BREEAM International New Construction 2016
Data Centre Annex - Pilot v0.0

Criteria Annex - SD233 - Annex 2

Building Development Details

This section outlines the information which should be inputted into the initial building details of the online tool, and their effect on the assessment.

Question	Response	Effect on assessment
Project details		
Building type (main description)	Data Centre (pilot)	Relative weighting of Energy category vs other categories significantly increased.
Building type (sub-group)	DC with large supporting functions	All Hea and Tra credits assessed.
	DC with small supporting functions	All Hea and Tra credits assessed. Hea and Tra weightings reduced. Wat weighting reduced (if using closed loop cooling).
	DC with no supporting functions	Hea and Tra weighting significantly reduced. Hea and Tra credits scoped out. Wat weighting reduced (if using closed loop cooling).
Technical manual issue number	SD233 Issue 2.0	
Are there any risks associated with natural hazards (other than flooding) for the assessed development?	Yes	Hea 07 Hazards applicable.
	No	Hea 07 Hazards not applicable. (Default response for UK schemes).
Project scope	Fully fitted data hall with shell and core supporting functions	Only shell and core credits available in Hea category.
	Fully fitted	All credits available in Hea category.
Building services		
All questions except for external lighting.	Answer for supporting functions only	
Is external lighting specified within the construction zone?	Answer for whole facility	

Transportation systems		
Building user transportation systems (lifts and/or escalators)	Answer for whole facility	Determines applicability of Ene 06.
Laboratories		
All questions	Answer for whole facility	Determines applicability of Hea 03 and Ene 07.
Water demands		
Are the data halls cooled using an open loop (evaporative) cooling system?	Yes	Water category assessed against open loop cooling criteria. Water weighting increased.
	No	Water category mostly assessed against base manual criteria. Water weighting determined by size of supporting function.
Additional water uses present? (e.g. vehicle wash, irrigation)	Yes	Base manual criteria for Wat 04 applies.
	No	Wat 04 Water efficient equipment is scoped out.
Pollution		
Will the data centre use power generation via private wire for the provision of primary or secondary supply for more than 50 hours per year?	Yes	Pol 06 Local air quality applicable.
	No	Pol 06 Local air quality is scoped out.
Will the data centre discharge wastewater into a local water body?	Yes	LE 06 Freshwater ecology applicable.
	No	LE 06 Freshwater ecology is scoped out.

Minimum Standards

Minimum standards supercede those in the technical manual.

	Pass	Good	Very Good	Excellent	Outstanding
Man 03 Responsible construction practices	Criterion 2 only (Health and Safety)			One credit (Considerate construction)	
Man 04 Commissioning and handover				Criterion 10 (Building user guide)	
Man 05 Aftercare				One credit (Seasonal commissioning)	
Hea 01 Visual comfort	Criterion 1 only (High frequency ballast)				
Hea 02 Indoor air quality		Criterion 1 only (No asbestos)			
Hea 09 Water quality	Criterion 1 only (minimise legionellosis risk)				
Ene 01 Reduction of energy use and carbon emissions	Supporting functions			Performance equivalent to: EPRINC of 0.36 or 6 credits with Checklist A5	Performance equivalent to: EPRINC of 0.6 or 10 credits with Checklist A5
	Data halls			8 credits	12 credits
				'Resilience level and provisioning' 'Airflow management and design' credits	
Ene 02a Energy monitoring			First sub-metering credit		
Wat 01 Water consumption (supporting functions only, rain / grey water harvesting excluded)	Closed loop	One credit			Two credits
	Open loop	Performance equivalent to one credit			Performance equiv. to two credits
Wat 02 Water monitoring		Criterion 1 only (mains water meter)			
Mat 03 Responsible sourcing of construction products	Criterion 1 only (legal timber)				
Wst 01 Construction waste management					One credit
Wst 03a Operational waste				One credit	

Legend

Abbreviations, headings, and shortcuts used in this annex. Hover over the notes for explanation of abbreviations.

Hea or Tra issues

Credit or Reference	Credits								Criteria + Amendments
	Shell Core			Fully Fitted			SC	FF	
	No	Sm	Lg	No	Sm	Lg	Exp		
Hea 01 Visual comfort									
Pre-requisite	Y	Y	Y	Y	Y	Y	-	-	
Glare control	-	-	-	-	1	1	-	-	**Over-riding security considerations:** The requirements for glare control, daylighting, view out and internal / external lighting from the technical manual may be omitted in secure occupied areas.
Daylighting	-	1	1	-	1	1	-	-	
Sum	-	1	1	-	2	2	0	0	

Water issues

Credit or Reference	Credits				Criteria + Amendments
	Standard		Exp		
	CL	OL	CL	OL	
Wat 01 water consumption					
-	5	min std only	1	-	**Issue applies to supporting functions only:** Assess supporting functions against the technical manual against the alternative method.

Other issues

Credit or Reference	Credits		Criteria + Amendments
	Std	Exp	
Man 06 Reporting and disclosure			
Energy disclosure	1	-	**New issue:** Refer to Annex 1 - Revised Issues for requirements.
Water disclosure	1	-	
Third party disclosure	-	1	
Hea 08 Private space			
-	-	-	Issue N/A

Management

Revised criteria applicable to all fit-out levels, supporting function sizes and cooling systems.

Credit or Reference	Credits		Criteria + Amendments
	Std	Exp	
Man 01 Project brief and design			
Stakeholder consultation (project delivery)	**1**	**-**	**Criterion 2 additional requirement:** *CLC/TR 50600 99-1:2019 5.1.1 Group involvement* Establish an approval board containing representatives from all disciplines (software, IT, M&E, procurement). Require the approval of this group for any significant decision to ensure that the impacts of the decision have been properly understood and an effective solution reached. For example, this could include the definition of standard IT hardware lists through considering the M&E implications of different types of hardware. This group could be seen as the functional equivalent of a change board. During construction the function of the board may be fulfilled by the project team, however evidence must be provided at PCR that the responsibilities of the board have been handed over post-construction. **Additional DS evidence:** None **Additional PCR evidence:** Hand-over documentation from project team to operator. Appointment documentation for new approval board, post hand-over.
Stakeholder consultation (third party)	**1**	**-**	*CLC/TR 50600 99-1:2019 5.1.1 Group involvement* Where relevant, the involvement of third parties shall also be considered in the establishment of the approval board.
Sustainability champion (design)	**1**	**-**	
Sustainability champion (monitoring progress)	**1**	**-**	
Man 02 Lifecycle cost and service life planning			
Elemental life cycle cost	**2**	**-**	This issue applies to the building and building systems only. **Data centres with operator procured IT equipment:** Projected IT equipment refresh rates are not within the scope of this assessment, however the design team may still wish to include this information as part of the evidence submitted if this forms part of the operator's overall LCC strategy.
Component level LCC	**1**	**-**	
Capital cost reporting	**1**	**-**	IT equipment cost should not be included within the capital cost reporting.
Man 03 Responsible construction practices			
Environmental management	**1**	**-**	
Sustainability champion (construction)	**1**	**-**	

Considerate construction	**2**	**-**	
Monitoring of site impacts	**2**	**-**	
Exemplary level criteria	**-**	**1**	

Man 04 Commissioning and handover			
Commissioning and testing schedule and responsibilities	**1**	**-**	
Commissioning building services	**1**	**-**	Criteria 6d relating to 'simple building services' is not applicable to this assessment. The credit must be assessed against 6a - 6c.
Testing and inspecting building fabric	**1**	**-**	**Data halls:** Criterion 9: the requirements relating to continuity of insulation, thermographic survey and thermal bridging do not apply. This credit shall be awarded on the basis of testing the integrity of the building fabric for air-tightness only to ensure optimal air-flow in data halls and all relevant plant areas. The credit shall be assessed normally for any supporting functions of the building.
Handover	**1**	**-**	

Man 05 Aftercare			
Aftercare support	**1**	**-**	
Seasonal commissioning	**1**	**-**	**Supporting functions:** Follow the technical manual criteria. **Data halls - seasonal commissioning possible:** Where the availability class allows seasonal commissioning to take place, follow the technical manual criteria. **Data halls - seasonal commissioning not possible:** Where the availability class does not permit seasonal commissioning, achieve the following over a minimum 12 month period: - CLC/TR 50600 99-1:2019 5.18.14 Review of cooling capacity before ICT equipment changes. - CLC/TR 50600 99-1:2019 5.18.15 Review of cooling strategy. - Criterion 3ai, 3aii do not apply. - Criterion 3aiii apply - Criterion 3aiv applies only regarding incorporating revisions in operating procedures into the operations and maintenance (O&M) manuals. **Additional DS evidence:** Re-optimisation strategy, if seasonal commissioning not possible. **Additional PCR evidence:** As above.
Post-occupancy evaluation	**1**	**-**	**Independent third party:** Where there are over-riding security concerns, the POE may be carried out without the use of an *independent third party* . See definitions in the manual for further clarification. **Criterion 4c:** The requirements of this criterion have been expanded into Man 06 Reporting and Disclosure. For this credit please ignore this requirement.
Exemplary level criteria	**-**	**-**	The requirements of this criterion have been expanded into Man 06 Reporting and Disclosure. This credit has been scoped out.

Man 06 Reporting and disclosure			
Energy disclosure	**1**	**-**	**New issue:** Refer to Annex 1 - Revised issues document for requirements.
Water disclosure	**1**	**-**	
Third party disclosure	**-**	**1**	

Sum	**23**	**2**

Health and wellbeing

Hea 07 Hazards and **Hea 09 Water Quality: minimising risk of contamination** credit is assessed for the whole facility. All other issues in this category are assessed on supporting functions only. Data halls are not assessed.

No supporting functions:
Only parts of Hea 01, 02, 06, 07 and 09 will be assessed, weighting of Hea category is significantly reduced.
Small supporting functions:
Weighting of Hea category is reduced. Thermal zoning and controls criteria is not applicable.
Large supporting functions:
Whole category applicable with standard weighting.

Credit or Reference	Credits								Criteria + Amendments
	Shell Core			Fully Fitted			SC	FF	
	No	Sm	Lg	No	Sm	Lg	Exp		
Hea 01 Visual comfort									
Pre-requisite	Y	Y	Y	Y	Y	Y	-	-	
Glare control	-	-	-	-	1	1	-	-	**Over-riding security considerations:** The requirements for glare control, daylighting, view out and internal / external lighting may be omitted in secure occupied areas. However the requirements are assessed and still apply in all remaining occupied areas. Where there are no applicable areas for assessment, the relevant credit may be scoped out.
Daylighting	-	1	1	-	1	1	-	-	
View out	-	1	1	-	1	1	-	-	
Internal and external lighting levels	-	-	-	-	1	1	-	-	
Hea 02 Indoor air quality									
Pre-requisite	Y	Y	Y	Y	Y	Y	-	-	
Indoor air quality plan	-	-	-	-	1	1	-	-	
Ventilation	-	1	1	-	1	1	-	-	
Emissions from building products	-	-	-	-	1	1	-	-	
Post-construction indoor measurement	-	-	-	-	1	1	-	-	
Potential for natural ventilation	-	1	1	-	1	1	-	-	
Exemplary level criteria	-	-	-	-	-	-	0	2	
Hea 03 Safe containment in laboratories									
Lab containment devices and containment areas	-	1	1	-	1	1	-	-	

Buildings with containment level 2 and 3 lab facilities	-	1	1	-	1	1	-	-	

Hea 04 Thermal comfort									
Thermal modelling	-	1	1	-	1	1	-	-	
Adaptability for a projected climate change scenario	-	1	1	-	1	1	-	-	
Thermal zoning and controls	-	-	-	-	0	1	-	-	

Hea 05 Acoustic Performance									
Indoor ambient noise and sound insulation	-	1	1	-	1	1	-	-	
Reverberation times	-	-	-	-	1	1	-	-	

Hea 06 Accessibility									
Safe access	1	1	1	1	1	1	-	-	**No supporting functions:** Only criteria 8 - 11 apply.
Inclusive and accessible design	-	1	1	-	1	1	-	-	The requirements apply only to supporting functions and any access required from the personnel entrance to these areas.

Hea 08 Private space									
-	-	-	-	-	-	-	-	-	Issue N/A

Hea 09 Water quality									
Minimising risk of contamination + Provision of fresh drinking water	1	1	1	1	1	1	-	-	Minimising risk of contamination criteria applies to the entire building. **No supporting functions:** Provision of fresh drinking water criteria N/A. **Shell and Core:** Provision of fresh drinking water criteria N/A.

Sum (excluding Hea 07 Hazards)	2	12	12	2	18	19	0	2

Hea 07 Hazards (separate weighting)

-	**1**	**1**	**1**	**1**	**1**	**1**	**-**	**-**	Additional information on risk analysis relevant to data centres can be found in *CLC/TR 50600-1:2019 Information technology - Data centre facilities and infrastructures - Part 1: General concepts.*

Energy

The focus of this category is on achieving the requirements set out in CLC/TR 50600 99-1:2019. The majority of the requirements are listed in Checklist A8. The requirements of Ene 04 partially overlap this standard, therefore some credits in this issue have been recognised instead within Checklist A8 and Ene 01.

Credit or Reference	Credits		Criteria + Amendments
	Std	Exp	
Ene 01 Reduction of energy use and carbon emissions			
All credits	18	4	**Revised issue:** See Annex 1 - Revised Issues document and Checklist A8 in this annex for requirements. **LZC technologies for supporting functions:** Where on-site LZC technologies are shared between supporting functions and data halls, evidence must be provided that the contribution of LZC energy to supporting function operation is not double counted. Only renewable energy provided via direct wire is recognised in contributing towards performance of supporting functions.
Ene 2a Energy monitoring			
Sub-metering of major energy consuming systems	**1**		**Relevant energy consuming systems:** Supporting functions only: 1. Space heating 2. Domestic hot water heating Whole data centre, including supporting functions: 3. Humidification 4. Cooling 5. Ventilation, i.e. fans (this excludes fans in chillers / CRACs etc) 6. Pumps 7. Lighting 8. Renewable or low carbon systems 9. Controls (this includes security systems, BMS etc. The design team can determine the appropriate scope of metering for this category) 10. UPS systems (whole data centre; input and output) 11. Generators (whole data centre) 12. Power distribution units (PDUs) 13. Other major energy-consuming systems or plant
Sub-metering of high energy load and tenancy areas	**2**	**-**	**Relevant function areas or departments:** CN4.6 gives some guidance applicable to data centres, however sub-metering strategy should also be informed by factors such as: - Long term capacity management and data centre strategy (see *CLC/TR 50600-3-1:2015 Data centre facilities and infrastructures - Part 3-1: Management and operational information*). - Requirements of different occupiers and IT equipment configurations. - Separate environmental zones. - Scalability and expansion of the data centre building and services design
Ene 03 External lighting			
-	**1**	**-**	

Ene 04 Low carbon design			
Passive design analysis	-	-	These credits are recognised within Ene 01 and Checklist A8 under 'Free and economised cooling'.
Free cooling	-	-	
Low and zero carbon technologies	**1**	**-**	This credit excludes re-use of waste heat, which is recognised within Ene 01 and Checklist A8 under 'Re-use of data centre waste heat'. All other renewable technologies recognised in this issue still apply.

Ene 05 Energy efficient cold storage			
All credits	**0**	-	Issue N/A

Ene 06 Energy efficient transport systems			
Energy consumption	**1**	**-**	To gain one credit, achieve criteria 1-6. For structural reasons, most new-build data centres are likely to be built outwards, rather than upwards and are unlikely to feature a large number of lifts or escalators. The value of this issue has been reduced to reflect this, and the requirements of Energy Consumption and Energy Efficient Features credits have been combined.
Energy efficient features	-	-	

Ene 07 Energy efficient laboratory			
Design specification	**1**	**-**	
Best practice energy efficient measures	**4**	**-**	

Ene 08 Energy efficient equipment			
-	-	-	IT equipment within a data centre is likely make up the overall majority of energy consumption in the data centre. As the specification and operation of IT equipment falls outside of the scope of this BREEAM assessment, and all other uses are insignifcant in terms of energy consumption, this issue has been scoped out. it is recommended that operators become a participant within the EU Code of Conduct and follow the guidance relating to the management of IT equipment.

Ene 09 Drying space			
All credits	-	-	Issue N/A

Sum	**29**	**4**

Checklist A8

This checklist references *CLC/TR 50600-99-1:2019 Information technology. Data centre facilities and infrastructures. Recommended practices for energy management.* To achieve the relevant credits in Ene 01, all of the measures in the section must be achieved. For the full wording of the requirements please refer to the standard.

Legend	
Black	Mandatory requirement to achieve the credit(s).
Grey	Requirement must be met only where relevant to the project. Where these are not applicable, answer N/A and provide evidence for exclusion.
5.4.16	Index reference to practice in CLC/TR 50600 99-1:2019.
1	Additional BREEAM criteria.

Index	Practice	Notes	Achieved			Credits	
			Y	N	NA	Std	Exp
Building physical layout							
5.4.36	Locate mechanical and electrical equipment outside the cooled area					1	-
5.4.37	Select or create a building with sufficient slab to slab separation / ceiling height						
5.4.38	Facilitate the use of free cooling						
5.4.39	Location and orientation of mechanical and electrical equipment						
Resilience level and provisioning							
5.4.2	Build resilience according to business requirements	Requirement for Excellent minimum standard.				3	-
5.4.3	Consider multiple levels of resilience						
5.4.4	Limit provisioning of power and cooling to a maximum of 18 months of computer room growth capacity						
5.4.5	Design infrastructure to maximise part load efficiency						

Selection and deployment of new power equipment							
5.4.27	Modular UPS equipment					2	-
5.4.28	High efficiency UPS						
5.4.31	Elimination of isolation transformers						
5.4.32	Efficient part load operation						

Airflow management and design							
5.4.6	Implement hot / cold aisle alignment	Requirement for Excellent minimum standard. If 6.4.10 'Direct liquid cooling of ICT devices' has been achieved, these credits are awarded by default.				3	-
5.4.7	Contained hot or cold air						
5.4.10	Separate environmental zones						
5.4.11	Separate environmental zones - co-location or MSP						
5.4.12	Control of supplied airflow volume minimising over-pressure						

High efficiency cooling system							
5.4.15	Select chillers with high Coefficient of Performance					2	-
5.4.16	Efficient part load operation						
5.4.18	Select systems which facilitate the use of free cooling						
5.4.19	Do not share data centre chilled water system with comfort cooling						
5.4.20	Do not allow non-ICT equipment to dictate cooling system set points						
5.4.21	Chilled water pump control strategy						
5.4.22	Free cooling installation						
6.4.10	Direct liquid cooling of ICT devices	Achieving these credits modifies the requirements of Airflow management and design, and CRAC / CRAH equipment.				-	2

CRAC / CRAH equipment							
5.4.23	Variable speed fans	If 6.4.10 'Direct liquid cooling of ICT devices' has been achieved, provide evidence that the intended outcomes of 5.4.23, 5.4.24, 5.4.26 have been achieved where the heat transfer medium is liquid e.g. the requirements may require additional consideration of: - 5.4.23 pumps, - 5.4.24 liquid temperature set points - 5.4.26 right sizing of cooling units				**2**	**-**
5.4.24	Control on CRAC / CRAH unit supply air temperature						
5.4.25	Do not control humidity at CRAC / CRAH unit						
5.4.26	Cooling unit sizing and selection						

Free and economised cooling							
6.4.2	Installation of free cooling AND / OR	Free cooling systems use ambient air as a heat transfer medium. Alternative cooling sources may be other methods which may, for instance, use ground source cooling from local water sources. For consideration for this credit, any alternative cooling source relying on a local water source must comply with: - Wat 05 Shared water challenge **'Stakeholder identification and engagement'** and **'Water risk report'** credits - LE06 Freshwater ecology **'Good water quality'** credit				**4**	**-**
6.4.9	Alternative cooling sources						
1	A feasibility study has been carried out by Technical Design stage by a relevant specialist to establish the most appropriate free and / or alternative cooling strategies (see notes) that will maximise free cooling hours and free cooling efficiency based on IT equipment requirements.						
2	The chosen system is installed in the facility, and free cooling hours are reported in compliance with Man 06 Reporting and Disclosure 'Energy disclosure' credit.						

Re-use of data centre waste heat							
6.4.14	Heat pump assisted waste heat re-use OR	For this credit 'office areas' means all occupied supporting functions. Where no diesel backup generation is specified in the project, or where ambient temperatures are high enough such that generator pre-heaters are not required, this requirement relates to the supply of heat to supporting functions only. The credit may also be awarded where waste heat is converted into cooling via e.g. absorption chillers.				**1**	**-**
6.4.15	Use computer room waste heat to warm office, generator and fuel storage areas						
3	Re-use waste heat outside of the data centre facility boundary which exports a meaningful (5% or more) of waste heat into an external facility or district network.	Waste heat generation should be based on projected data hall occupancy and utilisation rates for 12 months after occupation.				**-**	**2**

Total	**18**	**4**
Achieved		

Transport

This category encourages better access to sustainable means of transport for building users. For a data centre this is largely focused on the commuting needs of staff. However, even where there are no supporting functions there remains a requirement for transportation links for deliveries and to allow personnel to visit and maintain systems in unmanned facilities.

No supporting functions:
Criteria not applicable to an unoccupied facility are filtered out. The weighting of the Transport category will be significantly reduced.
Small supporting functions:
The weighting of the Transport category will be reduced.
Large supporting functions:
The weighting of the Transport category is unchanged.

Credit or Reference	Available Credits								Criteria + Amendments
	Shell Core			Fully Fitted			SC	FF	
	No	Sm	Lg	No	Sm	Lg	Exp		
Tra 01 Public transport accessibility									
Accessibility index	**1**	**3**	**3**	**1**	**3**	**3**	**-**	**-**	The building classification is 'Office'. **No supporting functions:** One credit is available for an AI of ≥2.
Dedicated bus service	**1**	**1**	**1**	**1**	**1**	**1**	**-**	**-**	
Tra 02 Proximity to amenities									
-	**-**	**1**	**1**	**-**	**1**	**1**	**-**	**-**	
Tra 3a Alternative modes of transport									
-	**-**	**2**	**2**	**-**	**2**	**2**	**-**	**-**	
Tra 04 Maximum car parking capacity									
Car parking capacity	-	-	-	-	-	-	-	-	**Issue N/A**
Tra 05 Travel plan									
-	**1**	**1**	**1**	**1**	**1**	**1**	**-**	**-**	Relevant parts of criteria 2a - 2f may be excluded where justification is provided that requirements are not relevant to data centre staff or users. **Additional DS evidence:** Written justifications for exclusions to criteria (if required). **Additional PCR evidence:** As above.
Tra 06 Home office									
-	-	-	-	-	-	-	-	-	**Issue N/A**
Sum	**3**	**8**	**8**	**3**	**8**	**8**	**0**	**0**	

Water

The water category has been re-written to consider data centre water use as an industrial process, and largely replaces the water category in the main manual. Please refer to the Annex 1 - Revised Issues for full details.

Open loop cooling system (any size of supporting function):
All water criteria are applicable. Water weighting increased.
Closed loop cooling system with large supporting functions:
Wat 01, 02, 04 are applicable. Standard water weighting.
Closed loop cooling system with small / no supporting functions:
Wat 01, 02, 04 are applicable. Reduced water weighting.

Credit or Reference	Credits				Criteria + Amendments
	Std		Exp		
	CL	OL	CL	OL	
Wat 01 Water consumption					
-	**5**	**min std**	**1**	**-**	**This issue applies to supporting functions only** Assess supporting functions against the main manual using the Alternative method. **DCs with open loop cooling:** No credits are scored in this issue, however supporting functions must achieve performance level equivalent to 1 credit to achieve minimum standard of 'Good, and 2 credits to achieve 'Outstanding'. Exclude contribution of rainwater or greywater systems. The contribution of rainwater harvesting and greywater harvesting as an industrial process is assessed in Wat 06 Alternative Water Sources. **DCs with closed loop cooling:** 5 credits available as per the main manual. Include rainwater / greywater harvesting for off-setting sanitary use as per standard criteria. **Evidence**: See the technical manual.
Wat 02 Water monitoring					
Metering and monitoring	**1**	**2**	**-**	**-**	**Revised issue:** See Annex 1 - Revised Issues for requirements.
Wat 03 Water leak detection					
Leak detection system	-	-	-	-	This issue has been integrated into Wat 02.
Flow control devices	-	-	-	-	
Wat 04 Water efficient equipment					
-	**1**	**1**	**-**	**-**	**Open loop:** See Annex 1 - Revised Issues for requirements. **Closed loop:** Follow the standard criteria in the technical manual.

Wat 05 Shared water challenge					
Stakeholder identification and engagement	-	2	-	-	**New issue:** See Annex 1 - Revised Issues for requirements.
Water risk report	-	1	-	-	
Data centre location	-	1	-	-	

Wat 06 Alternative water sources					
Feasibility	-	1			**New issue:** See Annex 1 - Revised Issues for requirements.
Rainwater harvesting	-	1	-	-	
Alternative water source	-	-	-	up to 2	

Sum	7	9	1	2

Materials

Credit or Reference	Credits		Criteria + Amendments
	Std	Exp	
Mat 01 Life cycle impacts			
-	**5**	**1**	The assessment is classed as an 'Other building'. **LCA minimum capabilities:** The chosen LCA software must have the capability to carry out LCA of: - Heat source, space heating, air conditioning, ventilation (e.g. supporting function and data hall M&E systems). - Communication, security and control systems (e.g. networking and security infrastructure). - Electrical installations (e.g. distribution, switchgear, UPS, standby backup generation and any connected private wire renewable generation installations) LCA without these capabilities will not score credits in this issue. Detailed capabilities will differ according to software, the above descriptions are a general guide to the kinds of systems covered. As of this release, the following BREEAM approved LCA tools which currently fulfill this requirement are: **ByggLCA** **Conpact** **OneClick LCA [Int, ES, NOR, SE] and [IES]** **SBS Building Sustainability**
Environmental product declarations	**1**	**-**	
Exemplary level criteria	**-**	**1**	
Mat 02 Hard landscaping and boundary protection			
-	-	-	Not assessed as a standalone issue within SD233: BREEAM International New Construction 2016, but incorporated within the Mat 01 Life cycle impacts issue.
Mat 03 Responsible sourcing of construction products			
Sustainable Procurement Plan	**1**	**-**	
Responsible sourcing of construction products	**3**	**1**	
Mat 04 Insulation			
-	-	-	Not assessed as a standalone issue within SD233: BREEAM International New Construction 2016, but incorporated within Mat 01 Life cycle impacts and Mat 03 Responsible sourcing of construction products issues.
Mat 05 Designing for durability and resilience			

-	**1**	**-**	

Mat 06 Material efficiency			
-	**1**	**-**	

Sum	**12**	**3**

Waste

Credit or Reference	Credits		Criteria + Amendments
	Std	Exp	
Wst 01 Construction waste management			
Construction waste reduction	**2**	**-**	
Diversion of resources from landfill	**1**	**-**	
Exemplary level criteria	**-**	**1**	
Wst 02 Recycled aggregates			
-	**1**	**-**	
Exemplary level criteria	**-**	**1**	
Wst 03a operational waste			
-	**1**	**-**	In addition to recyclable waste streams, dedicated space is provided for the segregation and secure storage of e-waste in accordance with criterion 1. This requirement may be omitted where evidence is provided of over-riding security considerations.
Wst 04 Speculative finishes			
-	-	-	Issue N/A
Wst 05 Adaptation to climate change			
Structural and fabric resilience	**1**	**-**	
M&E resilience	**1**	**-**	**New credit:** In addition to structural and fabric resilience, at or before technical design stage the risk assessment demonstrates that the M&E system can be adapted to ensure that the data hall stays within allowable temperature and humidity ranges from projected climate change over the rated life-time of the building, without resulting in an over-sized system for current anticipated loads. The strategy should outline how such adaptation is achieved and cross reference this with relevant climate data projections. **Additional DS evidence:** Climate data and calculations. Design specifications. Design strategy. **Additional PCR evidence:** BREEAM assessor's site inspection report and evidence confirming compliant installation.

Responding to climate change	**-**	**1**	To achieve this credit, the following requirements are met: **Hea 07 Hazards:** Hea 07 has been achieved (if applicable). **Ene 01 Reduction of energy use and carbon emissions:** Achieve ≥10 credits. **Ene 04 Low carbon design:** Achieve one or more of the following practices in Checklist A8: - 6.4.2 Installation of free cooling. - 6.4.9 Alternative cooling sources. - 3 Waste heat re-use system exporting heat outside DC boundary. **Wat 01 (closed loop only)**: Achieve three credits. **Wat 05 (loop cooling only):** Achieve the 'water risk report' credit. **Mat 05 Designing for durability and resilience:** Criterion 2 has been achieved **Pol 03 Surface water run-off:** - Flood risk - a minimum of one credit has been achieved - Surface water run-off - two credits have been achieved

Wst 06 Functional adaptability			
-	1	**-**	**CN3:** In addition to the items for consideration listed in the functional adaptation strategy study, the scalability and modularity of data centre: - Space - Power - Backup power - Cooling Should be considered to account for future changes in demand.

Sum	**8**	**3**

Land use and ecology

Credit or Reference	Credits		Criteria + Amendments
	Std	Exp	
LE 01 Site selection			
Previously occupied land	**2**	**-**	
Contaminated land	**1**	**-**	
LE 02 Ecological value of site and protection of ecological features			
Ecological value of site	**1**	**-**	
Protection of ecological features	**1**	**-**	
LE 03 Minimising impact on existing site ecology			
-	-	-	This issue is not applicable to SD233: BREEAM International New Construction 2016.
LE 04 Enhancing site ecology			
Ecologist's report + recommendations	**1**	**-**	
Increase in ecological value	**2**	**-**	
LE 05 Long term impact on biodiversity			
-	**2**	**-**	
LE 06 Freshwater ecology			
Good water quality	**1**	**-**	**New issue:** Refer to Annex 1 - Revised Issues for requirements.
Excellent water quality	**1**	**-**	
Fresh water recommendations	**1**	**-**	
Fresh water implementation	**1**	**-**	
Sum	**14**	**0**	

Pollution

Credit or Reference	Credits		Criteria + Amendments
	Std	Exp	
Pol 01 Impact of refrigerants			
No refrigerants	**4**	**-**	3 credits available if zero ODP is required by legislation.
OR achieve the following criteria			
Pre-requisite	**Y**	**-**	The pre-requisite only applies to cooling systems where electric compressors or ammonia are used.
Ozone depleting potential	**1**	**-**	This credit is applicable only where there legislation requiring the use of refrigerants with an ozone depleting potential (ODP) of zero does not exist in the country of assessment.
Impact of refrigerants	**2**	**-**	
Leak detection	**1**	**-**	
Pol 02 Nox emissions			
-	**-**	**-**	Issue N/A.
Pol 03 Surface water run-off			
Flood resilience	**2**	**-**	
Surface water run-off	**2**	**-**	
Minimising watercourse pollution	**1**	**-**	
Pol 04 reduction of night time light pollution			
-	**1**	**-**	
Pol 05 Reduction of noise pollution			
-	**1**	**-**	
Pol 06 Local air quality			
Control of emissions	**2**	**-**	**New issue:** See Annex 1 - Revised Issues for requirements.
Ultra low / zero emissions	**-**	**1**	
Sum	**17**	**1**	