

BREEAM ASSESSMENT CRITERIA

Website: <http://www.breem.org/>

Values for each criterion in BREEAM have been re-weighted as a percentage of the overall score, and are here presented below. BREEAM *Design and Procurement* and BREEAM *Operations and Management* for offices have been combined in the table below.

Category/Requirement	Percentage Score
1 Management	16.4
Building Regulations	1.8
Best Practices	1.8
Monitoring Implementation	2.7
Recycled Construction Timber	0.9
Tenant Information	0.9
Company Policy on Environment	2.0
Environmental Purchasing Policy	2.0
EMS	2.0
Operations and Management Manual	2.0
2 Health and Wellbeing	16.4
80% Adequately Day lit	1.2
Desks Location	1.2
Window Antiglare	1.2
Ballasts	1.2
Illuminance Levels	1.2
Independent Lighting Control	1.2
Openable Windows	1.2
Air Intake	1.2
Fresh Air	1.2
Thermal Comfort	0.6
Local Temperature Control	1.2
Legionella	1.2
Noise	0.6
Smoking	0.5
Clean Carpets	0.5
Occupant Feedback	0.5
Occupant Satisfaction Recording	0.5
3 Energy	15.5
CO2 Emissions	9.7
Electricity Component Metering	0.8
Sub-Metering	0.8
Automated External Lighting	0.8
Preventive Maintenance Procedures	1.4
Energy Policy	0.7
Reduction in CO2 Emissions	1.0
Occupant Feedback	0.3
4 Transport	12.6
Public Transport	1.5
Transport Node	7.6

Bicycle Facilities	2.3
User Travel Plans	0.8
Travel Survey	0.3
5 Water	5.5
Above Regulation	2.3
Water Metering	0.8
Leak Detection	0.8
Leak Detection Shut Off	0.8
O&M For All Sanitary Fittings	0.3
Water Monitoring	0.6
6 Materials	10.9
A' rating per <i>Green Guide to Specs.</i>	1.8
Occupants Carpet Selection	0.5
50% of façade is reuse façade	0.5
80% reuse of existing structures	0.5
Recycled Building Materials	0.5
Materials Responsibly Sourced	1.4
Recyclable Materials Storage	2.3
Hazardous Material Information	1.8
Recycling Office Consumables	1.8
7 Land Use	8.2
Use Industrial Site	0.8
Decontaminated Land	0.8
Low Ecological Value Land	0.8
Animal Conservation	1.6
Species Protection	2.5
Above Mandatory Requirements	1.6
8 Pollution	14.7
Refrigerants	1.1
Refrigerant leak detection	2.3
Insulation Pollution	0.5
Nitric Oxides	3.4
Flooding	1.7
Pollution Treatment Area	1.1
Renewable Energy	3.4
Obtrusive Lights	1.1
Total	100.0
Pass:	25
Good:	41
Very Good:	57
Excellent	74

LEED ASSESSMENT CRITERIA

Website: <http://www.usgbc.org>

Values for each criterion in LEED have been re-weighted as a percentage of the overall score, and are here presented below. 'C' represents compulsory conditions that were not used in the weighting.

Category/Requirement	Percentage Score
Sustainable Sites	20.3
Erosion and Sedimentation Control	C
Site Selection	1.4
Urban Redevelopment	1.4
Brownfield Redevelopment	1.4
Alternative Transportation	5.8
Reduced Site Disturbance	2.9
Stormwater Management	2.9
Reduced Heat Island Effect	2.9
Light Pollution Reduction	1.4
Water Efficiency	7.2
Water Efficient Landscaping	2.9
Innovative Wastewater Technologies	1.4
Water Use Reduction	2.9
Energy and Atmosphere	24.6
Fundamental Building Systems Commissioning	C
Minimum Energy Performance	C
CFC Reduction in HVAC&R Equipment	C
Optimize Energy Performance	14.5
Renewable Energy	4.3
Additional Commissioning	1.4
Ozone Protection	1.4
Measurement and Verification	1.4
Green Power	1.4
Materials and Resources	18.8
Storage and Collection of Recyclables	C
Building Reuse	4.3
Construction Waste Management	2.9
Resource Reuse	2.9
Recycled Content	2.9
Local/Regional Materials	2.9
Rapidly Renewable Materials	1.4
Certified Wood	1.4
Indoor Environmental Quality	21.7
Minimum IAQ Performance	C
Environmental Tobacco Smoke (ETS) Control	C
Carbon Dioxide (CO2) Monitoring	1.4
Ventilation Efficiency	1.4
Construction IAQ Management Plan	2.9
Low-Emitting Materials	5.8

Indoor Chemical and Pollutant Source Control	1.4
Controllability of Systems	2.9
Thermal Comfort	2.9
Day-lighting and Views	2.9
Innovation and Accredited Professional	7.2
Innovations in Design	5.8
LEED Existing Building Accredited Professional	1.4
Certified	38
Silver	48
Gold	57
Platinum	75

GREEN STAR ASSESSMENT CRITERIA

Website: <http://www.gbca.org.au/>

Values for each criterion in GREEN STAR have been re-weighted as a percentage of the overall score, and are here presented below. 'C' represents compulsory conditions that were not used in the weighting.

Category/Requirement	Percentage Score
Management	9.2
Green Star Accredited Professional	1.4
Commissioning - Clauses	1.4
Commissioning - Building Tuning	0.7
Commissioning - Commissioning Agent	0.7
Building Users' Guide	0.7
Environmental Management	1.4
Waste Management	1.4
Learning Resource	0.7
Maintainability	0.7
Indoor Environment Quality	18.3
Ventilation Rates	2.1
Air Change Effectiveness	1.4
Carbon Dioxide and VOC Monitoring and Control	0.7
Daylight	2.8
Daylight Glare Control	0.7
High Frequency Ballasts	0.7
Electric Lighting Levels	0.7
External Views	0.7
Thermal Comfort	2.1
Hazardous materials	0.7
Internal Noise Levels	1.4
Volatile Organic Compounds	2.8
Formaldehyde Minimisation	0.7
Mould Prevention	0.7
Energy	17.6
Ene-Conditional Requirement	C
Energy Improvement	10.6
Electrical Sub-metering	0.7
Peak Energy Demand Reduction	1.4
Stairs	0.7
Unoccupied Areas	0.7
Lighting Zoning and Control	0.7
Efficient External Lighting	0.7
Car Park Ventilation	1.4
Centralised Energy Systems	0.7
Transport	9.2
Car Park Minimisation	1.4
Fuel Efficient Transport	0.7
Cyclist Facilities	2.8
Commuting Mass Transport	3.5

Pedestrian Routes	0.7
Water	11.3
Occupant Amenity Potable Water Efficiency	3.5
Water Meters	0.7
Landscape Irrigation Water Efficiency	2.1
Heat Rejection Water Consumption	2.8
Fire System Water Consumption	0.7
Portable Water Use in Laboratories	1.4
Materials	17.6
Recycling Waste Storage	0.7
Reuse of Façade	1.4
Reuse of Structure	2.1
Recycled Content of Concrete	2.1
Recycled Content of Steel	1.4
PVC Minimisation	1.4
Sustainable Timber	1.4
Flooring	2.1
Joinery	1.4
Loose Furniture	2.1
Recycled-Content & Reuse Products and Materials	0.7
Disassembly/Deconstruction	0.7
Land Use & Ecology	5.6
Ecological Value of Site	
Reuse of Land	0.7
Reclaimed Contaminated Land	1.4
Change of Ecological Value	2.8
Topsoil and Fill Removal from Site	0.7
Emissions	7.7
Ozone Depletion Potential	0.7
Refrigerant GWP	1.4
Refrigerant Leak Detection and Recovery	0.7
Watercourse Pollution	2.1
Reduced Flow to Sewer	1.4
Light Pollution	0.7
Legionella	0.7
Innovation	3.5
One Star	10
Two Star	20
Three Star	30
Four Star	45
Five Star	60
Six Star	75

CASBEE ASSESSMENT CRITERIA

Website: <http://www.ibec.or.jp/CASBEE/english/overviewE.htm>

Values for each criterion in CASBEE have been re-weighted as a percentage of the overall score, and are here presented below. The right-hand column indicates which category of BREEAM each requirement was allocated to. ‘--’ indicates criterion which could not be allocated to a BREEAM category.

Q Building Environmental Quality & Performance	Percentage Score	BREEAM Category Allocation
Q-1 Indoor Environment	20.0	
Background noise	0.6	2
Equipment noise	0.6	2
Sound Insulation of Openings	0.7	2
Sound Insulation of Partition Walls	0.5	2
Sound Absorption	0.6	2
Room Temperature Setting	1.1	2
Variable Loads & Following-up Control	0.0	2
Perimeter Performance	0.7	2
Zoned Control	1.1	2
Temperature & Humidity Control	0.4	2
Individual Control	0.0	2
Allowance for After-hours Air Conditioning	0.4	2
Monitoring Systems	0.0	2
Humidity Control	1.4	2
Type of Air Conditioning	2.1	2
Daylight Factor	0.9	2
Openings by Orientation	0.0	2
Daylight Devices	0.6	2
Glare from light fixtures	0.6	2
Daylight control	0.9	2
Illuminance Level	0.5	2
Uniformity Ratio of Illuminance	0.2	2
Lighting Controllability	1.3	2
Chemical Pollutants	0.6	8
Mineral Fiber	0.6	2
Mites, Mold etc.	0.6	2
Legionella	0.6	2
Ventilation Rate	0.4	2
Natural Ventilation Performance	0.4	2
Consideration for Outside Air Intake	0.4	2
Air Supply Planning	0.4	2
CO ₂ Monitoring	0.5	2
Control of Smoking	0.5	2
Q-2 Quality of Service	15.0	
Provision of Space & Storage	1.2	--
Adaptation of Building Structure & Services to IT Innovation	1.2	--
Barrier-free Planning	1.2	2

Perceived Spaciousness & Access to View	0.8	--
Space for refreshment	0.8	--
Décor Planning	0.8	6
Earthquake-resistance	1.8	8
Seismic Isolation & Vibration Damping Systems	0.4	8
Necessary Refurbishment Interval for Exterior Finishes	0.5	--
Necessary Renewal Interval for Main Interior Finishes	0.2	--
Necessary Renewal Interval for Plumbing & Wiring Materials	0.5	--
Necessary Renewal Interval for Major Equipment & Services	0.5	--
HVAC System	0.2	--
Water Supply & Drainage	0.2	--
Electrical Equipment	0.2	--
Support method of machines & ducts	0.2	--
Communications & IT equipment	0.2	--
Allowance for Story Height	0.8	--
Adaptability of Floor Layout	0.5	--
Floor Load Margin	1.3	--
Ease of Air Conditioning Duct Renewal	0.3	--
Ease of water supply & drain pipe renewal	0.3	--
Ease of Electrical Wiring Renewal	0.2	--
Ease of Communications Cable Renewal	0.2	--
Ease of Equipment Renewal	0.4	--
Provision of backup space	0.4	--
Q-3 Outdoor Environment on Site	15.0	
Preservation & Creation of Biotope	4.5	7
Townscape & Landscape	6.0	7
Attention to Local Character & Improvement of Comfort	2.3	7
Improvement of the Thermal Environment on Site	2.3	7
LR Reduction of Building Environmental Loadings		
LR-1 Energy	20.0	
Building Thermal Load	6.0	3
Natural Energy Utilization	4.0	3
HVAC System	2.7	3
Ventilation System	0.9	3
Lighting System	1.8	3
Hot Water Supply System	0.3	3
Elevators	0.3	3
Monitoring	2.0	1
Operational Management System	2.0	1
LR-2 Resources & Materials	15.0	
Water Saving	0.9	5

Rainwater Use Systems	0.9	5
Gray Water Reuse System	0.5	5
Reuse Efficiency of Materials Used in Structure	3.0	6
Reuse Efficiency of Non-structural Materials	1.5	6
Timber from Sustainable Forestry	0.5	1
Materials with Low Health Risks	1.1	6
Reuse of Existing Building Structure etc.	2.3	6
Predicted Volume of Recyclable Materials	2.3	6
Fire Retardant	0.8	8
Insulation Materials	0.8	8
Refrigerants	0.8	8
LR-3 Off-site Environment	15.0	
Air Pollution	2.3	8
Noise & Vibration	1.1	8
Odours	1.1	8
Wind Damage & Sunlight Obstruction	2.3	7
Light Pollution	1.5	8
Heat Island Effect	4.5	8
Load on Local Infrastructure	2.3	8

GREEN MARK ASSESSMENT CRITERIA

Website: http://www.bca.gov.sg/GreenMark/green_mark_buildings.html

Values for each criterion in GREEN MARK have been re-weighted as a percentage of the overall score, and are presented below.

Category/Requirement	Percentage Score
Part 1: Energy Efficiency	
Building Envelope Design	10
Energy Efficiency Index	5
Electrical Sub-metering	2
Energy Efficient Features	12
Efficient Lighting Control	2
Green Plot Ratio	4
Total	35
Part 2: Water Efficiency	
Water Efficient Fittings	6
Water Usage and Leak Detection	3
Water Efficient Irrigation and Landscaping	4
Water Consumption of Cooling Tower	2
Total	15
Part 3: Site & Project Management	
Conservation & Restoration	3
CONQUAS	2
Public Transport Accessibility	1
Environmental Management System	5
Environment Friendly Materials	5
Buildable Design	1
Building Maintenance and Operation	3
Total	20
Part 4: Indoor Environmental Quality and Environmental Protection	
CO and CO2 Monitoring	2
High Frequency Ballasts	2
Luminance Level	2
Thermal Comfort	2
Noise Level	2
Indoor Air Pollutants	2
Refrigerants	3
Total	15
Part 5: Innovation	
Innovation	
Total	15
Certified	50
Gold	70

Gold Plus	80
Platinum	85

EACB ASSESSMENT CRITERIA

Website:

Level 1	Level 2	Level 3
Energy Consumption		
Material Consumption		
Waste	Volume Waste	
	Slag and Ashes	
	Hazardous Waste	
Contributions to global climate change	Global Warming	
	Ozone Depletion	
Contribution to Air Pollution	Acidification	
	Photochemical Ozone Formation	
Indoor Climate	Air Quality	Offgasing
		Dust
		Ventilation
		Moisture Resistance
	Thermal Climate	Low Temperature
		High Temperature
		Draught
		Heat Radiation to Cold Surfaces
		Individual Climate Control
	Daylight, View, Artificial light	Daylight Conditions
		View
		Solar Shading
		Artificial Lighting
	Noise and Acoustics	Transmitted Noise from Outside
		Transmitted Noise from Other Rooms
		Noise from Installations
		Reverberations time
Other Indicators	Hazardous Substances	
	Water Consumption	
	Operation of the Building	
	Localization of the Building (Transport)	
	Own Choice	

GOBAS Assessment Criteria

- Q1** **Quality of Site**
 - Fire Prevention
 - Air Quality

 - Q2** **Quality of Facilities and Service**
 - Public Facilities
 - Transport Facilities
 - Suitability of Building

 - Q3** **Outdoor Physical Environment**
 - Sound
 - Light
 - Heat
 - Wind
 - Water
 - To Make Greener (plants)

 - L1** **Necessity to Carry out project**
 - Importance of Project Control
 - Scale of Control
 - Availability of Temporary Facilities

 - L2** **Effects on the environment**
 - Effect of Land Usage
 - Reduce Damage to the Ecosystem
 - Effect on Physical Environment
 - Effects on Municipal Facilities

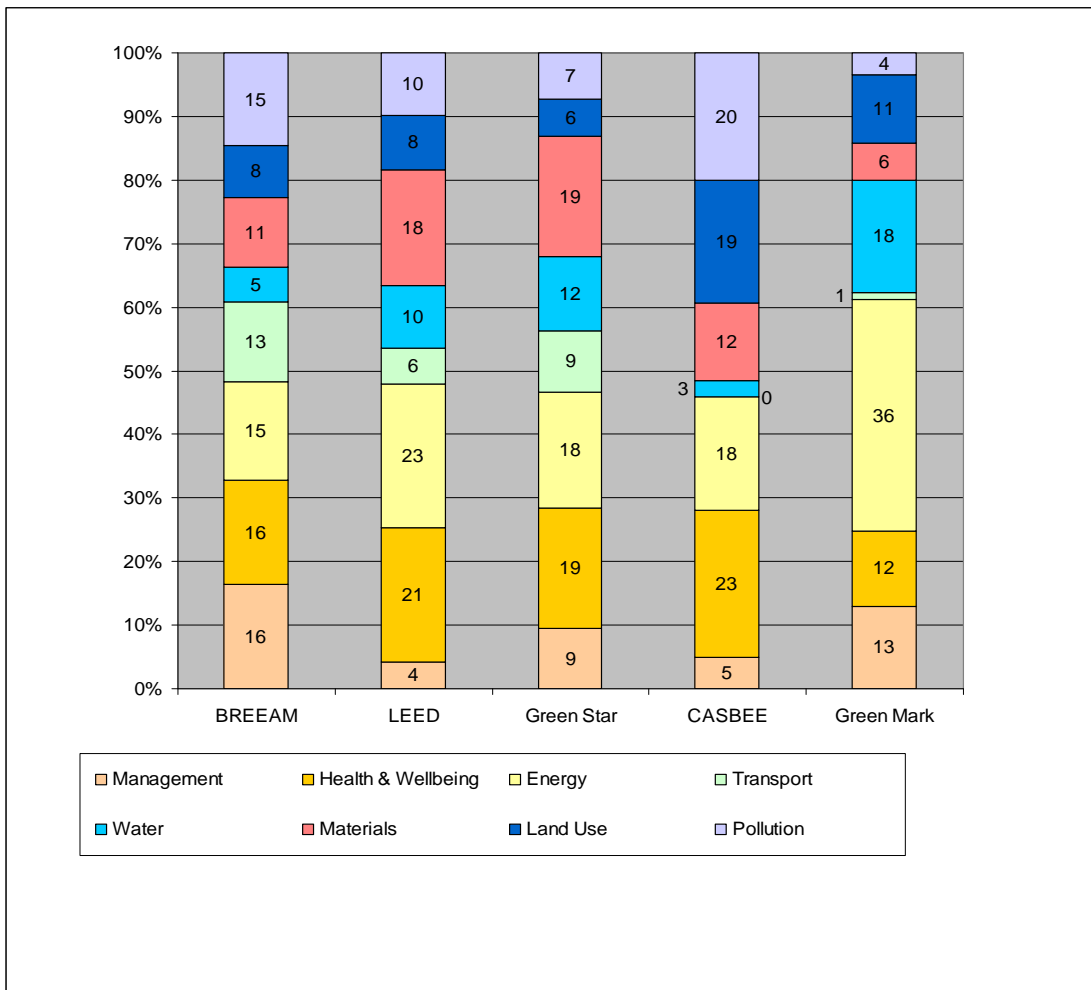
 - L3** **Energy Consumption**
 - Quantity of Energy Used
 - Effect on Air Quality

 - L4** **Materials**
 - Recycle Existing Building Materials
 - Building Materials
 - Solid Waste Handling

 - L5** **Water Consumption**
 - Quantity of Water Used
 - Recycled Water Use
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CRITERIA CAPARISON BETWEEN SELECTED EBRS

	BREEAM	LEED	Green Star	CASBEE	Green Mark
Management	16	4	9	5	13
Health and Wellbeing	16	21	19	23	12
Energy	15	23	18	18	36
Transport	13	6	9	0	1
Water	5	10	12	3	18
Materials	11	18	19	12	6
Land Use	8	8	6	19	11
Pollution	15	10	7	20	4
Rating 1	25	38	10	--	50
Rating 2	41	48	20	--	70
Rating 3	57	57	30	--	80
Rating 4	74	75	45	--	85
Rating 5			60	--	
Rating 6			75	--	



COMPARISON OF BREEAM AND GREEN STAR

Side-by-side comparison of BREEAM and GREEN STAR from Annex 1 and 3. Highlighted cells in GREEN STAR correspond with requirements in BREEAM.

BREEAM	%	GREEN STAR	%
1 Management	16.4	Management	9.2
Building Regulations	1.8	Green Star Accredited Professional	1.4
Best Practices	1.8	Commissioning - Clauses	1.4
Monitoring Implementation	2.7	Commissioning - Building Tuning	0.7
Recycled Construction Timber	0.9	Commissioning - Commissioning Agent	0.7
Tenant Information	0.9	Building Users' Guide	0.7
Company Policy on Environment	2.0	Environmental Management	1.4
Environmental Purchasing Policy	2.0	Waste Management	1.4
EMS	2.0	Learning Resource	0.7
Operations and Management Manual	2.0	Maintainability	0.7
2 Health and Wellbeing	16.4	Indoor Environment Quality	18.3
80% Adequately Day-lit	1.2	Ventilation Rates	2.1
Desks Location	1.2	Air Change Effectiveness	1.4
Window Antiglare	1.2	Carbon Dioxide and VOC Monitoring and Control	0.7
Ballasts	1.2	Daylight	2.8
Illuminance Levels	1.2	Daylight Glare Control	0.7
Independent Lighting Control	1.2	High Frequency Ballasts	0.7
Openable Windows	1.2	Electric Lighting Levels	0.7
Air Intake	1.2	External Views	0.7
Fresh Air	1.2	Thermal Comfort	2.1
Thermal Comfort	0.6	Hazardous materials	0.7
Local Temperature Control	1.2	Internal Noise Levels	1.4
Legionella	1.2	Volatile Organic Compounds	2.8
Noise	0.6	Formaldehyde Minimisation	0.7
Smoking	0.5	Mould Prevention	0.7
Clean Carpets	0.5		
Occupant Feedback	0.5		
Occupant Satisfaction Recording	0.5		
3 Energy	15.5	Energy	17.6
CO2 Emissions	9.7	Ene-Conditional Requirement	
Electricity Component Metering	0.8	Energy Improvement	10.6
Sub-Metering	0.8	Electrical Sub-metering	0.7
Automated External Lighting	0.8	Peak Energy Demand Reduction	1.4
Preventive Maintenance Procedures	1.4	Stairs	0.7
Energy Policy	0.7	Unoccupied Areas	0.7
Reduction in CO2 Emissions	1.0	Lighting Zoning and Control	0.7
Occupant Feedback	0.3	Efficient External Lighting	0.7
		Car Park Ventilation	1.4
		Centralised Energy Systems	0.7
4 Transport	12.6	Transport	9.2
Public Transport	1.5	Car Park Minimisation	1.4
Transport Node	7.6	Fuel Efficient Transport	0.7
Bicycle Facilities	2.3	Cyclist Facilities	2.8

User Travel Plans	0.8	Commuting Mass Transport	3.5
Travel Survey	0.3	Pedestrian Routes	0.7
5 Water	5.5	Water	11.3
Above Regulation	2.3	Occupant Amenity Potable Water Efficiency	3.5
Water Metering	0.8	Water Meters	0.7
Leak Detection	0.8	Landscape Irrigation Water Efficiency	2.1
Leak Detection Shut Off	0.8	Heat Rejection Water Consumption	2.8
O&M For All Sanitary Fittings	0.3	Fire System Water Consumption	0.7
Water Monitoring	0.6	Portable Water Use in Laboratories	1.4
6 Materials	10.9	Materials	17.6
A' rating per <i>Green Guide to Specs.</i>	1.8	Recycling Waste Storage	0.7
Occupants Carpet Selection	0.5	Reuse of Façade	1.4
50% of façade is reuse façade	0.5	Reuse of Structure	2.1
80% reuse of existing structures	0.5	Recycled Content of Concrete	2.1
Recycled Building Materials	0.5	Recycled Content of Steel	1.4
Materials Responsibly Sourced	1.4	PVC Minimisation	1.4
Recyclable Materials Storage	2.3	Sustainable Timber	1.4
Hazardous Material Information	1.8	Flooring	2.1
Recycling Office Consumables	1.8	Joinery	1.4
		Loose Furniture	2.1
		Recycled-Content & Reuse Products and Materials	0.7
		Disassembly/Deconstruction	0.7
7 Land Use	8.2	Land Use & Ecology	5.6
Use Industrial Site	0.8	Ecological Value of Site	
Decontaminated Land	0.8	Reuse of Land	0.7
Low Ecological Value Land	0.8	Reclaimed Contaminated Land	1.4
Animal Conservation	1.6	Change of Ecological Value	2.8
Species Protection	2.5	Topsoil and Fill Removal from Site	0.7
Above Mandatory Requirements	1.6		
8 Pollution	14.7	Emissions	7.7
Refrigerants	1.1	Ozone Depletion Potential	0.7
Refrigerant leak detection	2.3	Refrigerant GWP	1.4
Insulation Pollution	0.5	Refrigerant Leak Detection and Recovery	0.7
Nitric Oxides	3.4	Watercourse Pollution	2.1
Flooding	1.7	Reduced Flow to Sewer	1.4
Pollution Treatment Area	1.1	Light Pollution	0.7
Renewable Energy	3.4	Legionella	0.7
Obtrusive Lights	1.1		
		Innovation	3.5
Pass:	25	One Star	10
Good:	41	Two Star	20
Very Good:	57	Three Star	30
Excellent	74	Four Star	45
		Five Star	60
		Six Star	75

