

# UBC Residential Environmental Assessment Program

## REAP 3.0

### Project Information

Developer: The Wall Group  
 Architect: Perkins+Will  
 REAP consultant E3 Eco Group Inc.  
 Project Name: Ivy On The Park  
 Neighbourhood: Wesbrook Village  
 Lot No.: 8  
 Street Address: -  
 Project Stage: Building Permit  
 UBC DP Reference No.:  
 Date:

<b>CREDITS</b>	Mandatory	Max	Score
Sustainable Sites (SS)	complete	10	8
Water Efficiency (WE)	complete	18	9
Energy & Atmosphere (EA)	complete	52	26
Materials & Resources (MR)	N/A	18	3
Indoor Environmental Quality (IEQ)	complete	8	6
Construction (CON)	complete	4	2
Innovation & Design Process (ID)	complete	24	9
<b>Subtotal</b>		<b>134</b>	<b>63</b>
<b>TOTAL</b>		<b>134</b>	<b>63</b>

<b>REAP Rating:</b>	<b>GOLD PLUS (61 – 75 pts)</b>
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45-60 pts	Gold
61-75 pts	Gold Plus
76-100pts	Platinum
101-134 pts	Platinum Plus

**Performance Category: Sustainable Sites (SS)**

**10 Points**

The intent of the Sustainable Sites category is to reduce the negative impacts of development, maintain the natural landscape, vegetation and environmental attributes of the site and

**Score: 8** Mandatory points achieved

SS		MANDATORY		
SS	M1	<b>Storm Water Management Plan</b> Develop a plan that integrates the on-site stormwater management system with the neighbourhood-wide stormwater management principles and strategies, including controlling of rate and/or quantity of run-off as required.	M	M
SS	M2	<b>Adapted and Ecologically Sound Planting</b> Demonstrate that landscape design has minimized the need for pesticides and irrigation through the selection of adaptive and drought-tolerant plants and consideration of the principles of Integrated Pest Management and xeriscaping.	M	M
SS	M3	<b>Bicycle Storage</b> Provide covered storage facilities for securing bicycles in accordance with the UBC Development Handbook.	M	M
SS	M4	<b>Contribution to Community Car Sharing</b> Contribute to the development of a community car-sharing network by funding the equivalent of one community vehicle per 100 residential units.	M	M
SS	M5	<b>Light Pollution Reduction</b> Do not exceed Illuminating Engineering Society of North America (IESNA) illuminance requirements as stated in the Recommended Practice Manual: Lighting for Exterior Environments.	M	M
SS	M6	<b>Recycling Collection</b> Provide for collection of domestic paper, plastic, glass and metal recyclables by contracting with a waste management company for the service. Recycling storage space shall be designed in accordance with Metro Vancouver's Technical Specifications for Recycling Amenities.	M	M
SS	M7	<b>Compost Collection</b> Provide a space in the building for the collection compost and provide for the compost collection through a contract with UBC Waste Management or another waste management service provider. Design the space in the building in accordance with Metro Vancouver's Technical Specifications for Recycling Amenities.	M	M
SS		<b>OPTIONAL</b>		
SS	1.1	<b>In-Suite Recycling and Compost Separation</b> Provide a space and system for simplified separation and collection of recycling and compostables in each suite or unit.	2	2
SS		<b>2 ALTERNATIVE TRANSPORTATION</b>		
	2.1	<b>Additional Bicycle Facilities</b> In addition to the requirements for bicycle parking in the UBC Development Handbook, provide an additional 0.25 Class I bicycle storage/bedroom and a bicycle repair station within the building.	2	0
	2.2	<b>Electric Vehicle Charging – Visitor</b> Provide one dedicated parking spot per 100 residential units for visitors of residents/owners, fully equipped with Level 2 charging station.	2	2
	2.3	<b>Electric Vehicle Charging - Resident</b> Install necessary conduit and transformer capacity to accommodate Level 2 Charging Stations for the following percentage of owners'/residents' parking (Max = 4 Points): □ 10% of owners'/residents' parking – 2 Points □ 20% of owners'/residents' parking – 2 Points	4	4

**Performance Category: Water Performance Category: Water Efficiency (WE) 18 Points**

The intent of the Water Efficiency category is to encourage strategies that reduce the amount of potable water used for landscape irrigation and building operations.

**Score: 9**

Mandatory points achieved

WE		MANDATORY		
WE	M1	<b>Efficient Irrigation Technology and Rainwater Use</b> Design and install a water-efficient irrigation system that includes an automated controller, rain or soil sensors and pressure regulator and for non-grass areas use a micro- or drip-feed irrigation or install a temporary irrigation system.	M	M
	M2	<b>Low-Flush Toilets</b> Specify and install high efficiency 4.8 L per flush (1.28 gal) single flush toilets or 3.4/6 L per flush (0.9gal/1.6gal) dual flush toilets for all water closets.	M	M
	M3	<b>Low-Flow Faucet Aerators</b> Specify and install low-flow faucets with aerators in all bathroom sinks (max. 3.8 L per minute) and in all kitchen sinks (max. 6.8 L per minute).	M	M
	M4	<b>Low-Flow Showerheads</b> Specify and install water-saving showerheads with a maximum flow rate of 8.5 L per minute in each shower.	M	M
	M5	<b>Energy Star Clothes Washers and Dishwashers</b> Specify and install Energy Star-labelled clothes washers and dishwashers in each unit, or specify and offer only Energy Star models if these appliances are optional.	M	M
WE		OPTIONAL		
WE	1	<b>WATER EFFICIENT LANDSCAPING</b>		
	1.1	<b>Reduce Potable Water Use</b> Reduce potable water use for site irrigation needs by 50% from the calculated mid-summer baseline.	3	3
	1.2	<b>Eliminate Potable Water Use</b> Eliminate potable water use for site irrigation needs.	3	0
WE	2	<b>WATER USE REDUCTION</b>		
	2.1	<b>Low-Flow Showerheads</b> Specify and install water-saving showerheads (maximum of 5.7 L per minute) in each shower	2	2
	2.2	<b>Water Efficient Dishwasher</b> Specify and install water-efficient dishwashers that use ≤ 11 L (2.91 gal) per normal wash cycle or if dishwashers are available only as an option, specify and offer only models complying with this credit.	1	1
	2.3	<b>Most Efficient Clothes Washers</b> Specify and install Energy Star clothes washers listed as "Most Efficient" for current year, or if washers are available only as an option, specify and offer only models complying to this standard.	2	0
	2.4	<b>Water Use Reduction Package</b> Additional credit for achieving credits: WE 1.1, WE 2.1, WE 2.2 and WE 2.3.	2	0
WE	3	<b>WATER METERING</b>		
	3.1	<b>Domestic Hot Water metering</b> In units with central hot water, provide individual hot water metering.	3	3
	3.2	<b>Domestic Cold-Water metering</b> Provide for individual cold water meters for all units.	2	0

**Performance Category: Energy & Atmosphere (EA)**

**50 Points**

The intention of the energy and atmosphere category are to reduce depletion of non-renewable energy resources and to reduce the environmental impacts of energy use, particularly emissions of local, regional and global air pollutants and greenhouse gases.

**Score: 26**

Mandatory points achieved

EA		MANDATORY		
EA	M1	<b>Minimum Roof Insulation</b> Design the roof assembly with a minimum insulation value of R-40 h-ft <sup>2</sup> ·°F/Btu (7.04 °K-m <sup>2</sup> /W) for buildings with attic space and R-28 h-ft <sup>2</sup> ·°F/Btu (4.93 °K-m <sup>2</sup> /W) for cathedral ceilings/flat roofs.	M	M
	M2	<b>Minimum Exterior Wall Insulation</b> Design the exterior insulated wall area with a minimum thermal resistance of effective (overall) R-15.6 h-ft <sup>2</sup> ·°F/Btu (2.75 °K-m <sup>2</sup> /W) for above grade non-glazed wall areas, and R-7.5 h-ft <sup>2</sup> ·°F/Btu (1.32 °K-m <sup>2</sup> /W) "continuous insulation" for below grade walls.	M	M
	M3	<b>Minimum Floor Insulation</b> Design floors above non-heated parkade areas with a minimum insulation value of R-30 h-ft <sup>2</sup> ·°F/Btu (5.28 °K-m <sup>2</sup> /W) for framed floors and R-15.6 h-ft <sup>2</sup> ·°F/Btu (2.75 °K-m <sup>2</sup> /W) for slab floors.	M	M
	M4	<b>Energy Efficient Windows</b> Specify and install Energy Star-rated windows or windows with a maximum overall U-value of 0.35 Btu/hr-ft <sup>2</sup> ·°F (2.0 W/m <sup>2</sup> ·°K) for non-metal framed windows or a maximum overall U-value of 0.45 Btu/hr-ft <sup>2</sup> ·°F (2.55 W/m <sup>2</sup> ·°K) for metal framed windows.	M	M
	M5	<b>Minimum Boiler Efficiency</b> Specify and install boilers with a minimum thermal efficiency of 84% /AFUE of minimum 90% or heat using District Energy.	M	M
	M6	<b>Domestic Hot Water</b> Specify and install gas DHW boilers with a minimum efficiency of 84% (mid-efficiency boiler) or heat domestic hot water using District Energy.	M	M
	M7	<b>Energy Star Dishwashers and Refrigerators</b> Specify and install Energy Star-labelled dishwashers and refrigerators in each unit.	M	M
	M8	<b>Programmable Thermostats</b> Specify and install programmable thermostats for at least the largest heating zone in each unit.	M	M
	M9	<b>Common Area Lighting</b> Specify and install only non-incandescent lighting, such as fluorescent, compact fluorescent or LED, in common areas.	M	M
	M10	<b>Parkade and Corridor Lighting Controls</b> Specify and install parkade and corridor lighting controls to automatically reduce the overall lighting level by at least 30% in a lighting zone when the zone is unoccupied.	M	M
EA	<b>MANDATORY</b>			
	<b>ENERGY EFFICIENCY TARGETS</b>			
		<b>EA GOLD-Mandatory</b> Design the building to meet a maximum EUI of 160 kwh/m <sup>2</sup> /yr, demonstrated using the UBC Energy Modeling Guidelines. This credit is mandatory and required for achievement of REAP Gold.	6	6
		<b>EA Gold Plus</b> Design the building to meet a maximum EUI of 140 kwh/m <sup>2</sup> /yr, demonstrated using the UBC Energy Modeling Guidelines. This credit is mandatory and required for achievement of REAP Gold Plus.	8	8
		<b>EA Platinum</b> Design the building to meet a maximum EUI of 120 kwh/m <sup>2</sup> /yr, demonstrated using the UBC Energy Modeling Guidelines. This credit is mandatory and required for achievement of REAP Platinum.	10	0
		<b>EA Platinum Plus</b> Design the building to meet a maximum EUI of 105 kwh/m <sup>2</sup> /yr, demonstrated using the UBC Energy Modeling Guidelines. This credit is mandatory and required for achievement of REAP Platinum Plus.	10	0
EA	1	<b>ENERGY METERING</b>		
	1.1	<b>Thermal Energy Sub-Metering</b> Provide separate metering in individual units for measuring thermal energy consumption used for space heating.	1	0

EA	2	<b>RENEWABLE ENERGY</b>			
	2.1	<b>Future Renewable Electricity</b> Pre-wire buildings and provide installation space for future use of photovoltaic technologies or other renewable electricity generation.	1	1	
	2.1	<b>Renewable Electricity Utilization</b> Utilize photovoltaic technologies or other renewable electricity generation for a portion of the building's electrical supply	3	0	
	2.3	<b>Low-Carbon District Energy Utilization</b> Utilize low carbon, renewable energy through connect to the District Energy System for the building's thermal energy supply (or be District Energy compatible).	5	5	
EA	3	<b>COMMISSIONING</b>			
	3.1	<b>Commissioning</b> Contract a third party Commissioning Authority to develop and implement a commissioning plan for all major building energy systems and verify they are installed, calibrated and perform according to design intent.	4	4	
EA	4	<b>AIRTIGHTNESS</b>			
	4.1	<b>Airtightness</b> The building envelope shall be constructed so that the air change rate is not greater than 3.5ACH50 when measured in accordance with CAN/CGSB-149.15-M86 (Determination of the airtightness of Building envelopes by the Fan Depressurization Method.)	2	0	
EA	5	<b>ENERGY MODELLING WORKSHOP</b>			
	5.1	<b>Energy Modelling Workshop</b> Model the energy performance of the building and hold a workshop with the design team, a representative from Campus sustainability and contractor to evaluate the results and optimize the design of the building.	2	2	
<b>Performance Category: Materials &amp; Resources (MR)</b>			<b>18</b>	<b>Points</b>	
The intent of the Materials & Resources category is to encourage design strategies that reduce and reuse material resources, reduce construction waste, and to select building materials that are environmentally preferable.					

**Score: 3**                      No Mandatory Items

MR		<b>OPTIONAL</b>			
MR	1	<b>RECYCLED CONTENT AND REUSED MATERIALS</b>			
	1.1	<b>Reused Building Materials</b> Use salvaged, refurbished, or reused materials for at least 5% of the total cost of building materials.	2	0	
	1.2	<b>Reused Building Materials</b> Use salvaged, refurbished, or reused materials for at least 10% of the total cost of building materials.	2	0	
	1.3	<b>Recycled Content Materials</b> Specify and use building materials with the following recycled content levels: <i>Common area carpet with minimum 25% recycled content</i> <i>Drywall with minimum 15% recycled content</i> <i>Batt insulation with minimum 40% recycled content</i> <i>Doors contain minimum 15% recycled material</i> <i>Concrete with min. 20% fly ash content, excluding suspended slabs</i> <i>Concrete with min. 40% fly ash content, excluding suspended slabs</i> <i>Cabinetry with minimum 20% recycled content</i> <i>MDF products with minimum 50% recycled content</i> Minimum four recycled content items on list above    1 point All eight recycled content items on list above    2 points	2	1	Y Y Y Y N N N Y
MR	2	<b>REGIONAL MATERIALS</b>			
	2.1	<b>Regionally Manufactured Building Materials</b> Use a minimum of 20% (by value) of building materials and products that are manufactured within a radius of 800 km (500 miles).	1	0	
	2.2	<b>Regionally Sourced Building Materials</b> Of the materials from Credit MR 2.1, use a minimum of 50% (by value) of building materials and products that are extracted, harvested or recovered (as well as manufactured) within a radius of 800 km (500 miles).	1	0	
MR	3	<b>CERTIFIED AND NON-ENDANGERED FOREST PRODUCTS</b>			
	3.1	<b>Dimensional Lumber</b> Demonstrate that a minimum of 50% of the total value of dimensional lumber and plywood is certified in accordance with either: CSA Z809 – 2 Points Or Forest Stewardship Council (FSC) – 3 Points	3	0	

	3.2	<b>Or Forest Stewardship Council (FSC) 3 points</b> Specify and install bamboo floors or hardwood floors certified in accordance with the Forest Stewardship Council or CSA Z809. If floors are offered only as an option, specify and offer only bamboo or renewable products with third-party certification. CSA Z809 – 2 Points Or Forest Stewardship Council (FSC) – 3 Points	3	0	
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<b>MR</b>	<b>4</b>	<b>BUILDING PRODUCT INGREDIENTS</b>			
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	4.1	<b>Transparency of Ingredients</b> Install ten different building products from three different manufacturers that demonstrate the chemical inventory of the product to and accuracy of 0.1% for each product. For each product selected provide either: Health Product Declaration Manufacturer Inventory of all ingredients by CAS number, of Declare Label (Living Building Institute)	2	2	
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	4.2	<b>Optimization of Ingredients</b> Demonstrate that a minimum of 10% (by value) of building materials are optimized for ingredient content by demonstrating optimization in one of the following ways: • GreenScreen v1.2 benchmark 4 minimum • Red List free • Free of ingredients listed on REACH Authorization and Candidate List	2	0	
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<b>Performance Category: Indoor Environmental Quality (IEQ)</b>			<b>8</b>	<b>Points</b>	
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The intent of the Indoor Environmental Quality category is to achieve enhanced indoor environmental quality through the thoughtful selection and application of materials and effective ventilation strategies.

**Score: 6** Mandatory points achieved

<b>IEQ</b>	<b>MANDATORY</b>				
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	M1	<b>Adhesives and Sealants</b> Specify and use adhesives, sealants and sealant primers that do not exceed the VOC limits of the Canadian Environmental Choice/EcoLogo program or do not exceed the VOC limits specified in the State of California's South Coast Air Management District Rule #1168.	M	M	
	M2	<b>Paints and Coatings</b> Specify and use paints and coatings that carry an EcoLogo label or those rated at a minimum GPI-1 by the Master Painter's Institute on the interior of the building.	M	M	
	M3	<b>Floor Coverings</b> Specify and install carpet and carpet cushion that carry the following certifications: Carpet and Rug Institute Green Label Plus or the Ecologo.	M	M	
	M4	<b>Ventilation Effectiveness</b> Prepare and implement an effective air management strategy that meets the requirements of the current versions of CAN/CSA F326 or ASHRAE-62.1 or 62.2 as applicable to the building configuration.	M	M	

<b>IEQ</b>	<b>OPTIONAL</b>				
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<b>IEQ</b>	<b>1</b>	<b>LOW-EMITTING MATERIALS</b>			
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	1.1	<b>Low VOC Paints and Coatings</b> Specify and use paints and coatings rated at a minimum GPS-2 by the Master Painter's Institute on the interior of the building.	2	2	
	1.2	<b>Low-Emitting Composite Wood Products</b> Specify and install interior composite wood products, such as flooring, doors, trim, etc., that have no added urea formaldehyde. Cabinetry is excluded from this credit.	2	2	
	1.3	<b>Low-Emitting Insulation</b> Specify and install formaldehyde-free insulation on the interior of the building.	2	2	
	1.4	<b>Low -Emitting Cabinetry</b> Specify and install interior cabinetry doors and boxes that are urea formaldehyde-free.	2	0	

<b>Performance Category: Construction (CON)</b>		<b>4 Points</b>	
The construction process can impose significant and lasting impact on the ecology of both the site and beyond. The Construction credits acknowledge and reward contractors who have followed best practices.			

Score: **2** Mandatory points achieved

CON		MANDATORY		
	<b>M1</b>	<b>Staging and Construction</b> Prepare and implement a staging and construction plan, including alternate detour information and signage for pedestrians and cyclists.	<b>M</b>	<b>M</b>
	<b>M2</b>	<b>Vegetation Safeguards and Land-Clearing Debris</b> Prepare a site plan showing the sizes and locations of vegetation to be removed, retained and salvaged, including plants located on adjacent public rights-of-way (see reference guide) and develop a plan to effectively handle debris from land clearing and divert it from landfill disposal.	<b>M</b>	<b>M</b>
	<b>M3</b>	<b>Truck Management Plan</b> Prepare and implement a comprehensive truck management plan for the project that conforms to the UBC Strategic Transportation Plan and the Neighbourhood Plan Development Guidelines.	<b>M</b>	<b>M</b>
	<b>M4</b>	<b>Wheel Wash</b> Provide a wheel wash for vehicles leaving the site or a street cleaning program and catch basin protection.	<b>M</b>	<b>M</b>
	<b>M5</b>	<b>Erosion and Sedimentation Control</b> Prepare and implement a site sediment and erosion control plan that conforms to Best Management Practices Guide for Stormwater: Appendix H – Construction Site Erosion and Sediment Control Guide (GVS&DD, October 1999).	<b>M</b>	<b>M</b>
	<b>M6</b>	<b>Waste Management Plan</b> Prepare and implement a waste management plan that diverts 75% (by weight) of construction, demolition and land clearing waste from landfill.	<b>M</b>	<b>M</b>
CON		OPTIONAL		
<b>CON</b>	<b>1</b>	<b>CONSTRUCTION IAQ MANAGEMENT PLAN</b>		
	<b>1.1</b>	<b>Indoor Air Quality Management Plan</b> Prepare and implement an Indoor Air Quality (IAQ) Management Plan for the construction and pre-occupancy phases of the building.	<b>2</b>	<b>2</b>
	<b>1.2</b>	<b>Flushout</b> Conduct a minimum two-week continuous building flushout with new filtration media at 100% outside air after construction ends and prior to occupancy or conduct a baseline indoor air quality test.	<b>2</b>	<b>0</b>

**Performance Category: Innovation & Design Process (ID)**

**24 Points**

The intent of the Innovation & Design Process category is to provide incentive and credit for general design and other innovative practices that improve the overall sustainability and

**Score: 9**

Mandatory points achieved

ID		MANDATORY			
	<b>M1</b>	<b>Goal-Setting Workshop</b> Hold a goal setting workshop including the developer, design consultants and contractor to review the Residential Environmental Assessment Program, set goals for the project and assign responsibilities.	<b>M</b>	<b>M</b>	
	<b>M2</b>	<b>Educate the Homeowner</b> Develop a homeowner's manual that promotes sustainable behavior and describes all of the sustainable features of the project instructing the homeowner on their proper use. This manual should be included in record drawings or some form that will be accessible beyond the first generation of owner/resident.	<b>M</b>	<b>M</b>	
ID		OPTIONAL			
<b>ID</b>	<b>1</b>	<b>INNOVATION IN MATERIALS</b>			
	<b>1.1</b>	<b>Life-Cycle Assessment</b> Perform a Life-Cycle Assessment of the project's structure and enclosure and demonstrate a minimum of 5% improvement from a reasonable baseline building for three environmental categories.	<b>4</b>	<b>0</b>	
<b>ID</b>	<b>2</b>	<b>INTEGRATIVE AND UNIVERSAL DESIGN</b>			
	<b>2.1</b>	<b>Green Building Specialist</b> Engage an expert in green buildings and sustainable construction practices to provide advice on effective green building strategies to the design team.	<b>1</b>	<b>1</b>	
	<b>2.3</b>	<b>Design for Safety and Accessibility</b> Demonstrate that at least 25% of the units in the building have been designed to meet the SAFERhome standards ( <a href="http://www.saferhomesociety.com/">http://www.saferhomesociety.com/</a> ), which address issues of accessibility, children's safety, seniors and aging in place.	<b>1</b>	<b>0</b>	
	<b>2.2</b>	<b>Design for Security and Crime Prevention</b> Demonstrate that the design has been reviewed by an accredited Crime Prevention Through Environmental Design (CPTED) practitioner .	<b>2</b>	<b>0</b>	
<b>ID</b>	<b>3</b>	<b>MARKET TRANSFORMATION</b>			
	<b>3.1</b>	<b>Educate the Sales Staff</b> Develop marketing materials based on the environmental performance of the project and ensure the sales staff is aware of and knowledgeable about the green building features.	<b>1</b>	<b>1</b>	
<b>ID</b>	<b>4</b>	<b>ACADEMIC LINKS</b>			
	<b>4.1</b>	<b>Enhance Research or Further Student Development</b> Collaborate with UBC students and/or faculty on a research project or other opportunities to enhance the academic mission of the University and integrate it with the community. The research project should be concurrent with, and applicable to, the current project.	<b>5</b>	<b>5</b>	
	<b>4.2</b>	<b>Energy Data Sharing</b> Incorporate a data sharing agreement into the sales contracts or strata constitution that allows building aggregate energy data to be collected for use by the UBC Campus Sustainability.	<b>4</b>	<b>0</b>	
<b>ID</b>	<b>5</b>	<b>INNOVATIVE DESIGN</b>			
	<b>5.1</b>	<b>Innovative Design or Exemplary Achievement</b> Demonstrate exceptional performance above the requirements set by one of the existing credits or the implementation of an innovative design strategy not specifically addressed by any of the existing credits.	<b>2</b>	<b>2</b>	Separated Bike Ramp Into Parkade
	<b>5.2</b>	<b>Innovative Design or Exemplary Achievement</b> Demonstrate exceptional performance above the requirements set by one of the existing credits or the implementation of an innovative design strategy not specifically addressed by any of the existing credits.	<b>2</b>	<b>0</b>	
	<b>5.3</b>	<b>Innovative Design or Exemplary Achievement</b> Demonstrate exceptional performance above the requirements set by one of the existing credits or the implementation of an innovative design strategy not specifically addressed by any of the existing credits.	<b>2</b>	<b>0</b>	