



LEED and WRI

Tuesday, August 21st, 2007

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Introduction to LEED

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Why Build Green?

In the United States, buildings account for:

- 36% of total energy use/ 65% of electricity consumption
- 30% of greenhouse gas emissions
- 30% of raw material use
- 30% of waste output/ 136 million tons annually
- 12% of potable water consumption

In addition:

The average person spends over 90% of their lives indoors

The U.S. Green Building Council, August 2007

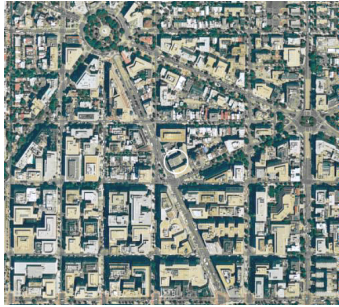
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How Did LEED Get Its Start?

When the USGBC was forming, the first question became "What is the definition of a green building?" This spawned what became the five LEED categories:

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- Sustainable Sites

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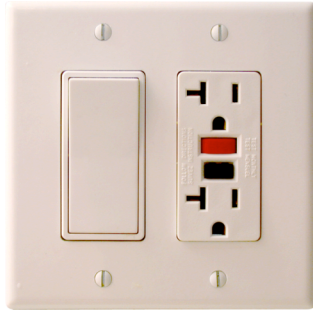


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- Sustainable Sites
- Water Efficiency

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- Water Efficiency
- Energy & Atmosphere

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- Water Efficiency
- Energy & Atmosphere
- Materials & Resources

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- Sustainable Sites
- Water Efficiency
- Energy & Atmosphere
- Materials & Resources
- Indoor Environmental Quality

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The Birth of a Rating System:

In working on a definition, the USGBC decided they needed a way to **measure** and **recognize** green buildings.

Later, Rob Watson coined the name “LEED”.

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The Next Question:

What is essential to be considered a green building?

This established the prerequisites:

- Erosion & Sediment Control
- Fundamental Building Systems Commissioning
- Minimum Energy Performance
- CFC Reduction in HVAC Equipment
- Storage & Collection of Recyclables
- Minimum IAQ Performance
- Environmental Tobacco Smoke Control

And the discussion is ongoing...

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The Big Realization: No one is an Expert at Everything!

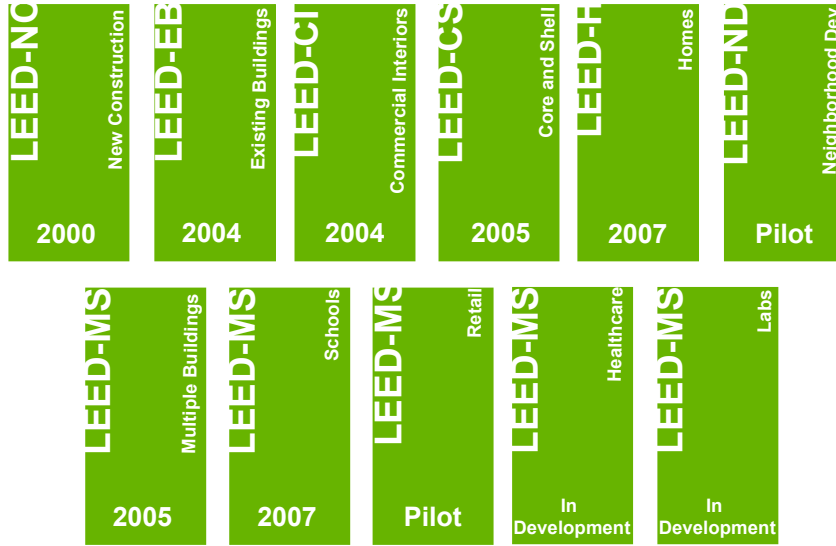
The USGBC grew into a bigger and more diverse entity:

- Architects & Interior Designers
- Engineers
- Contractors
- Developers & Real Estate Firms
- End Users
- Product Manufacturers
- Educators
- Governments and Institutions

And more...

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The LEED Products:



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What's Going on with the USGBC?

8,460 member organizations - a ten fold increase since 2000.

91,000 actively engaged individuals.

5,985 LEED Registered Projects.

781 LEED Certified Projects.

LEED Projects in all 50 states and 24 countries.

More than 35,000 people have become LEED APs

The U.S. Green Building Council, April 2007

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How is LEED Changing the way Developers Think?



1101 New York Avenue, Washington, DC
Architect: Kevin Roche John Dinkeloo & Associates
Developer: Louis Dreyfus Property Group
LEED Core & Shell Pilot Project

“We are taking a bet that a LEED building will have more value in 10 years. We also believe that a LEED building will have more value than a green building that is not LEED certified. When we go to the closing, the LEED certification will be worth something”

“If you are already building good buildings, LEED is easy. If you are building cheap buildings, LEED is difficult.”

“LEED is starting to get ‘legs’ in the development community.”

- Sean Cahill
Senior Development Manager
Louis Dreyfus Property Group

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How is LEED Changing the way Manufacturers Think?



Knoll's Lubin Manuf. Facility, East Greenville, PA
Original Architect: Mitchell/Giurgola Architects
LEED Consultant: Envision
LEED Existing Buildings Pilot Project - Gold Certified

“LEED has accelerated planning for the implementation of green systems and has prevented any ‘backsliding’.”

“LEED has set a new benchmark for the industry.”

“Third-party certification such as ISO 14001, Green Guard, FSC, and LEED adds to our credibility.”

“We have benefited from the LEED-EB process through the creation of manual and standards, and made our commissioning process more thorough and rigorous.”

- Lou Newett
Manager, Environmental Health and Safety
Knoll

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How is LEED Changing the way Manufacturers Consider ROI?



Knoll's Lubin Manuf. Facility, East Greenville, PA
Original Architect: Mitchell/Giurgola Architects
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LEED Existing Buildings Pilot Project - Gold Certified

"In manufacturing, the typical ROI is two years. Going through the LEED-EB process allowed us to make a change in corporate thinking." - Lou Newett, Knoll

Option #1: switch from T-12 lamps to T-8 lamps

Investment: \$12,000

Annual ROI: \$10,000

Summary: In less than two years the initial investment is paid off followed by an annual savings of \$10,000.

Option #2: Switch from T-12 lamps to T-5 lamps

Investment: \$100,000

Annual ROI: \$42,000

Summary: In less than three years the initial investment is paid off followed by an annual savings of \$42,000.

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Does LEED Cost More?



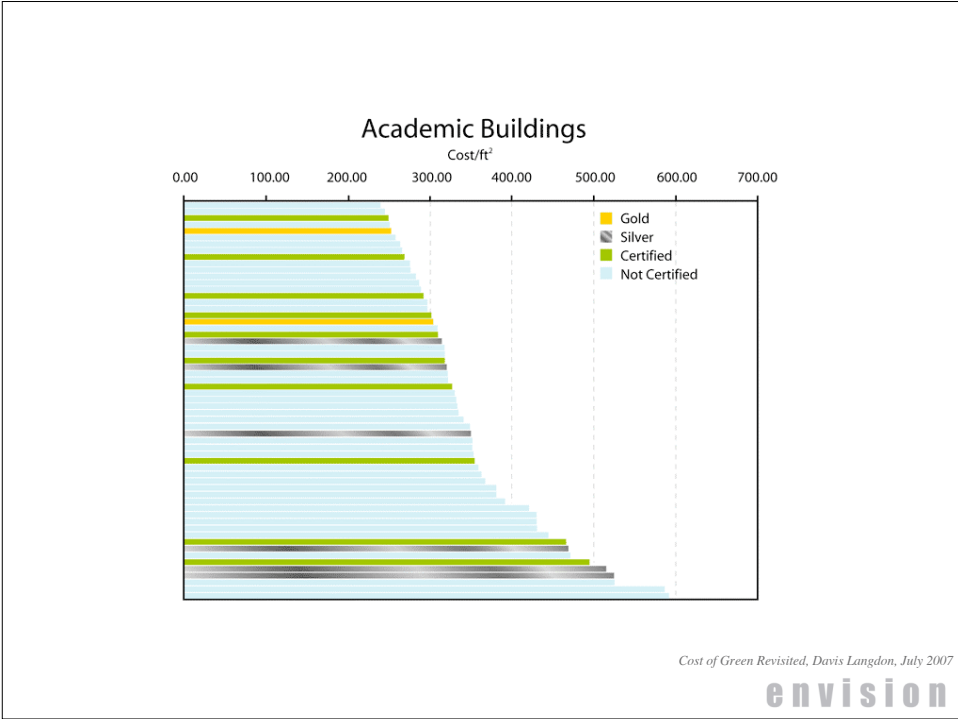
It all depends on your definition of cost and who is paying the bill.

Should a smartly designed building cost more than a poorly designed building?

Does quality have more value than mediocrity?

Almost everything you do to achieve LEED credits adds value to a project in terms of quality or long term ROI.

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Is LEED the “Be All - End All” for Green Building?

NO

LEED is a yardstick.

We should all strive to go beyond LEED.

LEED does not apply equally to every project.

LEED is the triumph of good over perfect.

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What is the Future of LEED?

LEED Version 3.0 will seek to improve the system from both a process and technical standpoint:

- More environmental benefit from each credit
- More research
- More basis on life cycle environmental impacts
- More performance based credits
- More bio-regional weighting
- Streamlined documentation process

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LEED-CI Primer

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LEED-CI Point Distribution

Points	
7	Sustainable Sites
2	Water Efficiency
12	Energy and Atmosphere
14	Materials and Resources
<u>17</u>	Indoor Environmental Quality
52	
4	Innovation and Design Process
<u>1</u>	LEED Accredited Professional [LEED AP]
57	Total Points Available

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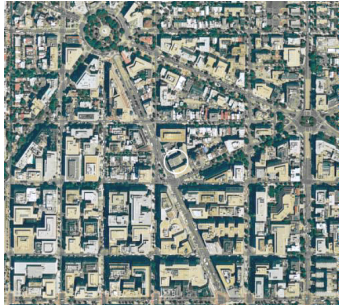
LEED-CI Rating System

4 levels of certification:

Certified	21-26 points
Silver Level	27-31 points
Gold Level	32-41 points
Platinum Level	42-57 points

Free LEED-CI rating system available at
www.usgbc.org

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Sustainable Sites

Site Selection

- LEED certified buildings are encouraged

Development Density and Community Connectivity

- Buildings in urban settings value higher

Alternative Transportation

- Public transport and alternative forms of transportation such as cycling to work and limited car parking are all encouraged

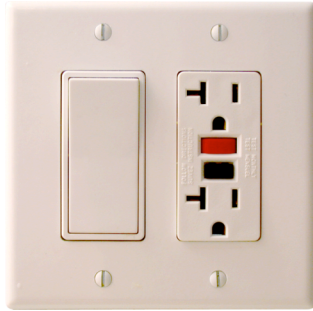
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Water Efficiency

- Reducing the water usage in plumbing fixtures such as low flow toilets, waterless urinals, adding aerators to faucets and using timed sensors are required for points

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Energy & Atmosphere

Prerequisites

- Ensuring the base building systems are energy efficient and work as designed

Energy Performance

- Designing the lighting and HVAC systems to be energy efficient

Tenant Resources

- Designing energy systems to encourage tenants to conserve power

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Materials & Resources

Prerequisites

- Requiring the tenant to recycle

Material Selection

- Encouraging the reuse of available materials in the existing space, and proper disposal of materials that are no longer needed
- Designing the new space to use materials and furniture that have recycled content, are manufactured regionally, are rapidly renewable and use wood from ecologically responsible forests

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Indoor Environmental Quality



Prerequisites

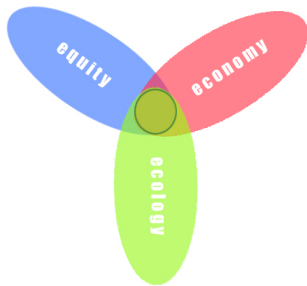
- Ensuring the space is smoke-free and has proper ventilation for adequate fresh air

Health & Comfort

- Encouraging the use of low-emitting materials that limit off-gassing
- Designing the new space to have access to natural lighting and views throughout the space
- Allowing the occupant to manipulate the lighting and temperature control

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Innovation in Design



- Encouraging new ideas that are not currently in the standards such as green housekeeping, educational programs and exceptional performance in existing categories (such as the use of recycled materials)

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World Resources Institute

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Sustainable Sites



Site Selection

- 100% underground parking

Development Density and Community Connectivity

- Building located in an urban area with services such as banks, libraries, post offices and restaurants


Alternative Transportation

- Building site allows cycling to work as well as metro and commuter trains

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Yes	?	No	Sustainable Sites		7 Points
4	0	3			
1	2		Credit 1	Site Selection	1 to 3
				<input type="checkbox"/> Select a LEED Certified Building	3
				OR Locate the tenant space in a building with following characteristics:	1 to 3
				<input type="checkbox"/> Option 1A Brownfield Redevelopment	1/2
				<input type="checkbox"/> Option 1B Stormwater Management: Rate and Quantity	1/2
				<input type="checkbox"/> Option 1C Stormwater Management: Treatment	1/2
				<input checked="" type="checkbox"/> 0.5 Option 1D Heat Island Reduction: Non-Roof	1/2
				<input type="checkbox"/> Option 1E Heat-Island Reduction: Roof	1/2
				<input type="checkbox"/> Option 1F Light Pollution Reduction	1/2
				<input type="checkbox"/> Option 1G Water Efficient Irrigation: Reduce by 50%	1/2
				<input type="checkbox"/> Option 1H Water Efficient Irrigation: No Potable Use or No Irrigation	1/2
				<input type="checkbox"/> Option 1I Innovative Wastewater Technologies	1/2
				<input type="checkbox"/> Option 1J Water Use Reduction: 20% Reduction	1/2
				<input type="checkbox"/> Option 1K Onsite Renewable Energy	1/2 to 1
				<input checked="" type="checkbox"/> 0.5 Option 1L Other Quantifiable Environmental Performance	1/2 to 3
1			Credit 2	Development Density and Community Connectivity	1
1			Credit 3.1	Alternative Transportation: Public Transportation Access	1
1			Credit 3.2	Alternative Transportation: Bicycle Storage & Changing Rooms	1
		1	Credit 3.3	Alternative Transportation: Parking Availability	1

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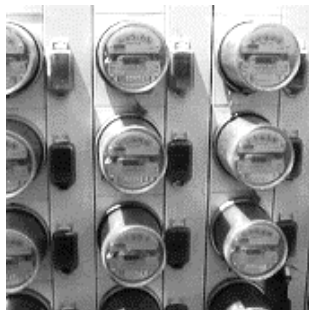
Water Efficiency

- Incorporated aerators on pantry faucet to reduce the flow of water (note: due to the limited plumbing involved in the expansion, no points were given)

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Yes	?	No			2 Points
0	0	2	Water Efficiency		
		1	Credit 1.1	Water Use Reduction - 20% Reduction	1
		1	Credit 1.2	Water Use Reduction - 30% Reduction	1

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Energy & Atmosphere

Prerequisites

- The HVAC system does not contain any CFC-based refrigerants

Energy Performance

- Extremely efficient lighting resulted in a 33.89% reduction below the standard energy use for lighting
- Lighting in corridors along windows have daylight sensors to reduce the light output of the fixture if sunlight is strong
- 100% of appliances and equipment (including computers and printers) are Energy Star rated

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Energy & Atmosphere



Tenant Resources

- WRI has purchased Green Power (electricity from renewable sources) for 100% of electricity for the expansion space for two years

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Yes	?	No	Energy & Atmosphere		12 Points
8	0	4			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Prereq 1	Fundamental Commissioning	Required
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Prereq 2	Minimum Energy Performance	Required
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Prereq 3	CFC Reduction in HVAC&R Equipment	Required
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Credit 1.1	Optimize Energy Performance - Lighting Power	1 to 3
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/> Option A: Reduce lighting power density to 15% below the standard	1
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/> Option B: Reduce lighting power density to 25% below the standard	2
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/> Option C: Reduce lighting power density to 35% below the standard	3
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Credit 1.2	Optimize Energy Performance - Lighting Controls	1
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Credit 1.3	Optimize Energy Performance - HVAC	1 to 2
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/> Option A: Equipment Efficiency and Zoning & Controls	1 to 2
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/> Option B: Reduce Design Energy Cost	1 to 2
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Credit 1.4	Optimize Energy Performance - Equipment and Appliances	1 to 2
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/> 70% of ENERGY STAR eligible equipment is ENERGY STAR rated	1
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/> 90% of ENERGY STAR eligible equipment is ENERGY STAR rated	2
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Credit 2	Enhanced Commissioning	1
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Credit 3	Energy Use, Measurement & Payment Accountability	1 to 2
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/> Case A: Projects with area less than 75% of total building area	1 to 2
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/> Case B: Projects with area 75% or more of total building area	2
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Credit 4	Green Power	1

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Materials & Resources



Material Selection

- A phenomenal 98.41% of construction, demolition and packing debris was diverted to uses other than landfills
- The drywall, carpet, systems furniture, seating, ceiling tile and millwork all contain recycled content, both post-industrial and post-consumer
- 69.25% of all wood-based materials such as doors and millwork are certified in accordance with the Forest Stewardship Council Principles and Criteria.

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Yes	?	No	Materials & Resources		14 Points
4	0	10			
Y			Prereq 1	Storage and Collection of Recyclables	Required
1			Credit 1.1	Tenant Space, Long Term Commitment	1
		1	Credit 1.2	Building Reuse, Maintain 40% of Interior Non-Structural Components	1
		1	Credit 1.3	Building Reuse, Maintain 60% of Interior Non-Structural Components	1
1			Credit 2.1	Construction Waste Management, Divert 50% From Landfill	1
1			Credit 2.2	Construction Waste Management, Divert 75% From Landfill	1
		1	Credit 3.1	Resource Reuse, 5%	1
		1	Credit 3.2	Resource Reuse, 10%	1
		1	Credit 3.3	Resource Reuse, 30% Furniture and Furnishings	1
		1	Credit 4.1	Recycled Content, 10% (post-consumer + 1/2 pre-consumer)	1
		1	Credit 4.2	Recycled Content, 20% (post-consumer + 1/2 pre-consumer)	1
		1	Credit 5.1	Regional Materials, 20% Manufactured Regionally	1
		1	Credit 5.2	Regional Materials, 10% Extracted and Manufactured Regionally	1
		1	Credit 6	Rapidly Renewable Materials	1
1			Credit 7	Certified Wood	1

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Indoor Environmental Quality



Health

- Filters were used during construction to minimize particulates from settling into the space during construction
- Low VOC paint, carpet and adhesives were used
- No added urea-formaldehyde resins are present in any of the composite woods used in the expansion space
- All systems furniture and seating are Greenguard compliant, a test that measures emitting gasses and VOC's.

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Indoor Environmental Quality



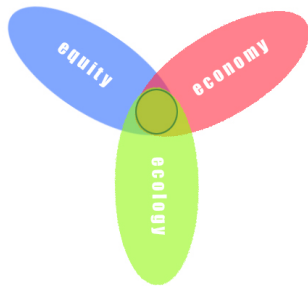
Controllability of Systems

- 100% of occupied spaces have the ability to control their lighting with dimmable fixtures, task lighting or various settings for multi-use spaces such as conference rooms.
- Over half the occupants can control the ventilation and temperature in their space (a remarkable feat in Washington DC)

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Yes	?	No	Indoor Environmental Quality		17 Points
12	0	5			
Y			Prereq 1	Minimum IAQ Performance	Required
Y			Prereq 2	Environmental Tobacco Smoke (ETS) Control	Required
1			Credit 1	Outside Air Delivery Monitoring	1
		1	Credit 2	Increased Ventilation	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 and Sealants	1
1			Credit 4.2	Low-Emitting Materials, Paints and Coatings	1
1			Credit 4.3	Low-Emitting Materials, Carpet Systems	1
1			Credit 4.4	Low-Emitting Materials, Composite Wood and Laminate Adhesives	1
1			Credit 4.5	Low-Emitting Materials, Systems Furniture and Seating	1
		1	Credit 5	Indoor Chemical and Pollutant Source Control	1
1			Credit 6.1	Controllability of Systems, Lighting	1
1			Credit 6.2	Controllability of Systems, Temperature and Ventilation	1
1			Credit 7.1	Thermal Comfort - Compliance	1
1			Credit 7.2	Thermal Comfort - Monitoring	1
		1	Credit 8.1	Daylight & Views - Daylight 75% of Spaces	1
		1	Credit 8.2	Daylight & Views - Daylight 90% of Spaces	1
		1	Credit 8.3	Daylight & Views - Views for 90% of Seated Spaces	1

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Innovation in Design

- The project team received Innovation credits for exemplary performance in:
 - Construction Waste Management
 - Public Transportation Access
 - Green Power
 - Green Housekeeping
- All members of the design team were LEED accredited; the engineer and contractor all had LEED AP staff members working on the project

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Yes	?	No			Points
5	0	0	Innovation & Design Process		5 Points
1			Credit 1.1	Innovation in Design: Green Power, 100% for 2 years	1
1			Credit 1.2	Innovation in Design: Public Transportation, located within 1/2 mile of 2 commuter rail lines	1
1			Credit 1.3	Innovation in Design: Green Housekeeping	1
1			Credit 1.4	Innovation in Design: Construction Waste Management, 95% diverted from landfills	1
1			Credit 2	LEED™ Accredited Professional	1
33	0	24	Project Totals (pre-certification estimates)		57 Points

Certified: 21 to 26 points, Silver: 27 to 31 points, Gold: 32 to 41 points, Platinum: 42 to 57 points

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Acoustic ceiling tile made with recycled content

Fluorescent lighting with daylight and occupant sensors

Clearstory

Zero VOC paint

FSC & formaldehyde free worksurface substrate

Workstations with recycled metal

Rubber base

Carpet with recycled content and low VOC adhesive



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Acoustic ceiling tile made with recycled content

Fluorescent lighting

Agrifiber core door with FSC veneer and low VOC stain

Zero VOC paint

Fabric made with recycled content

Carpet with recycled content and low VOC adhesive



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Other LEED-CI Projects

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Environmental Defense

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Environmental Defense

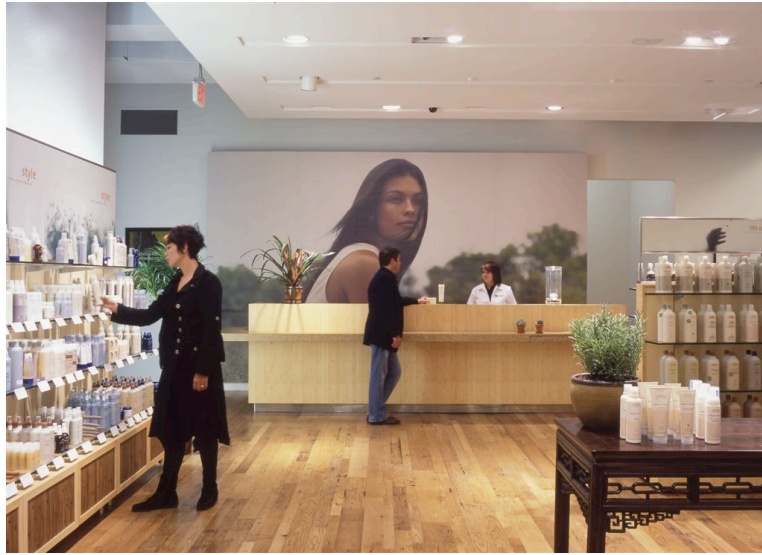


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Environmental Defense



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Aveda Institute Washington, DC

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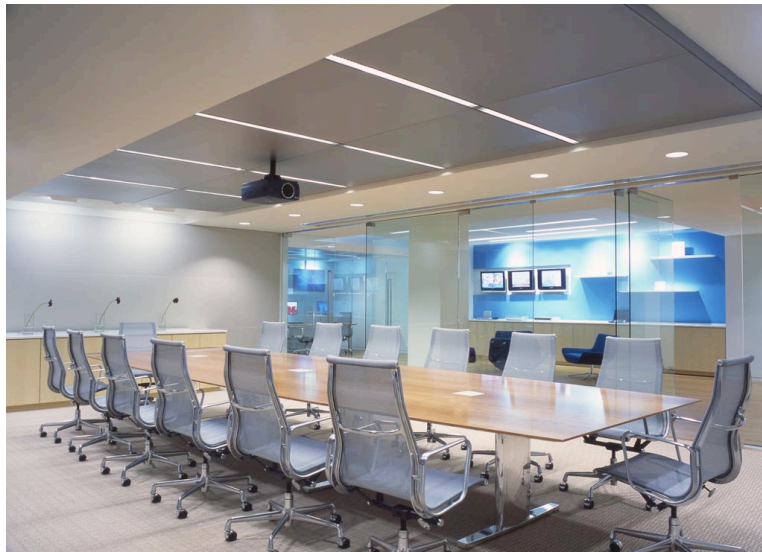
Aveda Institute Washington, DC

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National Datacast, Inc.

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National Datacast, Inc.

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National Datacast, Inc.

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Society for Neuroscience Headquarters

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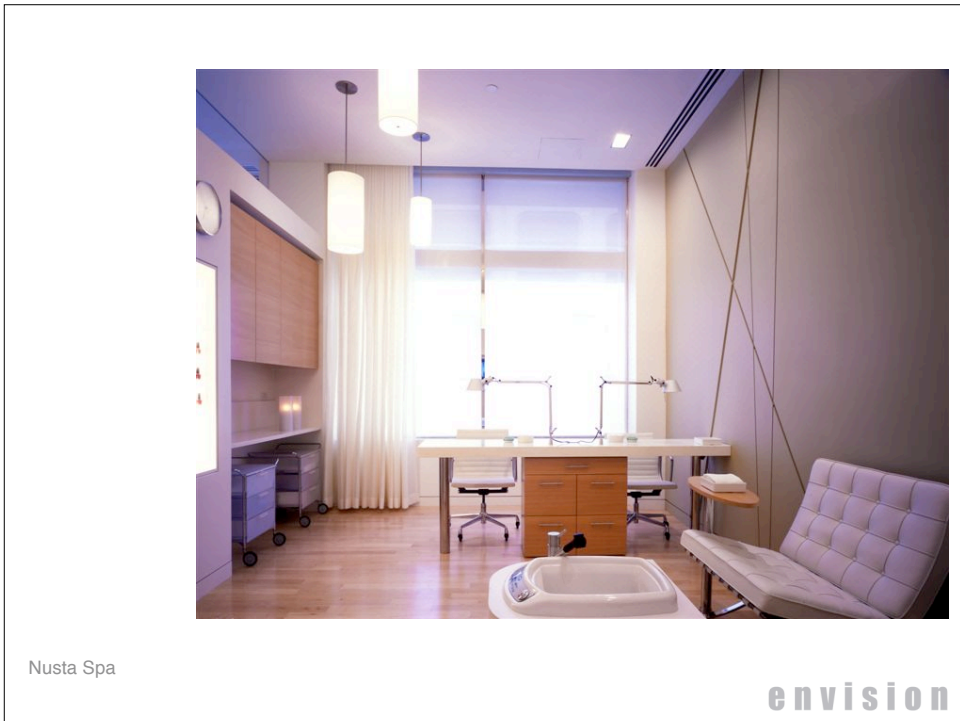
Nusta Spa

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Nusta Spa

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environmental commitment
 Most people are not aware of the environmental impact of the products they buy. At Nusta SpA, we are committed to the environment and we will continue to work on it every day. We are committed to the environment and we will continue to work on it every day.

daylighting / sensors
 The use of daylight sensors in the main areas of the building allows us to optimize energy consumption. The sensors detect the amount of daylight and adjust the lighting system accordingly. This system is installed in the main areas of the building. This system is installed in the main areas of the building.

recyclables
 The use of recyclable materials in the construction of the building is a key element of our environmental commitment. We have used recycled paper for the walls and floor coverings. This system is installed in the main areas of the building.

bamboo
 The use of bamboo for the flooring is a key element of our environmental commitment. Bamboo is a sustainable and renewable resource. This system is installed in the main areas of the building.

carpet
 The use of carpet is a key element of our environmental commitment. We have used low pile carpet in the main areas of the building. This system is installed in the main areas of the building.

LED lighting
 The use of LED lighting is a key element of our environmental commitment. We have used energy efficient LED lighting in the main areas of the building. This system is installed in the main areas of the building.

paints and adhesives
 The use of low VOC paints and adhesives is a key element of our environmental commitment. We have used low VOC products in the main areas of the building. This system is installed in the main areas of the building.

blueprint seal number
 The use of a blueprint seal number is a key element of our environmental commitment. We have used a blueprint seal number in the main areas of the building. This system is installed in the main areas of the building.

advanced ceiling
 The use of an advanced ceiling is a key element of our environmental commitment. We have used an advanced ceiling in the main areas of the building. This system is installed in the main areas of the building.

acoustic ceiling
 The use of an acoustic ceiling is a key element of our environmental commitment. We have used an acoustic ceiling in the main areas of the building. This system is installed in the main areas of the building.

fluorescent lighting
 The use of fluorescent lighting is a key element of our environmental commitment. We have used energy efficient fluorescent lighting in the main areas of the building. This system is installed in the main areas of the building.

low mercury lamps
 The use of low mercury lamps is a key element of our environmental commitment. We have used low mercury lamps in the main areas of the building. This system is installed in the main areas of the building.

tile
 The use of tile is a key element of our environmental commitment. We have used tile in the main areas of the building. This system is installed in the main areas of the building.

built-in casework
 The use of built-in casework is a key element of our environmental commitment. We have used built-in casework in the main areas of the building. This system is installed in the main areas of the building.

oil wood, raw wood
 The use of oil wood and raw wood is a key element of our environmental commitment. We have used oil wood and raw wood in the main areas of the building. This system is installed in the main areas of the building.

wood floor
 The use of wood floor is a key element of our environmental commitment. We have used wood floor in the main areas of the building. This system is installed in the main areas of the building.

stone floor + stone wall
 The use of stone floor and stone wall is a key element of our environmental commitment. We have used stone floor and stone wall in the main areas of the building. This system is installed in the main areas of the building.

green glass
 The use of green glass is a key element of our environmental commitment. We have used green glass in the main areas of the building. This system is installed in the main areas of the building.

Nusta Spa

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