

E. Resources, Building Materials and Solid Waste (100 points)

E.1 Materials with low environmental impact (40 points)

Objectives:

- Select environmentally preferable products and materials with the lowest life cycle environmental burden and embodied energy.
- Encourage the designer to consider relative environmental merits of products and materials.

E.1.1 (Educational criteria) Have the following assemblies been selected based on a life cycle assessment of their embodied energy, and green house gas emissions using the ATHENA “Environmental Impact Estimator” or NIST BEES?	
Foundation and floor assembly materials	10 points
Structural systems (column and beam or post and beam combinations) and walls	10 points
Roof assemblies	10 points
Other envelope assembly materials (cladding, windows, etc.) Describe _____	10 points

Final verification: Review whether a life cycle assessment has been done for the building materials and assemblies used in foundations, floor, structural system, roof and envelope assembly. The LCA assessment should have been conducted through use of assessment tools such as the Athena Institute *Environmental Impact Estimator* in the schematic design stage, or NIST *BEES* at the construction documents stage.

E.2 Minimized consumption and depletion of material resources (30 points)

Objective: Conserve resources and minimize the energy and environmental impact of extracting and processing non-renewable materials.

E.2.1 What proportion of building materials and components are re-used?	Points are awarded where 1-10 % or more of materials used are “re-used”. The Green Globes system will calculate this based on the percentage cost of re-used materials versus the total cost of materials. Maximum points = 10 points	
	Cost of materials displaced by the re-used materials	Total Cost (new and re-used)
Flooring		
Paneling		

Fixtures and cabinetry		
Thermal Insulation		
Asphalt Paving		
Concrete		
Steel		
Large-dimension structural lumber (beams & posts)		
Sheet metal		
Bricks		
Doors and frames		
Windows		
Others - describe		
Total:		
Provide references to specifications. _____		

Verification: Review specifications for re-used materials.

Final verification: Review bills showing how much re-used material was purchased.

E.2.2 What proportion of building materials contain recycled post-consumer content?	Points are awarded where 1-20% or more of the materials contain recycled content. The Green Globes system will calculate points awarded based on the percentage cost of recycled materials versus the total cost of materials. Maximum points = 10 points	
<i>Federal Recommended Recycled Content for Products Guidelines and EPA's List of Designated Products at minimum</i>		
	Cost of post-consumer and post-industrial recycled materials	Total Cost (new and post-consumer recycled materials)
Thermal insulation		
Carpet		
Concrete		
Asphalt		
Gypboard		
Floor tiles		
Patio blocks		
Roofing materials		
Metals		
Others - describe		
Total:		
Provide references to specifications. _____		

Verification: Review cut sheets for recycled content. Review letters from manufacturers declaring recycled content.

Final verification: Review bills showing how much material was purchased that contains post-consumer recycled content.

E.2.3 What proportion of materials are bio-based products, such as green insulation, natural fibers and natural structural materials?	Points are awarded where 1-20% or more of materials used are bio-based. The Green Globes system will calculate points awarded based on the percentage cost of bio-based materials versus the total cost of materials. Maximum points = 5 points
Total cost of materials	Total cost of bio-based materials
Describe the bio-based products. _____	
Provide references to specifications. _____	

Verification: Review specifications for bio-based products and materials.

Final verification: Review bills showing how much bio-based material was purchased.

E.2.4 What proportion of solid lumber and timber panel products originate from sustainable sources that are third-party certified by the Sustainable Forestry Initiative (SFI), CSA Sustainable Forest Management (SFM), Forestry Stewardship Council (FSC), or American Tree Farm System (AFS)?	Points are awarded where 1-100% of the wood used comes from third-party certified acreage. The Green Globes system will calculate points awarded based on the percentage cost of certified wood products versus the total cost of wood products. Maximum points = 5 points
Total cost of wood	Cost of certified wood
Provide references to specifications. _____	

Verification: Review cut sheets for wood that meets third-party certified wood standards, such as SFI (Sustainable Forestry Initiative), SFC (Sustainable Forestry Council), CSA sustainable forest management (SFM), and AFS (American Tree Farm System.)

Final verification: Review evidence that the wood used was certified to third party standards.

E.3 Re-use of existing structures (10 points)

Objective: Conserve resources and minimize the energy and environmental impacts of extracting/harvesting and processing resources.

E.3.1 Where there is an existing structure on the site, what proportion of its facades are integrated in the new building? Mark "not applicable" if there is no existing building or where the existing building is less than 1000 square feet.	Points are awarded where 1-100% of existing facades are integrated in the project. The Green Globes system will calculate points awarded based on the percentage of façade retained. Maximum points = 5 points
Total existing building façade area	Area of façade retained

Provide drawing references. _____	

Verification: Review drawings (elevations).

Final verification: Conduct a visual verification.

<p>E.3.2 What proportion of the volume of existing structure (i.e. external walls and floors) is re-used in the new design? Mark “not applicable” if there is no existing building or where the existing building is less than 1000 square feet.</p>	<p>Points are awarded where a design allows 10-100% re-use of an existing major structure by gross building volume, provided that the volume of the existing structure has a reasonable preservation value and is at least 10% of the volume of the new design. The Green Globes system will calculate points awarded based on the stated percentage.</p> <p>Maximum number of points = 5 points</p>
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<p>Total volume of the re-used existing structure</p>	<p>Total volume of the existing structure</p>

Provide drawing references. _____

Final verification: Review construction plans, sections and elevations showing the incorporation of the re-used existing structure.

E.4 Building durability, adaptability and disassembly (12 points)

Objective: Extend the life of a building and its components, and conserve resources by minimizing the need to replace materials and assemblies.

<p>E.4.1 Does the envelope design meet regional best practices to control rain penetration? (i.e. are there specific measures such as overhangs, flashings, drainage planes that overlap flashing slopes, appropriately located and sized weep-holes)?</p>	<p>2 points.</p>
<p>What is the general strategy to control rain penetration? Select applicable.</p> <p style="padding-left: 40px;"> screened-drained system perfect barrier system storage system </p> <p>Describe specific measures. _____</p> <p>Provide references to drawings and specifications. _____</p>	

Final verification: Review architectural drawings and details to verify that there are measures to control rain penetration in the building envelope, such as overhangs, flashings, drainage planes that overlap, flashing slopes, appropriately located and sized weep-holes. Check that mock-ups have been constructed and testing was undertaken to ensure that there will be no damage to the fabric as a result of rain penetration. Verify that the building areas particularly prone to rain damage are properly protected (e.g. the upper building edges, parapet and cornices, that are most prone to wetting are protected from water damage.)

E.4.2 Are there measures to control entry of groundwater (e.g. slope, damp proofing membrane, weeping tiles, and drainage along foundations.)	2 points
Describe the measures to avoid penetration of groundwater. ____ Provide references to drawings and specifications. _____	

Final verification: Review civil engineering drawings to verify that there are measures to control ground water penetration such as slope, damp proofing membrane, weeping tiles granular capillary break and drainage along foundations. A visual verification will be conducted.

E.4.3 Does the design promote building adaptability in terms of the following? Select applicable. <i>ASTM E06.25 Standards on Whole Building Functionality and Serviceability</i>	
• Light fixtures are integrated with the planning grid, or uplighting is used rather than ceiling mounted lights, thereby avoiding the need to relocate ceiling light fixtures.	.5 point
Provide drawing references. _____	
• Air diffusers are on flexible ducts that can be relocated at minimum cost and with only a few minutes of disruption to the occupants.	.5 point
Provide drawing references. _____	
There are raised floors.	.5 point
Provide drawing references. _____	
• Air exhaust ducts are flexible and easy to connect, and space and capacity are available in ceiling and duct shafts to install special exhaust.	.5 point
Provide drawing references. _____	
• Cable/data is pre-wired in fixed locations and therefore does not require a technician for minor adjustments.	.5 point
Provide drawing references. _____	
• Floor-to-ceiling partition walls are easily removed and fully salvageable and can be relocated without damaging the flooring and with only minor damage to the ceiling.	.5 point
Provide drawing references. _____	

Verification: Review drawings to check that

- Light fixtures are integrated with the planning grid, or uplighting is used rather than ceiling mounted lights, thereby avoiding the need to relocate ceiling light fixtures.
- Air diffusers are on flexible ducts that can be relocated at minimum cost and with only a few minutes of disruption to the occupants.
- There are raised floors.

- Air exhaust ducts are flexible and easy to connect, and space and capacity are available in ceiling and duct shafts for exhaust shafts for special exhaust.
- Cable/data is pre-wired in fixed locations and therefore does not require a technician for minor adjustments.
- Floor-to-ceiling partition walls are easily removed and fully salvageable and can be relocated without damaging the flooring and with only minor damage to the ceiling.

Final verification: Conduct a visual verification.

<p>E. 4.4 What proportion of the following materials are of standard size and fastened using fastening systems that allow for easy disassembly?</p>	<p>Points are awarded where 1 - 50% of the elements of the building can be disassembled. The Green Globes system will calculate points awarded based on the stated percentage. Maximum total points = 3 points</p>	
<p>Indicate the type and quantity (% of the total volume) of construction materials that can be disassembled.</p>		
	<p>Total volume</p>	<p>Volume that can be disassembled for re-use</p>
<p>Masonry</p>		
<p>Wood / timber</p>		
<p>Insulation</p>		
<p>Finishes</p>		
<p>Specialty materials</p>		
<p>Mechanical</p>		
<p>Plumbing & electrical</p>		
<p>Others _____</p>		
<p>Provide references to specifications. _____</p>		

Final verification: Review the specifications and drawings to verify that structural, cladding and detailing materials, and fastening systems facilitate building disassembly. Check for the use of standard sized construction materials, and the minimal use of adhesives, to promote re-use.

E.5 Reduction, re-use and recycling of waste (10 points)

Objective: Divert demolition waste from landfill and reduce landfill waste generated by occupants.

<p>E.5.1 What proportion by weight of construction, demolition and renovation waste is diverted from landfill?</p>	<p>Points are awarded where 1-100% of waste is diverted. The Green Globes system will calculate points awarded based on the stated percentage. Maximum points =6</p>	
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Total waste (weight)	Waste to landfill (weight)

Provide records of waste hauls and type. _____

Verification: Review relevant sections of Division 1 and 2 of the specifications (particularly sections 01351 and 01355, Waste Management and Disposal), stating the project's environmental goals and procedures regarding the development of a Construction Waste Recycling Program to recycle as much of the construction waste as possible. The specifications should either identify a separate contractor to remove reusable items, or require the demolition contractor to remove items for recycling and recovery.

Final verification: Review the Construction, Demolition and Renovation Waste Reduction Plan and the total amount of waste sent to the landfill. Review final records of waste hauls and types.

E.5.2 For every 10,000 square feet of occupied space, are there at least 20 square feet of designated storage space for recyclable waste or 100 square feet for buildings with more than 50,000 square feet of occupied floor space?	3 points
E.5.3 Is there space for a recycling dumpster next to the general waste dumpster?	1 point
<p>Indicate how much storage area will be provided for storing recyclable waste. ___square feet</p> <p>Provide drawing references. _____</p>	

Verification: Review drawings to check that there is the required amount of space for a recycling dumpster.

Final verification: Conduct a visual verification.