	2
2	Credit 1.2	**Optimize Energy Performance**, 30% New / 20% Existing	2
1	Credit 1.3	**Optimize Energy Performance**, 40% New / 30% Existing	2
	Credit 1.4	**Optimize Energy Performance**, 50% New / 40% Existing	2
	Credit 1.5	**Optimize Energy Performance**, 60% New / 50% Existing	2
	Credit 2.1	**Renewable Energy**, 5%	1
	Credit 2.2	**Renewable Energy**, 10%	1
	Credit 2.3	**Renewable Energy**, 20%	1
1	Credit 3	**Additional Commissioning**	1
	Credit 4	**Ozone Depletion**	1
1	Credit 5	**Measurement & Verification**	1
	Credit 6	**Green Power**	1

6 Materials & Resources — Possible Points 13

Y	Prereq 1	**Storage & Collection of Recyclables**	
	Credit 1.1	**Building Reuse**, Maintain 75% of Existing Shell	1
	Credit 1.2	**Building Reuse**, Maintain 100% of Existing Shell	1
	Credit 1.3	**Building Reuse**, Maintain 100% Shell & 50% Non-Shell	1
1	Credit 2.1	**Construction Waste Management**, Divert 50%	1
1	Credit 2.2	**Construction Waste Management**, Divert 75%	1
	Credit 3.1	**Resource Reuse**, Specify 5%	1
	Credit 3.2	**Resource Reuse**, Specify 10%	1
1	Credit 4.1	**Recycled Content**, Specify 5% PC + PI	1
1	Credit 4.2	**Recycled Content**, Specify 10% PC + PI	1
1	Credit 5.1	**Local/Regional Materials**, 20% Manufactured Locally	1
1	Credit 5.2	**Local/Regional Materials**, of 20% Above, 50% Harvested Locally	1
	Credit 6	**Rapidly Renewable Materials**	1
	Credit 7	**Certified Wood**	1

11 Indoor Environmental Quality — Possible Points 15

Y	Prereq 1	**Minimum IAQ Performance**	
Y	Prereq 2	**Environmental Tobacco Smoke** (ETS) **Control**	
1	Credit 1	**Carbon Dioxide** (CO_2) **Monitoring**	1
1	Credit 2	**Ventilation Effectiveness**	1
1	Credit 3.1	**Construction IAQ Management Plan**, During Construction	1
1	Credit 3.2	**Construction IAQ Management Plan**, Before Occupancy	1
1	Credit 4.1	**Low-Emitting Materials**, Adhesives & Sealants	1
1	Credit 4.2	**Low-Emitting Materials**, Paints	1
1	Credit 4.3	**Low-Emitting Materials**, Carpet	1
	Credit 4.4	**Low-Emitting Materials**, Composite Wood	1
1	Credit 5	**Indoor Chemical & Pollutant Source Control**	1
	Credit 6.1	**Controllability of Systems**, Perimeter	1
1	Credit 6.2	**Controllability of Systems**, Non-Perimeter	1
1	Credit 7.1	**Thermal Comfort**, Comply with ASHRAE 55-1992	1
1	Credit 7.2	**Thermal Comfort**, Permanent Monitoring System	1
	Credit 8.1	**Daylight & Views**, Daylight 75% of Spaces	1
	Credit 8.2	**Daylight & Views**, Views for 90% of Spaces	1

3 Innovation & Design Process — Possible Points 5

1	Credit 1.1	**Innovation in Design**: Dedicated Ventilation System	1
1	Credit 1.2	**Innovation in Design**: Surpassing Local Materials (40%)	1
	Credit 1.3	**Innovation in Design**	1
	Credit 1.4	**Innovation in Design**	1
1	Credit 2	**LEED™ Accredited Professional**	1

41 Project Total — Possible Points **69**

Certified 26-32 points **Silver** 33-38 points **Gold** 39-51 points **Platinum** 52-69 points

Note: Credits outlined in Red are considered "high design impact" credits.

Cost Key

- Measures that are met based on GSA standards or mandates (no premium)
- Measures with no cost premiums, or with potential cost decreases
- Measures with low cost premiums (<50K for Models from GSA LEED Cost Study)
- Measures with moderate cost premiums (between 50K - 150K for Models from GSA LEED Cost Study)
- Measures with high cost premiums (>150K for Models from GSA LEED Cost Study)
- Measures not applicable to the project
- Measures unlikely to be pursued on typical GSA projects

Appendix A:

LEED Scorecard for Evaluating GSA Projects

The following LEED Version 2.1 scorecard is provided for use by GSA project teams in developing and evaluating their project's LEED approach. By engaging the LEED evaluation process early—during the programming and design concepts phases—project teams have the greatest opportunity to pursue integrated design solutions that can deliver life-cycle cost-effective, environmentally responsible, high-performance buildings.

LEED Version 2.1 Scorecard — Possible Points 69

Sustainable Sites — Possible Points 14

Prereq 1	**Erosion & Sedimentation Control**	Y
Credit 1	**Site Selection**	1
Credit 2	**Development Density**	1
Credit 3	**Brownfield Redevelopment**	1
Credit 4.1	**Alternative Transportation**, Public Transportation Access	1
Credit 4.2	**Alternative Transportation**, Bicycle Storage & Changing Rooms	1
Credit 4.3	**Alternative Transportation**, Alternative Fuel Refueling Stations	1
Credit 4.4	**Alternative Transportation**, Parking Capacity	1
Credit 5.1	**Reduced Site Disturbance**, Protect or Restore Open Space	1
Credit 5.2	**Reduced Site Disturbance**, Development Footprint	1
Credit 6.1	**Stormwater Management**, Rate and Quantity	1
Credit 6.2	**Stormwater Management**, Treatment	1
Credit 7.1	**Landscape & Exterior Design to Reduce Heat Islands**, Non-Roof	1
Credit 7.2	**Landscape & Exterior Design to Reduce Heat Islands**, Roof	1
Credit 8	**Light Pollution Reduction**	1

Water Efficiency — Possible Points 5

Credit 1.1	**Water Efficient Landscaping**, Reduce by 50%	1
Credit 1.2	**Water Efficient Landscaping**, No Potable Use or No Irrigation	1
Credit 2	**Innovative Wastewater Technologies**	1
Credit 3.1	**Water Use Reduction**, 20% Reduction	1
Credit 3.2	**Water Use Reduction**, 30% Reduction	1

Energy & Atmosphere — Possible Points 17

Prereq 1	**Fundamental Building Systems Commissioning**	Y
Prereq 2	**Minimum Energy Performance**	Y
Prereq 3	**CFC Reduction in HVAC&R Equipment**	Y
Credit 1.1	**Optimize Energy Performance**, 20% New / 10% Existing	2
Credit 1.2	**Optimize Energy Performance**, 30% New / 20% Existing	2
Credit 1.3	**Optimize Energy Performance**, 40% New / 30% Existing	2
Credit 1.4	**Optimize Energy Performance**, 50% New / 40% Existing	2
Credit 1.5	**Optimize Energy Performance**, 60% New / 50% Existing	2
Credit 2.1	**Renewable Energy**, 5%	1
Credit 2.2	**Renewable Energy**, 10%	1
Credit 2.3	**Renewable Energy**, 20%	1
Credit 3	**Additional Commissioning**	1
Credit 4	**Ozone Depletion**	1
Credit 5	**Measurement & Verification**	1
Credit 6	**Green Power**	1

Materials & Resources — Possible Points 13

Prereq 1	**Storage & Collection of Recyclables**	Y
Credit 1.1	**Building Reuse**, Maintain 75% of Existing Shell	1
Credit 1.2	**Building Reuse**, Maintain 100% of Existing Shell	1
Credit 1.3	**Building Reuse**, Maintain 100% Shell & 50% Non-Shell	1
Credit 2.1	**Construction Waste Management**, Divert 50%	1
Credit 2.2	**Construction Waste Management**, Divert 75%	1
Credit 3.1	**Resource Reuse**, Specify 5%	1
Credit 3.2	**Resource Reuse**, Specify 10%	1
Credit 4.1	**Recycled Content**, Specify 5% PC + PI	1
Credit 4.2	**Recycled Content**, Specify 10% PC + PI	1
Credit 5.1	**Local/Regional Materials**, 20% Manufactured Locally	1
Credit 5.2	**Local/Regional Materials**, of 20% Above, 50% Harvested Locally	1
Credit 6	**Rapidly Renewable Materials**	1
Credit 7	**Certified Wood**	1

Indoor Environmental Quality — Possible Points 15

Prereq 1	**Minimum IAQ Performance**	Y
Prereq 2	**Environmental Tobacco Smoke** (ETS) **Control**	Y
Credit 1	**Carbon Dioxide** (CO_2) **Monitoring**	1
Credit 2	**Ventilation Effectiveness**	1
Credit 3.1	**Construction IAQ Management Plan**, During Construction	1
Credit 3.2	**Construction IAQ Management Plan**, Before Occupancy	1
Credit 4.1	**Low-Emitting Materials**, Adhesives & Sealants	1
Credit 4.2	**Low-Emitting Materials**, Paints	1
Credit 4.3	**Low-Emitting Materials**, Carpet	1
Credit 4.4	**Low-Emitting Materials**, Composite Wood	1
Credit 5	**Indoor Chemical & Pollutant Source Control**	1
Credit 6.1	**Controllability of Systems**, Perimeter	1
Credit 6.2	**Controllability of Systems**, Non-Perimeter	1
Credit 7.1	**Thermal Comfort**, Comply with ASHRAE 55-1992	1
Credit 7.2	**Thermal Comfort**, Permanent Monitoring System	1
Credit 8.1	**Daylight & Views**, Daylight 75% of Spaces	1
Credit 8.2	**Daylight & Views**, Views for 90% of Spaces	1

Innovation & Design Process — Possible Points 5

Credit 1.1	**Innovation in Design**	1
Credit 1.2	**Innovation in Design**	1
Credit 1.3	**Innovation in Design**	1
Credit 1.4	**Innovation in Design**	1
Credit 2	**LEED™ Accredited Professional**	1

Project Total — Possible Points 69

Certified 26-32 points **Silver** 33-38 points **Gold** 39-51 points **Platinum** 52-69 points

Appendix B:

Resources

Organizations, Programs, and Services

U.S. General Services Administration (GSA), Public Buildings Service, Sustainable Design Program

www.gsa.gov/sustainabledesign

GSA is committed to incorporating principles of sustainable design and energy efficiency into all of its building projects. The result is an optimal balance of cost, environmental, societal, and human benefits while meeting the mission and function of the intended facility. GSA's Sustainable Design Program, through its regional Build Green Coordinators, provides technical assistance and support to GSA project teams for integrating sustainable design as seamlessly as possible into the existing design and construction process.

U.S. General Services Administration (GSA), Office of Real Property - Sustainable Development Program

www.gsa.gov/sustainabledevelopment

The Office of Real Property, Sustainable Development Program provides access to tools, publications, presentations, and videos developed by GSA to assist agencies in transforming the way they do business.

U.S. General Services Administration (GSA), Office of Real Property, Integrated Workplace Program

www.gsa.gov/Portal/gsa/ep/channelView.do?pageTypeId=8203&channelPage=%2Fep%2Fchannel%2FgsaOverview.jsp&channelId=-13190

The Integrated Workplace (IW) Program supports GSA's strategic goal to "maintain a world-class workforce and world-class workplace," and provides agencies with information and resources that assist them in developing high-performance workplaces that meet their business needs, are best suited to their employees work functions, and can be readily adapted to accommodate new work practices and strategies with a minimum of expense and delay. The IW website includes access to several GSA publications on the integrated workplace concept, as well as several IW case studies.

U.S. General Services Administration (GSA) Federal Supply Service (FSS)

www.gsa.gov/fss

GSA facilitates the federal acquisition of environmental products and services through the Federal Supply Service.

U.S. Green Building Council (USGBC)

www.usgbc.org

The USGBC consists of a coalition of leaders from across the building industry working to promote buildings that are environmentally responsible, profitable, and healthful places to live and work. USGBC and its members developed the Leadership in Energy and Environmental Design (LEED) Green Building Rating System® as a national consensus-based, market-driven building rating system designed to accelerate the development and implementation of green building practices.

Publications and Websites

U.S. General Services Administration (GSA) LEED® Cost Study, 2004

Available: www.wbdg.org/references/ccbdoc.php?i=280

This major study for GSA defines costs associated with the LEED ratings. Two building types (new construction courthouse and Federal Building modernization) are modeled against two scenarios for each LEED rating (Certification, Silver, Gold), identifying differential costs of construction, design, and documentation/submission requirements.

U.S. General Services Administration (GSA) Facilities Standards for the Public Buildings Service, P100-2003

Available: www.wbdg.org/references/ccbdoc.php?i=275&r=1

The *Facilities Standards for the Public Buildings Service* establishes design standards and criteria for new buildings, major and minor alterations, and work in historic structures for the Public Buildings Service of GSA. This document contains policy and technical criteria to be used in the programming, design, and documentation of GSA buildings.

Leadership in Energy and Environmental Design (LEED) Green Building Rating System®

Available: www.leedbuilding.org

LEED is a voluntary, consensus-based national standard for developing sustainable buildings. LEED® consists of a set of prerequisites and credits that define specific and measurable "green" building criteria. By complying with the prerequisites and a specified number of the available credits, projects can achieve certification as a LEED® Green Building. In GSA building projects, LEED is being used as both a set of criteria and as a measurement tool. As of FY 2000 all new GSA building projects must meet the criteria for basic LEED® certification.

Leadership in Energy and Environmental Design (LEED) Green Building Rating System® Reference Guide for New Construction & Major Renovations

Available: www.leedbuilding.org

A sustainable design guide and user manual for the LEED Green Building Rating System. The *Reference Guide* is a 328-page manual that provides detailed information, resources and standards for the credits covered in LEED. It is intended to help aspiring projects understand the benefits of compliance and apply the criteria.

U.S. Courts Design Guide, 4th Edition

Available: www.wbdg.org/references/ccbdoc.php?i=65&r=1

The *U.S. Courts Design Guide* has been prepared for judges, architects, engineers, and court administrators who will be involved in federal court construction projects. It addresses facilities-related problems caused by heightened security needs, automation of legal processes, and significant caseload increases as well as accommodates the dynamics and complexities of the modern courthouse, and meets demands for high levels of performance.

Design Excellence Program Guide

Available: www.wbdg.org/references/ccbdoc.php?i=277&r=1

The *Design Excellence Program Guide* clarifies critical elements of the Design Excellence Program and enables GSA officials and staff, GSA clients, architectural/engineering firms hired by GSA, and GSA's private-sector peer professionals to become partners in design excellence and creators of an architectural legacy that all Americans can point to with pride. Use of the *Guide* will help ensure the fairness and integrity of the Design Excellence process and establish the high level of professionalism and respect required among parties to carry a project to a successful and rewarding conclusion. Sustainable Design is one of the evaluation factors for selecting architectural/engineering firms.

Project Planning Guide

Available:
www.gsa.gov/Portal/gsa/ep/programView.do?pageTypeId=8195&ooid=8149&programPage=%2Fep%2Fprogram%2FgsaDocument.jsp&programId=8307&channelId=-12893

The *Project Planning Guide* was created to assist all of those who develop GSA's Capital Program in evaluating, developing, and implementing federal facilities projects. For GSA staff about to embark on a Feasibility Study or Program Development Study (PDS), this *Guide* outlines the project delivery process and keys to success. For other participants in a Feasibility Study or PDS effort, this *Guide* provides information on how they can support the process, as a team member, expert resource, or intended user of the final product.

Whole Building Design Guide (WBDG)

Available: www.wbdg.org

The Whole Building Design Guide (WBDG) is the only knowledge-based Web portal designed to provide government and industry practitioners with one-stop access to up-to-date information on a wide range of federal construction criteria, guidance, and technology from an integrated, or "whole building," perspective. Through dynamic Web technology, the WBDG provides users—design professionals and project managers—an overview of the various topics, concepts, and best practices associated with good whole building design, and then provides a ready means of accessing commercial and government guides, standards, and criteria needed to create such designs. The WBDG contains an entire design objective branch with a number of resource pages related to sustainability and the LEED® Green Building Rating System.

GreenerBuildings

Available: www.greenerbuildings.com

GreenerBuildings.com is a resource for environmentally responsible building development. It is a resource to help companies of all sizes and sectors understand and address building design, construction, and operation in a way that aligns environmental responsibility with business success. Users can view information by topic areas or by LEED® categories.

Appendix C:

Summary of LEED Scorecards for Recent GSA Projects

The following table shows the LEED credits pursued or being pursued for a number of recent GSA building projects.

U.S. GENERAL SERVICES ADMINISTRATION LEED PROJECT CHECKLISTS	COURTHOUSE, YOUNGSTOWN - FINAL	SSA RENOVATION, WOODLAWN- FINAL	SSA CHILD CARE, WOODLAWN- FINAL	EPA TECH CTR, KANSAS CITY	MLK, ATLANTA	MOORHEAD, PITSBURGH	COURTHOUSE, LITTLE ROCK	FED BLDG, SAN FRANCISCO	ATF HQ, WASHINGTON, DC	PTO, ALEXANDRIA	EPA LAB, CHELMSFORD - V1.0	OKC FED CAMPUS, OKC - V1.0	TALLY (Y/TOTAL)
Sustainable Sites													
Credit 1 Site Selection	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			10/12
Credit 2 Urban Redevelopment	Y	?	N	N	?	Y	Y	Y	Y	Y	N	Y	7/12
Credit 3 Brownfield Redevelopment	Y	N	N	Y	N	N	?	Y	Y	Y	Y	Y	7/12
Credit 4.1 Alternative Transportation, Public Transportation Access	Y	Y	Y	Y	Y	Y	?	Y	Y	Y	N	Y	10/12
Credit 4.2 Alternative Transportation, Bicycle Storage & Changing Rooms	N	Y	N	Y	Y	N	?	?	Y	?	Y	Y	6/12
Credit 4.3 Alternative Transportation, Alternative Fuel Refueling Stations	N	N	N	?	?	N	N	?	N	N	Y	N	1/12
Credit 4.4 Alternative Transportation, Parking Capacity	?	Y	N	?	Y	Y	?	Y	Y	N	Y	Y	7/12
Credit 5.1 Reduced Site Disturbance, Protect or Restore Open Space	Y	N	Y	Y	?	N	Y	Y	Y	?	Y	Y	8/12
Credit 5.2 Reduced Site Disturbance, Development Footprint	Y	N	Y	Y	N	N	Y	?	Y	N	Y	Y	7/12
Credit 6.1 Stormwater Management, Rate or Quantity	Y	N	Y	?	?	N	Y	Y	Y	N	N	Y	6/12
Credit 6.2 Stormwater Management, Treatment	N	N	N	N	N	N	N	Y	Y	?	Y		3/12
Credit 7.1 Landscape & Exterior Design to Reduce Heat Islands, NonRoof	Y	N	N	Y	Y	N	Y	Y	Y	Y		Y	8/12
Credit 7.2 Landscape & Exterior Design to Reduce Heat Islands, Roof	Y	?	?	Y	?	N	Y	Y	Y	N	N	Y	6/12
Credit 8 Light Pollution Reduction	Y	?	Y	?	Y	Y	?	Y	N	?			5/12
Water Efficiency													
Credit 1.1 Water Efficient Landscaping, Reduce by 50%	Y	Y	Y	Y	Y	N	Y	Y	Y	?	Y		9/12
Credit 1.2 Water Efficient Landscaping, No Potable Use or No Irrigation	Y	Y	Y	Y	N	N	N	?	?	N	Y		5/12
Credit 2 Innovative Wastewater Technologies	N	N	N	?	N	N	N	N	N	N	N	N	0/12
Credit 3.1 Water Use Reduction, 20% Reduction	N	N	N	?	?	Y	N	Y	?	N	Y	Y	4/12
Credit 3.2 Water Use Reduction, 30% Reduction	N	N	N	N	?	N	N	Y	?	N			1/12
Energy & Atmosphere													
Credit 1.1 Optimize Energy Performance, 20% New / 10% Existing	N	Y	Y	?	Y	Y	Y	Y	Y	?	Y	Y	9/12
Credit 1.1 Optimize Energy Performance, 20% New / 10% Existing	N	Y	Y	?	Y	Y	Y	Y	Y	?	Y	Y	9/12
Credit 1.2 Optimize Energy Performance, 30% New / 20% Existing	N	Y	Y	?	?	?	?	Y	?	N	Y	Y	5/12
Credit 1.2 Optimize Energy Performance, 30% New / 20% Existing	N	Y	Y	?	?	?	?	Y	?	N	Y	Y	5/12
Credit 1.3 Optimize Energy Performance, 40% New / 30% Existing	N	Y	Y	?	N	N	N	Y	?	N	N	N	3/12
Credit 1.3 Optimize Energy Performance, 40% New / 30% Existing	N	N	N	?	N	N	N	Y	?	N	N	N	1/12
Credit 1.4 Optimize Energy Performance, 50% New / 40% Existing	N	N	N	?	N	N	N	Y	N	N	N	N	1/12
Credit 1.4 Optimize Energy Performance, 50% New / 40% Existing	N	N	N		N	N	N	Y	N	N	N	N	1/12
Credit 1.5 Optimize Energy Performance, 60% New / 50% Existing	N	N	N	N	N	N	N	Y	N	N	N	N	1/12
Credit 1.5 Optimize Energy Performance, 60% New / 50% Existing	N	N	N	N	N	N	N	Y	N	N	N	N	1/12
Credit 2.1 Renewable Energy, 5%	N	N	N	N	N	N	N	Y	?	N		N	1/12
Credit 2.2 Renewable Energy, 10%	N	N	N	N	N	N	N	Y	N	N	N	N	1/12
Credit 2.3 Renewable Energy, 20%	N	N	N	N	N	N	N	Y	N	N	N	N	1/12
Credit 3 Additional Commissioning	N	Y	?	Y	Y	Y	?	Y	?	N		N	5/12
Credit 4 Ozone Depletion	Y	Y	N	?	Y	?	Y	Y	?	?	?	Y	6/12
Credit 5 Measurement & Verification	N	Y	N	N	?	Y	Y	Y	Y	?	Y	Y	7/12
Credit 6 Green Power	N	N	N	N	N	?	N	?	?	N	Y		1/12
Materials & Resources													
Credit 1.1 Building Reuse, Maintain 75% of Existing Shell	N	Y	N	N	Y	Y	y	N	Y	N	N	N	5/12
Credit 1.2 Building Reuse, Maintain 100% of Shell	N	N	N	N	Y	Y	Y	N	N	N	N	N	3/12
Credit 1.3 Building Reuse, Maintain 100% of Shell & 50% Non-Shell	N	N	N	N	N	N	N	N	N	N	N	N	0/12
Credit 2.1 Construction Waste Management, Divert 50%	Y	Y	Y	?	?	Y	N	?	N	?	Y	Y	6/12
Credit 2.2 Construction Waste Management, Divert 75%	N	Y	Y	?	?	N	N	N	Y	N	?		3/12
Credit 3.1 Resource Reuse, Specify 5%	N	N	N	N	N	Y	?	N	?	N	N		1/12
Credit 3.2 Resource Reuse, Specify 10%	N	N	N	N	N	N	N	N	?	N	N		0/12
Credit 4.1 Recycled Content, Specify 25%	Y	N	Y	?	Y	Y	?	Y	?	?	Y	Y	7/12
Credit 4.2 Recycled Content, Specify 50%	Y	N	Y	?	?	?	N	?	?	N	N		2/12
Credit 5.1 Local/Regional Materials, 20% Manufactured Locally	Y	Y	Y	Y	Y	Y	N	N	?	?	Y	Y	8/12
Credit 5.2 Local/Regional Materials, of 20% Above, 50% Harvested Locally	N	Y	Y	?	?	N	N	N	?	N			2/12
Credit 6 Rapidly Renewable Materials	N	N	N	N	N	N	N	?	?	N			0/12
Credit 7 Certified Wood	N	N	N	N	?	Y	Y	N	?	?			2/12
Indoor Environmental Quality													
Credit 1 Carbon Dioxide Monitoring	Y	Y	N	?	Y	Y	Y	Y	Y	N	?	Y	8/12
Credit 2 Increase Ventilation Effectiveness	N	N	?	N	Y	Y	N	N	Y	Y			4/12
Credit 3.1 Construction IAQ Management Plan, During Construction	Y	Y	?	Y	Y	Y	Y	Y	Y	?	Y	Y	10/12
Credit 3.2 Construction IAQ Management Plan, Before Occupancy	Y	Y	Y	?	Y	?	?	Y	Y	?	Y		7/12
Credit 4.1 Low-Emitting Materials, Adhesives & Sealants	Y	N	Y	Y	Y	Y	Y	Y	?	Y	Y	Y	10/12
Credit 4.2 Low-Emitting Materials, Paints	?	N	N	?	Y	Y	Y	Y	Y	Y	Y	Y	8/12
Credit 4.3 Low-Emitting Materials, Carpet	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	?		9/12
Credit 4.4 Low-Emitting Materials, Composite Wood	Y	?	N	?	N	?	Y	Y	Y	?	?		4/12
Credit 5 Indoor Chemical & Pollutant Source Control	?	N	Y	N	?	N	Y	Y	Y	?	Y	Y	6/12
Credit 6.1 Controllability of Systems, Perimeter	N	N	N	N	?	N	N	N	?	N			0/12
Credit 6.2 Controllability of Systems, Non-Perimeter	N	N	N	?	?	N	N	N	?	N			0/12
Credit 7.1 Thermal Comfort, Comply with ASHRAE 55-1992	?	Y	Y	?	Y	?	Y	Y	Y	Y			7/12
Credit 7.2 Thermal Comfort, Permanent Monitoring System	?	Y	Y	Y	?	N	Y	Y	Y	?			6/12
Credit 8.1 Daylight & Views, Daylight 75% of Spaces	Y	N	?	N	?	Y	?	Y	?	N			3/12
Credit 8.2 Daylight & Views, Views for 90% of Spaces	Y	N	Y	N	?	N	N	N	?	N			2/12
Innovation & Design Process													
Credit 1.1 Innovation in Design	Y	Y	Y	?	?	N	?	Y	?	N	Y		5/12
Credit 1.2 Innovation in Design	N	?	?	Y	N	N	?	Y	?	N			2/12
Credit 1.3 Innovation in Design	N	?	N	?	N	N	?	N	?	N			0/12
Credit 1.4 Innovation in Design	N	N	N	?	N	N	?	N	?	N			0/12
Credit 2 LEED Accredited Professional	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	12/12
PROJECT TOTALS Y	27	26	28	18	24	25	25	45	29	11	26	26	
N	5	6	6	28	22	8	16	8	28	18	5	0	

LEED Rating Levels

26 - 32	LEED Certified
33 - 38	LEED Certified Silver Level
39 - 51	LEED Certified Gold Level
52 - 69	LEED Certified Platinum Level

KEY

Y	Yes, pursued or will pursue
?	Maybe, uncertain if will pursue or not
N	No, not pursued or will not pursue
	Available credit, but not used

Smarter Solutions

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GSA Public Buildings Service
Office of the Chief Architect

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