

Scape Sustainability Appraisal



The following long list of items were discussed at the workshop in November with George Martin of Willmott Dixon and Tom Ridley-Thompson of SCAPE

Theme	Example KPIs	Individual sustainability issues	Evidence from Scape	Suggested Actions	Priority level (quick win + Importance: High / medium / low)
Cross cutting issues		Site selection	N/A	None	Low
		BREEAM	BREEAM and the 'Green Guide' have been reviewed in relation to the SCAPE building system	What is the target BREEAM score for Scape Buildings? What is the highest rating that has been achieved so far? Which credits represent 'Quick Wins' for Scape buildings? Create list of priority credits.	Medium - quick win
		DQI		Has DQI assessment been undertaken?	Low
		Sustainability Strategy		Are there any plans for a sustainability strategy? Compile list of existing sustainability initiatives	Low
		Considerate Constructors		Has the Considerate Constructors Scheme been used on any Scape projects? Consider specifying a minimum score under Considerate Constructors scheme	Medium
		Design Quality - CABE Review		It was suggested that CABE (Commission for Architecture in the Building Environment) - the government's design quality watchdog and an important stakeholder in BSF - should be invited to review the SCAPE system	High
		Measurement and reporting and environmental KPI's		SCAPE should put in place a number of eKPIs as part of its process (water, waste, carbon). These would start with the those that are easiest to measure. For example 'carbon': SCAPE could immediately start measuring carbon emissions from their construction sites, as well as longer term operational carbon and embodied carbon from buildings. (SEE COLUMN B FOR FURTHER DETAILS)	High - quick win
		Understanding the design		Create 'Plain English' Scape Design Guide: BSF stakeholders tend not to be technical (head teachers). For this reason basic, easy-to-read information on the SCAPE system needs to be provided. Ideally, this should be accompanied by 'interactive' scale models to enhance understanding (e.g. with removable building elements etc)	High- quick win.
		CLASP legacy	The CLASP legacy was seen as a negative by some. SCAPE should consider this if wanting to enter the BSF market.	SCAPE to decide on how it associates itself with (or dissociates itself from) the CLASP history.	High - quick win
Integration of ICT	None	Look at opportunities for the integration of ICT into the SCAPE process. In particular, identify opportunities for efficiencies through increased use of ICT.	High		
Building User Guide		Produce standard template for Building User Guide for Scape buildings. - This is being developed	Medium - quick win		
1. Carbon	Embodied Carbon Operational Carbon: kg/CO2e/year - per m2 - per employee - per visitor	Minimise and manage Carbon emissions from the construction process		Establish methodology to measure and record carbon emissions from on site construction activities. Set up a process to manage these carbon emissions.	High
		Metering/monitoring	Separate heat from electricity loads. Zoning to be on a room by room basis. Electrical loads to be separately metered- lighting, ICT, kitchens.	Confirm details of sub-metering / zoning. Set CO2 targets for Scape buildings (% improvement over Building Regs required to assess BREEAM credits). Do a comparison with the DEC / EPC.	High - quick win
		Standards - Passivehaus		Investigate further the Passivehaus system. Consider options for the incorporation of elements of Passivehaus design into the Scape system.	High
		Air tightness	Meeting building reg levels only	Put a plan in place to achieve Passivehaus levels for air tightness. (UK supply chain is not well set up to detail buildings to achieve airtightness levels of '1' from a current level of say 8)	Medium
		Improving Energy Efficiency	Consider the carbon hierarchy in terms of 'bang for buck' Cold bridging through foundations eliminated by perimeter insulation Walls have a max. U-value of 0.27 (Part L = 0.35); Roof options are around 0.15 (Part L = 0.25) Some potential to exploit thermal mass of concrete ground and upper floors Concrete floors with structural metal decking have the potential to incorporate under floor heating. Standardised window modules are used - double or triple glazing is possible.	Adopt the carbon hierarchy Identify further opportunities for improving energy efficiency through design modifications. Adopt a design strategy that will facilitate achieving EPC 'A' rated levels. Set targets for energy efficiency improvements.	High
		Use of Renewables	No reference to potential for renewables	What are local renewables targets for new developments? (i.e. Merton Rule) Explore options for including renewables within Scape designs - report on relevant options. Consider opportunities for incorporating renewables on 'exemplar' Scape building.	Medium

		Optimise embodied energy.	Scape is a 'lightweight', steel frame modular system - low embodied energy is implied but no specific information provided	Consider the compilation of comparative carbon inventory for Scape buildings compared to other buildings of similar function.	Medium
2. Waste	Total solid waste generated (kg) - per employee - per visitor - total catering waste - % recycled - % to landfill	Minimise construction waste Aim to achieve zero net waste using WRAP toolkit	Not seen Offsite production has advantages for minimising site waste	Engage with the WRAP toolkit Provide facilities for effective segregation during construction (min 6 waste streams) Set targets for the following: Reduction of waste to landfill Recycled content Dates to achieve 'zero net waste' waste recovery rates, site waste management plans	High
		Site Waste Management Plans / Monitoring Site Waste	SWMPs now mandatory on projects over £300,000	Draw up template for site waste management plans if not already done	High - inc above
		Minimise operational waste		Allow for dedicated areas for segregation and storage of waste streams.	High - quick win
		Packaging waste		Use suppliers who minimise packaging / take back packaging waste.	High - quick win
		Composting		Allow for composting facilities wherever feasible.	Medium
3. Materials	Paper Consumption - total (kg) Paper consumption - total (kg) - per employee - per visitor - % wasted - % recycled - % sustainably sourced	No materials which are toxic or harmful to human health or the environment		Review VOC content of all finishes and fittings Specify low VOC materials only	Medium
		Low-impact materials	Lightweight steel frame is a major factor in the economy of the building.	Conduct an embodied carbon study of steel used in Scape buildings. Steel embodied carbon levels are known but the range is large. All steel is supplied through Corus so this should be investigated.	High
		End of life- steel	Steel frame is used on the SCAPE system	Conduct a study to investigate the ease of disassembly of the steel frame at end of life. 'Bolts rather than 'welds'. This is a quick win. Consider improvements in 'design for demountability' of Scape system.	High - quick win
		Prefer locally sourced materials		Use locally sourced materials/products where possible Compile list of local suppliers	Medium. Investigate 'local pound' - Quick Win
		Prefer reclaimed, recycled and renewable materials		Consider the options for including recycled content. Set targets for increasing recycled content of Scape building elements.	
		Responsible Sourcing	Green Guide to Specification has been reviewed in relation to the Scape system and influences materials selection.	Use suppliers with an Environmental Management System (e.g. ISO 14001) Use timber only from certified sources (e.g. FSC)	
		Insulation materials	Insulation can be included in prefabricated panels at the factory. For pitched, tiled roof option, insulation is provided above and between timber rafters - details of materials not provided. Rockwool is used for brickwork external walls - insulation batts eliminate cold bridging. Where rooflights are used, they provide 'good' thermal performance.	Review all insulants to check GWP What other insulants used apart from rockwool? Investigate alternative insulation products with an improved environmental footprint (eg straw, hemp, warm cell , phase change materials).	High - quick win
		Robustness		Always specify robust materials and protection, where necessary, to protect vulnerable parts of the building such as areas exposed to high pedestrian traffic. Explore opportunities to improve robustness of design.	Medium
		Flooring		Avoid carpet. Ensure appropriate balance of durability, environmental impact and value.	Medium - quick win
4. Water	Total water consumption (litres) - per visitor - per staff Total harvested/ recycled Total discharge to sewer % consumption from recycled water Adopt eKPIS from the CE 'KPI zone.	Maximise water efficiency - hierarchy:			
		1. demand reduction (eco efficiency)		Use water-efficient sanitary fittings such as sensor taps, flow restrictors, waterless urinals, dual flush toilets, leak detection, shut off valves etc	High- quick win.
		2. rain water harvesting	Inc on all sites	Design buildings to incorporate options for rain water collection	High- quick win.
		3. grey water recycling. Black water not suitable.	Not used by SCAPE. Value for money reasons.	Monitor development in technology for grey water recycling. Consider feasibility for grey water recycling in future design revisions.	Low
		SUDS (Sustainable Urban Drainage Systems)		Use SUDS where possible (e.g. permeable paving, oil interceptors, swales, collection basins etc)	High- quick win
		Flooding		Only situate buildings in low flood risk areas	
		Flooding		Investigate a higher raft to reduce flood risk	High- quick win.
		Flooding- damage to SIPs panels	The make up of the SIPs panels means they are susceptible to major damage if the get we from flooding - expansion issues.	SCAPE to investigate alternative.	Medium
		Metering/monitoring		Use automatic pulsed output metering	Medium
Water use in construction - measurement and management	Currently not monitored	Put in place a system to monitor water consumption during the construction process.	High - quick win		
5. Ecology	Area ecologically valuable habitat (m2) Biodiversity monitoring Change in number of species	Protect and enhance ecological value of site	Green / brown roof options are possible for some Scape roof options	Include options for protecting / enhancing ecological value in design guide Promote and include green roofs wherever possible.	High- Quick win to inc green roofs on all projects
		Engage with 'Learning Through Landscapes' resources	No evidence	Learning Through Landscapes is a good source of design guidance that can maximise the use of the site from an education perspective.	High- quick win.
		Use of brownfield/ contaminated sites	SCAPE has no control over site selection	Prefer use of land which as been previously developed and has been contaminated	Medium (not always feasible to use contaminated sites)

6. Transport	% of employees arriving by - car - walking - bicycle - public transport Total air travel	Minimise reliance on private vehicles/ minimise car parking		Beyond scope of Scape's involvement? Possible to mention in design guide?	Low
		Improve links to Public Transport		Beyond scope of Scape's involvement? Possible to mention in design guide?	Low
		Provide facilities for cyclists		Explore opportunities for provision of shower/ changing facilities. SCAPE should have 3-4 pre designed options.	High- quick win
		Minimise risk to pedestrians and cyclists		Design site layout to minimise risks to pedestrians and cyclists: provide crossings and separate lanes	Low
		Construction Traffic		Monitor truck movements and distances travelled	Medium - quick win
7. Culture & Heritage	Partnerships with local groups	Protect and build on local cultural heritage and diversity	None	Calculate local job creation / number of apprentices in the region as a result of SCAPE activities.	High- quick win
		Local economy.		Calculate the benefits to the local economy	Medium
8. Equity & Fair Trade	Equal opportunities policies H&S laws observed	Community Impact		Promote/engage in community consultation where possible.	
9. Food	% catering from local, organic or fair trade suppliers	Support local and low impact food production.	None	Use locally sourced, organic, fair trade food/drink supplies whenever possible.	High- quick win.
		Composting		Allow for dedicated areas for composting kitchen food waste on site	High- quick win.
10. Health & Happiness	Level of staff and user satisfaction Emergency procedures in place Accident/ near miss statistics Indoor air quality	Thermal comfort	Thermal modelling studies have indicated good performance in terms of thermal comfort levels. There is scope to exploit the thermal mass within concrete ground and upper floors. However, the lightweight nature of the system presents some limitations.	Explore the potential for phase change materials further. Conduct a Post Occupancy Evaluation using the DQI process	High (POE)
		Fresh air and ventilation	Scape buildings comply with BB101 (ventilation performance standards for teaching spaces). There is a range of solutions from full natural ventilation to air-conditioning - however, full natural ventilation will only be possible on a limited range of sites. MVHR has been identified as the most appropriate ventilation strategy in an independent study by Encraft on a specific school building. A study by WSP has shown that cross flow natural ventilation, with openable window on two facades, can achieve reasonable internal conditions with regard to air quality and thermal comfort.	Have infiltration/pressure tests been carried out? What are the opportunities for cross ventilation? Are windows openable? Conduct a Post Occupancy Evaluation using the DQI process Maximise opportunities for natural ventilation in future design revisions.	High (POE)
		Daylighting	High levels of natural daylight are available in Scape buildings - implications of building plans and orientation are understood A study by WSP has shown that reasonable daylight levels can be achieved	Conduct a Post Occupancy Evaluation using the DQI process	High (POE)
		Occupant controls	None	Include possibility of occupant control shading	High inc above - quick win
		Solar shading	None	What are the opportunities of incorporating solar shading into Scape systems?	High inc above - quick win
		Noise attenuation		Engage acoustic consultant to assess Scape buildings	High inc above
		Accessibility		Are all areas wheelchair accessible?	High inc above
		Building as a learning tool	None	SCAPE to investigate ways that the building elements can be used as learning tool- metering data, cutaways to see building details, insulation, manuals etc. CREATE have a useful system. Consider also the use of demonstration renewables even if not economically viable. Energy displays in prominent areas. Look also at One Planet Schools system. Look also at the use of the DQI process.	High- quick win
		Legionella		Risk of waterborne and airborne legionella contamination should be minimised. Has Scape addressed this?	High- quick win
		11. Whole Life Value	Planned preventive maintenance plans in place Use of LCC principles to optimise balance of costs	Whole Life Costing	The CLASP system, the predecessor to Scape, is on course to meet its 60-year design life.
	Undertake a whole life costing analysis of the expected 'top 10' elements- eg lighting systems, finishes, cladding systems, rooves, doors, heating systems.			Undertake WLC exercise using 15686 standard.	High
Maintainability	As with CLASP, components of the Scape system are also selected to minimise maintenance/operational costs (e.g. aluminium double-glazed windows, acoustic and thermal performance, flexible partitioning, robust ironmongery, factory finished doors etc)			Buildings should be design for ease and efficiency of maintenance - i.e. materials should be specified that are durable and easy to clean.	
		Capital Costs	SCAPE and WD are doing capital cost benchmarking. Need to move this to WLC benchmarking and adopt the ISO15686 standard	Move from capex thinking only to life cycle costing using the ISO 15686 as the structure.	High
		Performance related pay	Consider a system of rewarding the supply chain and being paid based on sustainability performance. For eg if a building achieves a EPC rating of 'A' then are there ways the supply chain could be incentivised to achieve this?	Investigate incentivising based on sustainability performance of the product	medium