

2008
September—December

FALL

Career Development Programs

Green Globes and the Building Official

Presented by Greg Bergmiller,
LEED Accredited Professional, S/L/A/M Collaborative



Code training programs are made possible through the Code Training and Education Fund. Revenue for the fund comes from assessments on building permits.



September

Visit us at www.ct.gov/dps

The Department of Public Safety, Office of Education and Data Management and the Office of State Building Inspector, present **Green Globes and the Building Official** as an informational guide only. This presentation is based on the requirements of Connecticut General Statutes Section 29-256a; as amended by Public Act 07-242, which provides in relevant part:

(b) Notwithstanding subsection (a) of this section, the State Building Inspector and the Codes and Standards Committee shall revise the State Building Code to require that any (1) building, except a residential building with no more than four units, constructed after January 1, 2009, that is projected to cost not less than five million dollars, and (2) renovation to any building, except a residential building with no more than four units, started after January 1, 2010, that is projected to cost not less than two million dollars shall be built or renovated using building construction standards consistent with or exceeding the silver building rating of the Leadership in Energy and Environmental Design's rating system for new commercial construction and major renovation projects, as established by the United States Green Building Council, or an equivalent standard, including, but not limited to, a two-globe rating in the Green Globes USA design program. The inspector and the committee shall provide for an exemption for any building if the institute for sustainable energy finds, in a written analysis, that the cost of such compliance significantly outweighs the benefits.

This seminar presents only one of the many avenues available to demonstrate compliance. The presentation does not connote endorsement of **Green Globes USA**. This presentation is offered as a resource illustrating what a Green Globes packet should look like for on-the-job application. The intent of this program is to share information as to what one information source may look like.

Why are we here today?

- Introduction to the Green Building Initiative
- Discuss importance of making “green” decisions for new buildings
- Learn how green rating systems, like Green Globes™, can help
- See Green Globes approach to assessment
- Who is using Green Globes
- Q&A

About GBI

GBI Official Start in 2005

501(c)3 non-profit association

Mission

“accelerating the adoption of green building practices in residential and commercial sectors”

American National Standards Institute (ANSI) accredited Standard Developing Organization (SDO) in 2005

Own U.S. license for Green Globes™

Developing GG into first American National Standard for commercial green buildings

ISO/ANSI Compliant Certified Green Globes Assessor

program to launch in 2008

Residential Outreach

Resulted in 55,000 builders gaining access to green home programs in states/cities where non previously existed

Why Green?

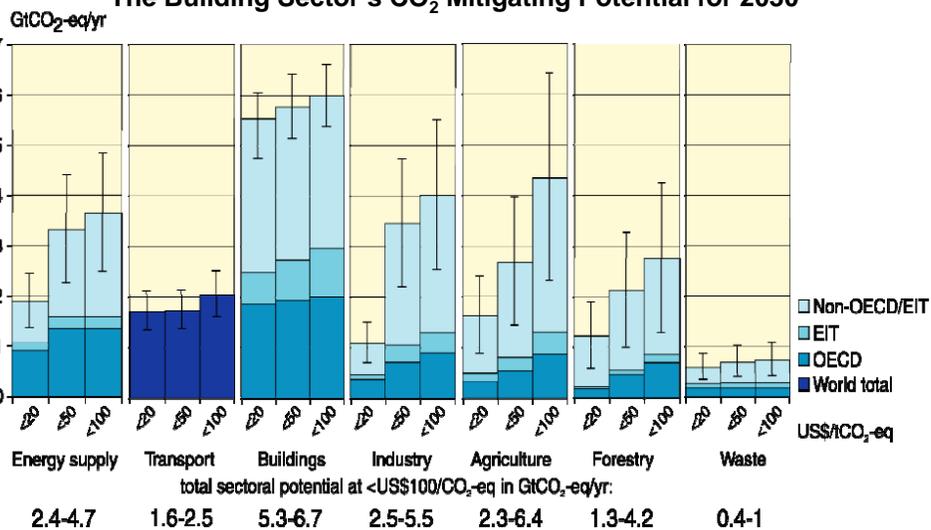
Increasing legislative pressure to disclose and take action

Much higher consumer awareness

More Investor focus on a company's climate change strategy

Increasing NGO and advocacy groups monitoring company activity

The Building Sector's CO₂ Mitigating Potential for 2030



INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC)



New Building Challenges

- At what stage(s) do we influence the “greenness” of a building?
- What decisions do I make that impact Green?
- What does my team benchmark against?
- Are there best practices to follow?
- How does green certification help...owner, design team, tenants/occupants, community?

How Do You Get Started?

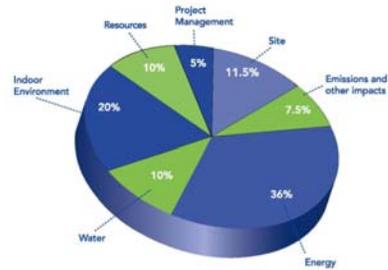
Green Rating Systems Can Help...



Green Globes-New Construction

7 Assessment Areas

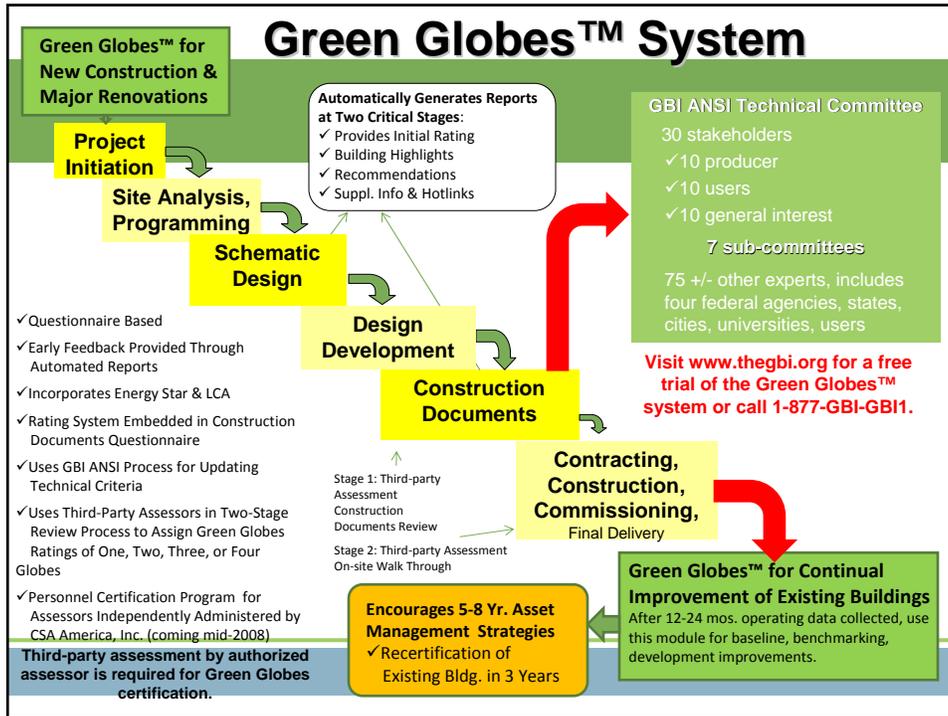
1. Project Management
2. Site
3. Energy
4. Water
5. Resources
6. Emissions & Haz Matls.
7. Indoor Environment



Uses 1000 possible points to assess a building's environmental attributes.

Green Globes Highlights

✓	Online assessment walks users through each stage of design, construction, and delivery
✓	Users answer questions about design goals and projected performance outcomes
✓	Tooltips provide guidance on each question
✓	Construction Documents Stage Questionnaire is what the Green Globes rating is based on
✓	Automatically generates comprehensive report
✓	Two-stage third-party assessment required for certification and includes site walk through
✓	Recognition program includes plaque and public relations support material



GREEN GLOBES™-NC Versions

Green Globes™ - Version 0

- **Green Globes 2005 = Green Globes version 0 (GG v.0)**
 - GG v.0 is in use TODAY – is the original version that came from Canada
 - There will be 20+ buildings certified in the U.S. under v.0 before end of 2008
 - GG v.0 is the version available online at www.thegbi.org/GreenGlobesTools
 - It will be available to anyone who signs up for Green Globes NC from now until approximately June of 2009
 - All buildings entered into this system by a certain date **WILL BE ABLE TO COMPLETE** their process and certify to this version without fear of being “turned off” once the next version of Green Globes is released



Use this version of Green Globes NC today!

Green Globes™ - Version 1

- **Green Globes 2006 = Green Globes version 1 (GG v.1)**
 - Was available only in paper format
 - Used by GBI Technical Committee as the starting place for the ANS document
 - No buildings were certified under this version

Green Globes™ - Version 2

- **Green Globes 2008-9 = GBI ANS 01-200XP (or GG v.2)**
 - Is going through final rounds of revision by GBI Technical Committee
 - First public comment period closed June 9, 2008
 - Second public comment period will be fall 2008
 - Final GBI American National Standard expected to be released end of 2008 or early 2009
 - Green Globes online tool programming will commence Jan. 2009, tool available approx. June 2009



GREEN GLOBES™-NC TECHNICAL CONTENT

Seven Areas of Assessment

1 Project Management (100 pts. possible)

Green Globes v.0

Integrated design process

Environmental purchasing

Commissioning (plans for systems testing after construction)

Emergency response plan

GBI 01-200XP

-Coordination and benchmarking

-Environmental mgt. during construction

-Whole building commissioning

-Environmental mgt. post construction



Emergency response flip charts



Environmental Choice™ Program

Seven Areas of Assessment

2 Site (120 pts. possible)

Green Globes v.0

Development area

Ecological impacts (erosion, heat island, light pollution)

Watershed features

Site ecology enhancement

GBI 01-200XP

-Site development areas

-Ecological impacts

-Watershed features

-Site ecology (landscaping & irrigation)

-Exterior light pollution



Natural corridor and Riparian Zone



Green roof



Brownfield



Native plant species – Bullrushes, Goldenrod, and Switchgrass



Seven Areas of Assessment

3 Energy (300 pts. possible)

Green Globes v.0

Energy performance - benchmark to EPA Energy Star, pts. start at 75 mark

Reduced demand (space optimization, microclimatic design, daylighting, envelope design, metering)

Energy efficiency features (lighting, heating & cooling equipment).

Renewable energy

Transportation

GBI 01-200XP

Performance Path A

- CO2e performance (50% reduction min., passive demand response, etc.)
- Measurement and verification

Prescriptive Path B

- Building opaque envelope
- Daylighting
- HVAC systems and controls
- Lighting systems and controls
- Vertical transport
- Renewable energy



Hydrogen station

Green roof

Efficient lighting

Bicycle storage

Energy metering

Wind turbine

Seven Areas of Assessment

4 Water (130 pts. possible)

Green Globes v.0

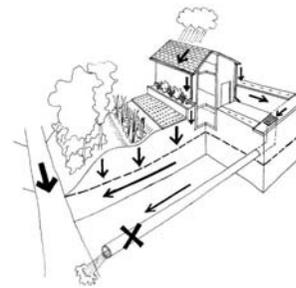
Water performance

Water conserving features (equipment, meters, irrigation systems)

On-site treatment (stormwater, greywater, blackwater)

GBI 01-200XP

- Plumbing, fixtures, fittings, appliances, and equipment
- Cooling towers
- Boilers and water heaters
- Commercial food service equipment
- Medical/dental/lab facilities
- On premise laundry operations
- Special water features
- Water treatment
- Alternate sources of water
- Metering



Permeable paving

Solar aquatics wastewater treatment.

Low-flush toilet

Bioswale.

Water-saving showerheads

Seven Areas of Assessment

5 Resources (145 pts. possible)

Green Globes v.0

Low-impact systems and materials (LCA)

Minimal use of non-renewables

Reuse of existing buildings

Durability, adaptability and disassembly

Demolition waste

Recycling & composting facilities

GBI 01-200XP

Performance Path A

-Assemblies-LCA Credit Calculator

-Furnishings-any LCA tool

Prescriptive Path B

Assemblies

-Recycled content, transportation of mats.

-Furnishings, finishes, fit outs

-Other material properties

Both

-Other material properties

-Forest certification of wood products

-Re-use existing structures

-Reduction, reuse, recycling of waste

-Resource conservation through design (reuse, disassembly)

-Building envelope



Reused Buildings

Alternative composite panels

Recycled carpet

Seven Areas of Assessment

6 Emissions & Storage of Hazardous Materials (45 pts. poss.)

Green Globes v.0

Air emissions (boilers)

Ozone depletion

Sewer & waterway protection

Pollution control (procedures, compliance with standards)

GBI 01-200XP

-Heating equipment

-Cooling equipment

-Storage of hazardous materials



Recuperative boiler



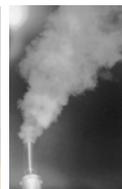
Low-NOx burners



Pest prevention



Storage Tank



Smog



MSDSs, equipment manuals, etc.

Seven Areas of Assessment

7 Indoor Environment (160 pts. possible)

Green Globes v.0

Ventilation system

Indoor pollution control

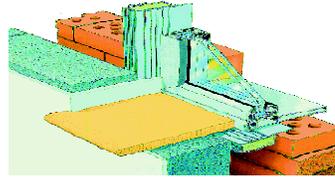
Lighting (daylighting & electric)

Thermal comfort

Acoustic comfort

GBI 01-200XP

- Ventilation systems
- Source control and indoor pollutants
- Integrated pest management
- Lighting design and integration of lighting systems
- Thermal comfort
- Acoustic comfort



Insulated cavity closer discourages mould and bacteria growth



GREEN GLOBES™ Ratings/Certification & Recognition

Third-party Assessment Is Required to Obtain Green Globes Rating/Certification

Once an assessment is verified by a third party, properties achieving a score of 35% or more receive a Green Globes rating based on the percentage of total points (up to 1000) achieved.

85-100%		Reserved for select building designs which serve as national or world leaders in energy and environmental performance. The project introduces design practices that can be adopted and implemented by others.
70-84%		Demonstrates leadership in energy and environmental design practices and a commitment to continuous improvement and industry leadership.
55-69%		Demonstrates excellent progress in achieving eco-efficiency results through current best practices in energy and environmental design.
35-54%		Demonstrates movement beyond awareness and commitment to sound energy and environmental design practices by demonstrating good progress in reducing environmental impacts.

Buildings that have a predicted rating of 35% or more can pursue third-party assessment. Third-party assessment is required to publicize your building as a Green Globes rated/certified building.

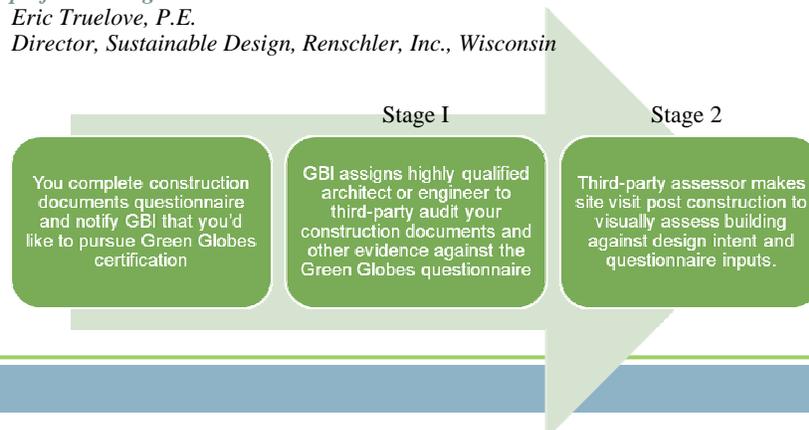
One to four globes are possible and our recognition program includes a plaque and PR kit. Case study development is encouraged.

Two-Stages to Third-Party Review

"I've been impressed with the system's ability to provide both education and on-site third-party assessment. It's a flexible yet comprehensive tool that encourages users to learn more about green while working toward specific performance goals."

Eric Truelove, P.E.

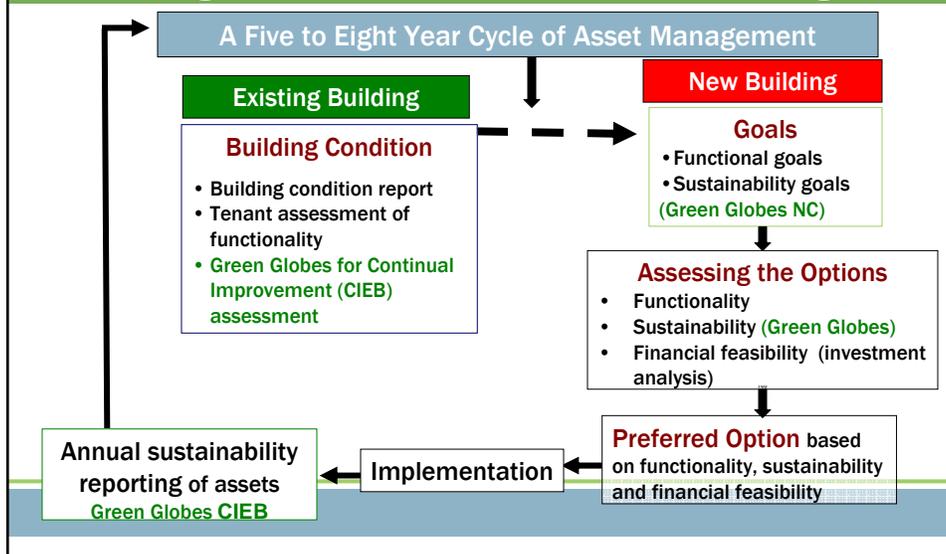
Director, Sustainable Design, Renschler, Inc., Wisconsin



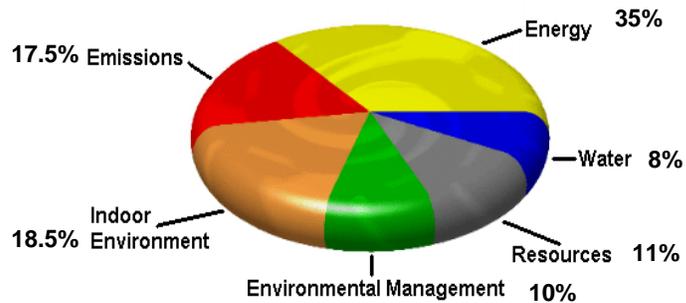
GREEN GLOBES™

Provides a Continuum For Projecting & Measuring Performance

Green Globes Provides Market Recognition...But Also Encourages



Green Globes for Continual Improvement of Existing Buildings Measures Actual Performance Results



Also uses 1000 possible points to assess a building's environmental attributes.

Green Globes-CIEB Highlights



Users input 12-months of utility data

- Energy bills
- Water bills



Owner / facility manager / chief engineer driven

- Conduct survey of building
- Evaluate performance issues



Assess environmental management systems

- Policies, procedures, training
- Tenant/occupant surveys

The GBI: Green Globes Sneak Peek - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.thegbi.org/lp/sneak-peek-images.asp#ProjectList

Getting Started Latest Headlines LEGO Home

GREEN BUILDING INITIATIVE Environmental Assessment for New Commercial Buildings **GREEN GLOBES**

YOUR PROJECT LIST | INSTRUCTIONS | DEMONSTRATION | USER FORUM | MANAGE MY ACCOUNT | LOGOUT

SELECT/ADD PROJECT SELECT STAGE SELECT SECTION COMPLETE QUESTIONNAIRE VIEW REPORT

User: ustest@greenglobes.com

Your Project List

Select a column header to sort.

Project	Proj. leader	Address	City	St.	Proj. client
Alberici HQ		8800 Page Ave.	Overland	MO	Alberici Redevelopment Corporation
Downtown Condominium		123 Numbered Street	New York	NY	The Client
Family Centre		Green Lane	New York	NY	Family Group
Gateway Project		Washington DC	Washington DC	DC	n/a
Headquarters		1111 19th Street	n/a	WI	n/a
Immigrant Women's Centre		1096 Gerrard Street East	n/a	na	n/a
Learning Center		1096 Gerrard Street East	Little Rock	AR	Immigration US
Test - Blakely Hall 1		2550 NE Park Drive 1	Issaquah 1	WA	n/a
US Bad Project		123 Bad St.	Albany	NY	Acme Realty
US Good Building		123 Good St.	Little Rock	AR	Acme Realty
Womens Centre		1000 Progress St	New York	NY	Immigrant Womens Centre

You are currently approved to use the system for 11 projects, and have 11 projects entered.

[Add a new project](#)

Need Help?
[Read Instructions >](#)
[Enter the User Forum >](#)
[View Demo >](#)

Create a new project or click on an existing project

YOUR PROJECT LIST | INSTRUCTIONS | DEMONSTRATION | USER FORUM | MANAGE MY ACCOUNT | LOGOUT

SELECT/ADD PROJECT SELECT STAGE SELECT SECTION COMPLETE QUESTIONNAIRE VIEW REPORT

Alberici HQ - Office (General)

User: ustest@greenglobes.com

[Project Reports \(all stage reports\)](#)
[Edit Basic Project Information](#)

Step through navigation

Schematic Design questionnaire provides early input and automated report with opportunities for improvement

Automatically calculates predicted rating based on points out of 1000

Current Project Rating: 64%

Progress key: ■ Not started ■ In Progress ■ Completed

Project Dashboard	Sections							Total	% of Questions Answered	% of Points Earned
	Proj Mgt	Site	Energy	Water	Resources	Emissions	Indoor Environ.			
Predesign - project init stage										
Predesign - site analysis	N/A						N/A			N/A
Predesign - programming										N/A
Schematic design										N/A
Design development										N/A
Construction documents										N/A
Contracting & construction										N/A
Commissioning		N/A								N/A

Complete Construction Documents Stage Questionnaire to get automated report and before pursuing third-party certification

Color coded progress bars indicate whether questionnaire sections are complete

SECTION DESCRIPTION

This section addresses strategies to ensure that the indoor environment is healthy and comfortable. The design should be developed to provide a high level of indoor air quality, effective lighting, thermal comfort and suitable acoustic conditions.

Case Study

Pfizer Clinical Research Unit - Other

Current Stage Rating



VERIFIER'S WORKSHEET: Construction Documents (Plans and Specifications)

Sections	Pages Answered	Rating Earned
Project Management	1 of 1	100%
Site	2 of 2	77%
Energy	3 of 3	70%
Water	1 of 1	57%
Resources	1 of 1	50%
Emissions	1 of 1	54%
Indoor Environment	3 of 3	79%
Total	12 of 12	70%

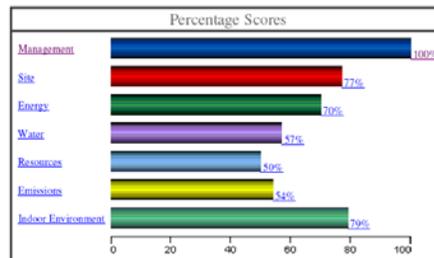
Select a section hyperlink above to jump to that place in the report.

Case Study-Introduction

Summary of Your Achievement: Pfizer Clinical Research Unit achieved an overall rating of 70% (660 points scored out of 939 applicable).

To find out how the performance of Pfizer Clinical Research Unit compares to other buildings that have been assessed, and to obtain certification, the data must be verified by a licensed engineer or architect who has undergone the Green Globes training and certification.

Percentage of points achieved by Pfizer Clinical Research Unit for each module:



Case Study- Project Management

PROJECT MANAGEMENT POLICIES AND PRACTICES

Rating Earned: 100%
Applicable Scored
50 50

Question	Answer	Applicable Score	
Integrated design process		20	20
Was an integrated design process used for the design development?	<input checked="" type="radio"/> Yes <input type="radio"/> Partially <input type="radio"/> No	10	10
Was a team approach used during the design process?	<input checked="" type="radio"/> Yes <input type="radio"/> No	5	5
Was the green design facilitation process used to support green design integration?	<input checked="" type="radio"/> Yes <input type="radio"/> No	5	5
Environmental purchasing		10	10
Have aspects of green product specifications been incorporated?	<input checked="" type="radio"/> Yes <input type="radio"/> No	1	1
Give examples of specified products reflecting green specifications:	Ceiling tiles Wheat board Paper products Recycled aluminum	2	2
Was environmental purchasing integrated, including the procurement of energy-saving, high-efficiency equipment?	<input checked="" type="radio"/> Yes <input type="radio"/> No	7	7

Case Study- Project Management

PROJECT MANAGEMENT POLICIES AND PRACTICES: 1

Rating Earned: 100%
Applicable Scored
50 50

Commissioning plan - documentation		15	15
Have the following best-practice, commissioning procedures been implemented?			
• A Commissioning Authority has been engaged.	<input checked="" type="radio"/> Yes <input type="radio"/> No	3	3
• "Design Intent" and "Basis of Design" documentation has been reviewed.	<input checked="" type="radio"/> Yes <input type="radio"/> No	3	3
• Commissioning requirements are included in the Construction Documentation.	<input checked="" type="radio"/> Yes <input type="radio"/> No	3	3
• A Commissioning Plan has been developed.	<input checked="" type="radio"/> Yes <input type="radio"/> No	6	6
Emergency response plan		5	5
Does Division 1 include the project's environmental goals and procedures with regard to emergency response?	<input checked="" type="radio"/> Yes <input type="radio"/> No	5	5

Case Study - Site

Question	Answer	Applicable Score	
Development area		30	25
Does the site plan indicate that the building is constructed on:	Select appropriate		
• an existing serviced site?	<input type="checkbox"/>		
• a remediated, previously contaminated site?	<input checked="" type="checkbox"/>	20	20
• land with an existing minimum development density of 60,000 ft ² /acre (i.e. two storey inner city development)?	<input type="checkbox"/>		
• a new greenfield site?	<input type="checkbox"/>		
Does the site plan show that the building is constructed on land that is neither a floodplain, nor a wetland, nor a wildlife corridor?	<input checked="" type="radio"/> Yes <input type="radio"/> No	5	5
Does the design accommodate the building's functions, while minimizing disturbance to the site's topography, soils and vegetation?	<input type="radio"/> Yes <input checked="" type="radio"/> No	5	0
Minimization of ecological impact		30	23
Are erosion control measures in place in accordance with best management practices (including during construction)?	<input checked="" type="radio"/> Yes <input type="radio"/> No	9	9
Will at least 35% of impervious surfaces be shaded - preferably with trees, shrubs or vines?	<input checked="" type="radio"/> Yes <input type="radio"/> No	7	7

Case Study - Site

Do the construction documents specify measures to reduce heat build-up on the roof, either by using high-albedo roofing materials (reflectance of at least 0.65 and emissivity of at least 0.9) for a minimum of 75% of the roof surface, or by constructing a green roof, or by a combination of both high-albedo materials and green roof?	<input type="radio"/> Yes - by means of a green roof <input type="radio"/> Yes - by a combination of high albedo materials and green roof <input type="radio"/> No	7	7
Will the obtrusive aspects of exterior lighting such as glare; light trespass and sky glow be minimized and will the building design reduce collisions of birds with building?	<input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> N/A	7	0
Enhancement of watershed features		15	0
Will storm water run-off be controlled to prevent damage to project elements and vegetation, and to minimize run-off into waterways such that:			

Case Study - Site

Select applicable for site conditions:

- There is no storm water management.
- Storm water is directed to pervious areas.
- In the case of a site which was previously 100% pervious (green site), there will be no increase in run-off.
- In the case of a site whose pre-development impervious area is greater than 50% (site previously built on), a storm water control plan will achieve a 25% decrease in storm water run-off. 15 0

Select applicable for roof conditions:

- There are no specific measures to reduce, control or direct run-off from the roof.
- Run-off from the roof will be controlled and directed to a pervious area.
- There will be a green roof.

State the pre-development ratio of pervious to impervious area: %

State the post-development ratio of pervious to impervious area: %

Enhancement of site ecology		40	40
Is the development occurring on a brownfield site that is being remediated?	<input checked="" type="radio"/> Yes <input type="radio"/> No	20	20
Does the landscape plan create/preserve natural core and corridors and/or specify a naturalized landscape using native trees, shrubs and ground cover, with minimal lawn?	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A	20	20

Case Study - Energy

ENERGY

Rating Earned: **70%**
Applicable Scored
369 257

Question	Answer	Applicable	Scored
Building energy performance		100	40
Have the energy performance targets been achieved?	<input checked="" type="radio"/> Yes <input type="radio"/> No		
Input the value of the projected annual energy use in kBtu.	<input type="text" value="0"/>	100	40
Input the value of the projected energy savings as a percentage compared to the	<input type="text" value="20"/> %		
Energy demand minimization		107	75
Space Optimization			
Has the floor area been optimized to efficiently fulfill the building's functional and spatial requirements, including circulation and services, while minimizing the amount of space that will need to be heated or cooled?	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A	2	2
Describe how the space is being optimized:	Laboratories on the third floor to minimize the runs for mechanical equipment	6	6
Will the construction process be phased?	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A	0	0

Case Study - Energy

Response to microclimate and topography

Is the building sited and oriented to optimize the effect of microclimatic conditions for heating or cooling?	<input checked="" type="radio"/> Yes <input type="radio"/> No	2	2
Describe how the building is sited and oriented to optimize effects of microclimatic conditions:	Axis of the building east west Building set back to allow the acces of sunlight to help snow melting and daylight	6	6
Are site topography and design measures - including location and orientation - optimized to provide shelter from wind and snow deposition?	<input checked="" type="radio"/> Yes <input type="radio"/> No	8	8
Does the building design maximize opportunities for natural or hybrid ventilation?	<input type="radio"/> Yes <input checked="" type="radio"/> No	2	0
Describe how the building design maximizes opportunities for natural or hybrid ventilation:	n/a	6	0
Integration of daylighting			
Is daylighting maximized through building orientation, window-to-wall size ratios?	<input checked="" type="radio"/> Yes <input type="radio"/> No	5	5
Briefly describe the fenestration strategy:	Daylight penetration to all regulary occupied spaces	10	10
Is window glazing which optimizes daylight (high visible transmittance (VT)) specified?	<input checked="" type="radio"/> Yes <input type="radio"/> No	2	2
Indicate the VT value:	<input type="text" value="0"/>	8	0

Case Study - Energy

Is electrical lighting integrated with daylighting, taking into account daily and seasonal variations?	<input checked="" type="radio"/> Yes <input type="radio"/> No	10	10
Building envelope			
Does the thermal resistance of the exterior enclosure meet Federal or State Energy Building Codes?	<input checked="" type="radio"/> Yes <input type="radio"/> No	2	2
Indicate the R value for walls:	<input type="text" value="0"/>	4	0
Indicate the R value for the roof:	<input type="text" value="0"/>	4	0
Do the construction documents indicate window glazing with a low U factor and window treatments that enhance interior thermal comfort?	<input checked="" type="radio"/> Yes <input type="radio"/> No	2	2
Indicate the window U value:	<input type="text" value="0"/>	8	0
Do the construction documents specify measures to prevent groundwater and/or rain penetration into the building?	<input checked="" type="radio"/> Yes <input type="radio"/> No	5	5
Is the integrity of the building envelope optimized, using the following best air/vapor barrier practices?	<input checked="" type="radio"/> Yes	2	2
• air barrier materials meet the requirements of local and national building codes			

Case Study - Energy

• drawings provide air barrier detailing between components of the building envelope and around penetrations	<input checked="" type="radio"/> Yes <input type="radio"/> No	1	1
• mock-ups and mock-up testing is required for air and vapor barrier systems	<input checked="" type="radio"/> Yes <input type="radio"/> No	1	1
• field review and testing is required for air and vapor barrier systems	<input checked="" type="radio"/> Yes <input type="radio"/> No	1	1
Will the building design and construction prevent the "stack effect"?	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A	0	0
Energy metering			
Will major energy uses be sub-metered?	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A	5	5
List the major energy uses that will be sub-metered: BAS system designed to monitor energy use		5	5

Case Study - Energy

Question	Answer	Applicable Scored	
Energy-efficient systems		66	66
Is the building's energy efficiency increased through the use of the following energy-efficient equipment?			
• Energy-efficient lighting fixtures, lamps and ballasts	<input checked="" type="radio"/> Yes <input type="radio"/> No	6	6
• Lighting controls	<input checked="" type="radio"/> Yes <input type="radio"/> No	6	6
• Energy-efficient HVAC equipment	<input checked="" type="radio"/> Yes <input type="radio"/> No	6	6
• High efficiency (modulating or condensing) boilers	<input checked="" type="radio"/> Yes <input type="radio"/> No	8	8
• High efficiency chillers	<input checked="" type="radio"/> Yes <input type="radio"/> No	6	6
• Energy-efficient hot water service systems	<input checked="" type="radio"/> Yes <input type="radio"/> No	6	6
• Building automation systems	<input checked="" type="radio"/> Yes <input type="radio"/> No	6	6
• Variable speed drives	<input checked="" type="radio"/> Yes <input type="radio"/> No	6	6
• Energy-efficient motors	<input checked="" type="radio"/> Yes <input type="radio"/> No	6	6
• Energy-efficient elevators	<input checked="" type="radio"/> Yes <input type="radio"/> No	4	4
• Others	<input checked="" type="radio"/> Yes <input type="radio"/> No	6	6
Describe:	Glycol loop heat recovery	0	0

Case Study - Energy

Renewable sources of energy		20	0
Do the construction documents indicate the integration of renewable energy sources?	<input type="radio"/> Renewable energy will supply more than 10% of the total load <input type="radio"/> Renewable energy will supply more than 5% and less than 10% of the total load <input checked="" type="radio"/> No renewable energy	20	0
Energy-efficient transportation		76	76
Public transport			
Will public transport be easily accessible within 500 yards of the building, and with service at least every 15 minutes during rush hour?	<input checked="" type="radio"/> Yes <input type="radio"/> No	50	50
Will there be designated preferred parking for car/van pooling and shelter from weather for persons waiting for a lift?	<input checked="" type="radio"/> Yes <input type="radio"/> No	6	6
Will there be alternative-fuel re-fueling facilities on-site or in the general vicinity?	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A	0	0
Cycling facilities			
Will there be safe, covered storage areas with fixed mountings to secure bicycles against theft?	<input checked="" type="radio"/> Yes <input type="radio"/> No	10	10
Will there be changing facilities for building tenants and staff?	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A	10	10

Case Study - Water

WATER		Rating Earned: 57%	
Question	Answer	Applicable	Scored
Water performance		75	43
Do water consumption estimations meet an established target of:		30	24
<i>Offices</i>	Select One		
Less than 35 gallons/ft ² /year	<input type="radio"/>		
Less than 20 gallons/ft ² /year	<input checked="" type="radio"/>		
Less than 10 gallons/ft ² /year	<input type="radio"/>		
<i>MURBs</i>			
Less than 66,000 gallons/apartment/year	<input type="radio"/>		
Less than 33,000 gallons/apartment/year	<input type="radio"/>	30	24
Less than 11,000 gallons/apartment/year	<input type="radio"/>		
<i>Schools, Universities:</i>			
Less than 1150 gallons/student/year	<input type="radio"/>		
Less than 900 gallons/student/year	<input type="radio"/>		
Less than 720 gallons/student/year	<input type="radio"/>		
<i>No target has been set</i>	<input type="radio"/>		
Water-conserving features		35	19

Case Study - Water

Minimal consumption of potable water

[Is there water sub-metering for high water-usage operations or occupancies?](#) Yes No N/A 2 2

Which operations will be sub-metered? n/a 2 0

[Does the design include the following water-efficient equipment?](#)

- Low-flush toilets (less than 1.6 gallons/flush) Yes 4 4
 No
- Water-saving fixtures on faucets (2.0 gallons/min) and showerheads (2.4 gallons/min.) Yes 4 4
 No
- [Water-saving devices or proximity detectors on urinals](#) Yes 4 4
 No
 N/A
- [Other water-saving appliances \(For example low-flow kitchen faucets, low water consumption domestic and commercial dishwashers \(8 gallons\) and water efficient \(H-axis\)washing machines\).](#) Yes 4 0
 No
 N/A

Briefly describe other water-saving measures:

Minimal use of water for cooling towers

[Where wet cooling towers are used, do they have features to minimize the consumption of make-up water?](#) Yes No N/A 10 0

Case Study - Water

Minimal use of water for irrigation

[Is a water-efficient irrigation system specified?](#) Yes No N/A 0 0

[Will the landscaping use plants that are able to withstand extreme local weather conditions and that require minimal irrigation?](#) Yes No N/A 5 5

[Will non-potable water \(i.e. captured rainwater or recycled site water\) be used for irrigation?](#) Yes, 100% of the irrigation will consist of non-potable water 0 0
 Yes, irrigation consist of non-potable water, supplemented with potable water as needed
 No
 N/A

Minimization of off-site treatment of water 10 0

[Is a graywater collection, storage and distribution system specified?](#) Yes No N/A 5 0

[Is an on-site wastewater treatment system specified?](#) Yes No N/A 3 0

Briefly describe the on-site wastewater treatment: n/a 2 0

Case Study - Resources

RESOURCES, BUILDING MATERIALS AND SOLID WASTE

Rating Earned: 50%
 %Applicable Scored
 80 40

Question	Answer	Applicable	Scored
Systems and materials with low environmental impact		35	0
Did the selection and specification process for the following assemblies and materials include a life cycle assessment of their environmental burden and embodied energy?			
• Foundation and floor assembly materials	<input type="radio"/> Yes <input checked="" type="radio"/> No	10	0
• Structural systems (column and beam or post and beam combinations) and walls	<input type="radio"/> Yes <input checked="" type="radio"/> No	10	0
• Roof assemblies	<input type="radio"/> Yes <input checked="" type="radio"/> No	10	0
• Other envelope assembly materials (cladding, windows etc.)	<input type="radio"/> Yes <input checked="" type="radio"/> No	5	0
Specify: n/a		0	0
Materials that minimize consumption of resources		16	16
Will used building materials and components be integrated in construction?	<input checked="" type="radio"/> Yes <input type="radio"/> No	2	2
Describe the types and quantities of used materials that will be integrated:	Carpet tiles, light fixtures	2	2

Case Study - Resources

Will building materials with recycled content be used in construction?	<input checked="" type="radio"/> Yes <input type="radio"/> No	2	2
Describe the types and quantities of recycled materials that will be integrated:	Recycled steel for structure, Recycled blast furnace slag in the concrete foundation and sidewalks. Recycled aluminum in curtainwall system	2	2
Are materials from renewable sources and/or locally manufactured materials specified and have these undergone a life-cycle assessment?	<input checked="" type="radio"/> Yes <input type="radio"/> No	2	2
Describe the materials that will come from renewable or locally manufactured sources:	see LEED template Certified woods, Regional materials and Recycled content	2	2
Do the construction documents specify that tropical hardwoods will not be used and that solid lumber and timber panel products will originate from certified and sustainable sources (i.e. Sustainable Forestry Initiative, CSA,	<input checked="" type="radio"/> Yes <input type="radio"/> No	4	4
Reuse of existing buildings		0	0
	<input type="radio"/> Less than 50% <input type="radio"/> At least 50% <input type="radio"/> At least 75% <input type="radio"/> 100% of existing facades in fully renovated buildings		
Do the construction documents indicate that the design includes existing facades in fully renovated buildings?	<input checked="" type="radio"/> N/A	0	0
Are 50% of the existing major structures (other than the shell) being reused?	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A	0	0

Case Study - Resources

Building durability, adaptability and disassembly		14	9
Are durable and low maintenance building materials and assemblies specified? <input checked="" type="radio"/> Yes <input type="radio"/> No		2	2
Describe the materials and assemblies that have been specified for their durability and low maintenance:	Brick facade, metal roofing high performance membrane roofing system, high performance curtainwall system.	2	2
Do the construction documents indicate that the design promotes building adaptability? <input type="radio"/> Yes <input checked="" type="radio"/> No		2	0
Describe the main features that promote building adaptability:		n/a	3
Does the design indicate that materials and fastening systems will allow for easy disassembly?		<input checked="" type="radio"/> Yes <input type="radio"/> No	2
Describe the features that allow disassembly:	Brick siding can be reused, the steel structure can be recycled, the concrete can recycled		3
Reuse and recycling of construction/demolition waste			5
Is there a construction, demolition and renovation waste management plan?		<input checked="" type="radio"/> Yes <input type="radio"/> No	5
Facilities for recycling and composting			10
Do the construction documents indicate that adequate waste handling and storage facilities for recycling and composting are provided?		<input checked="" type="radio"/> Yes <input type="radio"/> No	5
Indicate how much storage area will be provided for storing recyclable waste:	120 ft ²		5

Case Study – Emissions & Effluents

EMISSIONS, EFFLUENTS AND OTHER IMPACTS

Question	Answer	Applicable	Scored
Minimization of air emissions		15	0
Are low-NOx boilers and furnaces specified? <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> N/A		10	0
Heat Input: <input type="text" value="0"/> BTU/hour		3	0
Emissions: <input type="text" value="0"/> <input checked="" type="radio"/> lb/MBtu <input type="radio"/> ppm		2	0
Minimization of ozone depletion		25	15
Are refrigeration systems specified that avoid the use of ozone-depleting substances (ODS) and potent industrial greenhouse gases (PIGGs) in the cooling systems?	<input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> There are no refrigerants <input type="radio"/> Retro-fit		
Indicate which refrigerant is specified:	<input type="text" value="n/a"/>		

Case Study – Emissions & Effluents

In the case of a new building or a retro-fit, where CFC (chlorofluorocarbon), HFC (hydrofluorocarbon) or HCFC (hydrochlorofluorocarbon) refrigerants are specified, what will be their ozone-depleting potential (ODP)?	<input type="radio"/> Higher than 0.05 <input checked="" type="radio"/> Less than 0.05 <input type="radio"/> Equal to 0	20	10
Do the construction documents indicate that the building's air-conditioning system complies with the requirements of ASHRAE 15 -1994?	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A	5	5
Avoiding contamination of sewers or waterways		5	0
Are there measures to intercept and/or treat contaminated water to prevent contaminants from entering sewers or waterways?	<input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> N/A	3	0
Briefly describe measures:	n/a	2	0
Pollution minimization		20	20
Compliant storage tanks			
Do the construction documents indicate that soil and surface water contamination will be prevented, in compliance with the federal and state regulations?	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A	0	0

Case Study – Emissions & Effluents

Control other pollutants (PCBs, asbestos, radon)			
In the case of a retro-fit, do all PCBs present in the building meet applicable regulatory requirements?	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A	0	0
In the case of a retrofit, do the construction documents require that the removal or abatement of asbestos and asbestos-containing materials meet all applicable state and local regulations?	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A	0	0
Do the design and construction documents include measures appropriate to the region to prevent the accumulation of harmful chemicals and gases such as radon and methane in spaces below the substructure, and their penetration into the building?	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A	0	0
Integrated pest management			
Do the construction documents specify components, materials and the protection of structural openings to avoid infestation by pests?	<input checked="" type="radio"/> Yes <input type="radio"/> No	10	10
Storage and control of hazardous materials			
Do the construction documents include secure, appropriately-ventilated storage areas for hazardous and flammable materials?	<input checked="" type="radio"/> Yes <input type="radio"/> No	10	10

Case Study – Indoor Environment

INDOOR ENVIRONMENT

Rating Earned: 79%

Applicable Score

185 147

Question	Answer	Applicable	Score
Ventilation		50	37
Will the ventilation system be designed with the following features to avoid entraining pollutants into the ventilation air path?			
• To avoid re-entrainment, air intakes and outlets will be positioned at least 30 ft apart, and inlets will not be downwind of outlets.	<input type="radio"/> Yes <input checked="" type="radio"/> No	3	0
• Air intakes will be located more than 60 ft from major sources of pollution and at least the minimum recommended distances from lesser sources of pollution.	<input type="radio"/> Yes <input checked="" type="radio"/> No	3	0
• Air intake openings will be suitably protected.	<input type="radio"/> Yes <input checked="" type="radio"/> No	2	0
• Ventilation lining that will avoid the release of pollution and fibers into the ventilation air path.	<input checked="" type="radio"/> Yes <input type="radio"/> No	2	2
Will sufficient ventilation be provided to obtain acceptable IAQ, in accordance with ANSI/ASHRAE 62.1-2004?	<input checked="" type="radio"/> Yes, using the <i>Ventilation Rate Procedure</i> <input type="radio"/> Yes, using the <i>Indoor Air Quality Procedure</i> <input type="radio"/> No	6	6
Indicate ventilation rate: <input type="text" value="20"/>	<input checked="" type="radio"/> cfm/person <input type="radio"/> cfm/ft ²	4	4

Case Study – Indoor Environment

Is there evidence that the mechanical systems will provide effective air exchange?	<input checked="" type="radio"/> Yes <input type="radio"/> No	5	5
Describe how ventilation effectiveness will be achieved:	The building is designed to be under negative pressure to provide effective ventilation	5	5
Will there be indoor air quality monitoring?	<input checked="" type="radio"/> Yes, using CO ₂ monitoring <input type="radio"/> Yes, using digital electronic airflow monitoring <input type="radio"/> No <input type="radio"/> N/A	5	5
Will the mechanical ventilation system have the capability of flushing-out the building with 100% outside air at ambient temperatures above 32°F?	<input checked="" type="radio"/> Yes <input type="radio"/> No	5	5
Will enclosed parking areas be mechanically ventilated?	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A	0	0
Do the construction documents specify personal controls over the ventilation rates, or, in naturally ventilated buildings, operable windows or trickle vents on windows?	<input type="radio"/> Yes <input checked="" type="radio"/> No	3	0
Describe personal controls:	n/a	2	0
Do the construction documents specify a Minimum Efficiency Reporting Value (MERV) of at least 13 (80-90% Dust Spot Efficiency) for air distributed to occupied spaces?	<input checked="" type="radio"/> Yes <input type="radio"/> No	5	5

Case Study – Indoor Environment

Question	Answer	Applicable	Scored
Source control of indoor pollutants		40	33
Are measures specified to prevent the growth of fungus, mold, and bacteria on building surfaces and in concealed spaces?	<input checked="" type="radio"/> Yes <input type="radio"/> No	5	5
Describe measures to prevent mold:	There was an IAQ construction management plan implemented during construction. Some measures included vacuuming of wall cavities prior to enclosure, insulation was stored and installed after shell was water tight, Duct work was sealed when delivered to site and installed duct work was sealed at the end of each day or when a potential contamination situation was present.	5	5
Are measures specified to ensure easy access to the air-handling units (AHUs), facilitating their drainage and preventing the accumulation of debris?	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A	5	5
Do the construction documents specify the use of humidifiers that are designed to avoid the growth of microorganisms?	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A	3	3
Describe humidification system:		n/a	2
Do the construction documents specify CO monitoring in parking garages?	<input type="radio"/> Yes <input type="radio"/> No	0	0

Case Study – Indoor Environment

Do the construction documents indicate measures to mitigate indoor pollution at-source?	<input checked="" type="radio"/> Yes <input type="radio"/> No	2	2
Describe measures to mitigate indoor pollution at source:	Walk off mats at entries, Janitor's closet are separately vented	3	3
Do the construction documents indicate that wet cooling towers are designed and located in such a way as to avoid the risk of Legionella?	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A	0	0
Do the construction documents demonstrate that the domestic hot water system is designed to prevent the occurrence of Legionella?	<input type="radio"/> Yes <input checked="" type="radio"/> No	5	0
Do the construction documents specify interior materials that are low-VOC emitting, non-toxic, and chemically inert?	<input checked="" type="radio"/> Yes <input type="radio"/> No	5	5
Describe some of the specified materials with these qualities:	Adhesives and sealants meet south Coast Air Quality Management District Rule# 1168 for VOC compliance, Paints and coatings meet Green Seal standard GS-11, composite woods have no added ureaformaldehyde resins	5	5

Case Study – Indoor Environment

Daylighting

Do the construction documents show that the building provides ambient daylight to 80% of the primary spaces?	<input checked="" type="radio"/> Yes <input type="radio"/> No	5	5
Will the building achieve a minimum daylight factor of 0.2 for a partially lit work place or living/dining area, or 0.5 for a well day-lit work area?	<input type="radio"/> Yes <input checked="" type="radio"/> No	2	0
Indicate daylight factor: <input type="text" value="0"/>		3	0
Are there views to the building exterior, or to atria from all primary interior spaces?	<input checked="" type="radio"/> Yes <input type="radio"/> No	5	5
Do the construction documents specify solar shading devices to enable occupants to control brightness from direct daylighting?	<input checked="" type="radio"/> Yes <input type="radio"/> No	5	5
Lighting Design			
Do the construction documents show that the building provides light levels no less than those recommended in <i>IESNA Lighting Handbook, 2000</i>, for the types of tasks that are anticipated in the various building spaces (regardless of the amount of natural light)?	<input checked="" type="radio"/> Yes <input type="radio"/> No	10	10
Do the construction documents show that there are measures to avoid excessive direct or reflected glare, as per <i>IESNA RP-5, 1999, Recommended Practice of Daylighting?</i>	<input type="radio"/> Yes <input checked="" type="radio"/> No	5	0
Are local lighting controls specified that relate to room occupancy, circulation space, daylighting and the number of workstations in office areas?	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A	10	10

Case Study – Indoor Environment

Thermal comfort		20	20
Does the building design conform to the <i>ASHRAE 55-2004</i> for thermal comfort?	<input checked="" type="radio"/> Yes <input type="radio"/> No	20	20
Acoustic comfort		30	22
Is the building sited, and are spaces within the building zoned so as to provide optimum protection from undesirable outside noise, and fall within acceptable noise criteria (NC) ranges?	<input type="radio"/> Yes <input checked="" type="radio"/> No	5	0
Do the construction documents specify the sound level transmission through the building envelope?	<input checked="" type="radio"/> Yes <input type="radio"/> No	2	2
Indicate the sound transmission class (STC) rating of the walls: <input type="text" value="66"/>		3	3
Do the construction documents include noise attenuation of the structural systems, and measures to insulate primary spaces from impact noise?	<input checked="" type="radio"/> Yes <input type="radio"/> No	2	2

Case Study – Indoor Environment

Do the construction documents include noise attenuation of the structural systems, and measures to insulate primary spaces from impact noise?	<input checked="" type="radio"/> Yes <input type="radio"/> No	2	2
Indicate the Field Input Insulation Class (FIIC) value: <input type="text" value="0"/>		3	0
Does the design provide acoustic controls to meet the acoustic privacy requirements?	<input checked="" type="radio"/> Yes <input type="radio"/> No	2	2
Describe how is acoustic control provided: sound attenuation insulation in the wall cavity, acoustic ceiling tile, carpet system.		3	3
Does the interior design meet speech intelligibility requirements for the various spaces and activities?	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A	5	5
Does the design include measures to mitigate acoustic problems associated with mechanical equipment and plumbing systems?	<input checked="" type="radio"/> Yes <input type="radio"/> No	5	5

QUESTIONS?