the SBAT

sustainable building assessment tool becomes an key issue in the way we live and work. Buildings can play an important role in supporting sustainability. This is done through careful planning in which design decisions, material specifications and so on are carefully evaluated in terms of their long term impact on the economic, social and environmental sustainability of a society and the natural environment.

The Sustainable Building Assessment Tool (SBAT) has been designed to help evaluate the sustainability of buildings. This is done by assessing the performance of a building in relation to a number of economic, social and environmental criteria. The tool has been designed to be particularly appropriate for use in developing countries and therefore includes aspects such as the impact of the building on the local economy, as economic issues are often a priority.

The SBAT tool is used in design stages of a new building. It is designed to encourage the development of more sustainable buildings by enabling different options to be evaluated rapidly and compared. The tool also enables a building to be rated in terms of its sustainability. This enables buildings to be compared to each other and to benchmarks.

in this thesis, the SBAT tool is used as: A way of ensuring that policies on sustainability are implemented and integrated into the construction environment.

In conclusion the building according to the outcomes and benchmarks of the SBAT in figure? is sustainable, it fulfills all the regired standards set by the tool to assess the building.

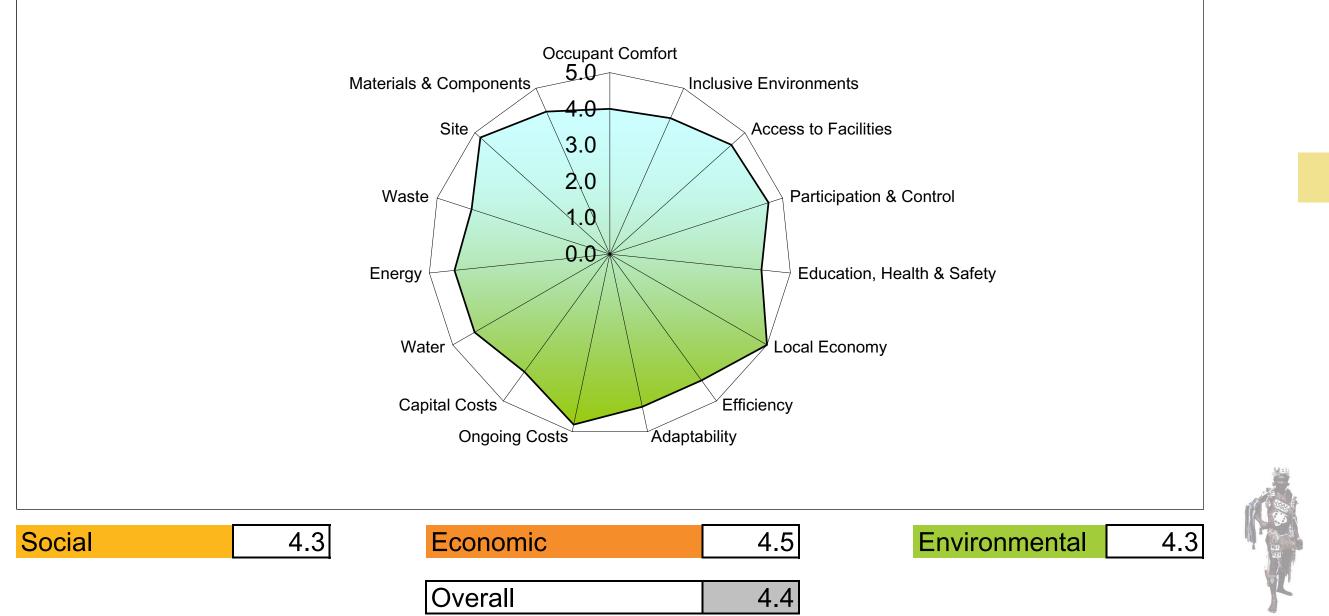
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Non-renewable resources are being depleted and there is increasing environmental damage as a result of human activities. It is therefore increasingly important that this is addressed, and sustainability

SUSTAINABLE BUILDING ASSESSMENT TOOL (SBAT- P) V1

PROJECT	ASSE
Project title: The research centre for indigenous traditional medicines	Date:
Location: Pretoria, Marabastad	Unde
Building type (specify): Community and Commercial	Comp
Internal area (m2):	Telep
Number of users:	Email
Building life cycle stage (specify): Design	





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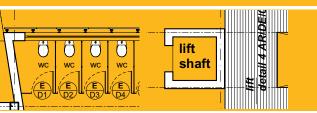


Criteria Notes

Reference	Criteria	Description	E
SO1	Occupant Comfort	The quality of environments in and around buildings has been shown to have a direct impact on health, happiness and productivity of people. Healthier, happier, more effective people contribute to sustainability by being more efficient and therefore reducing resource consumption and waste.	
SO2	Inclusive Environments	Buildings should be designed to accommodate and be accessible to everyone, or specially designed buildings need to be provided. Ensuring that buildings are inclusive supports sustainability as replication is avoided and change of use supported. It also ensures that as legislation in this area tightens, expensive retrofits are not required in order to ensure compliance	
SO3	Access to Facilities	Conventional living and working patterns require regular access to a range of services. Ensuring that these services can be accessed easily and in environmentally friendly ways supports sustainability by increasing efficiency and reducing environmental impact.	
SO4	Participation & Control	Enablingusers to participate in decisions about their environment helps ensure that they care for and manage this properly. Control over aspects of their local environment enables personal satisfaction and comfort. Both of these support sustainability by promoting proper management of buildings and increasing productivity.	
SO5	Education Health and Safety	Buildings need to cater for the well-being, development, health and safety of the people that use them Learning and access to information is increasingly seen as a requirement of a competitive work force. All of these factors contribute to sustainability by helping ensure that people remain healthy and economically active, thus reducing the 'costs' (to society, the environment and the economy) of unemployment and ill health.	

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Examples of quantified performance indicators



	Criteria	Indicative performance measure		Points
SO 1	Occupant Comfort	Explanatory notes		4.0
SO 1.1	Daylighting	% of occupied spaces that are within distance 2H from window, where H is the height of the window or where there is good daylight from skylights	80	0.8
SO 1.2	Ventilation	% of occupied spaces have equivalent of opening window area equivalent to 10% of floor area or adequate mechanical system, with upolluted air source	80	0.8
SO 1.3	Noise	% of occupied spaces where external/internal/reverberation noise does not impinge on normal conversation (50dbA)	80	0.8
SO 1.5	Thermal comfort	Tempreture of occupied space does not exceed 28 or go below 19 $_{ m o}$ C for less than 5 days per year (100%)	80	0.8
SO 1.5	Views	% of occupied space that is 6m from an external window (not a skylight) with a view	80	0.8
SO 2	Inclusive Environmen	t Explanatory notes		4.1
SO 2.1	Public Transport	% of building (s) within 400m of disabled accessible (20%) and affordable (80%) public transport	90	0.9
SO 2.2	Information	Comprehensive signage provided (50%), Signage high contrast, clear print signage in appropriate locations and language(s) / use of understandable symbols / manned reception at all entrances (50%)	80	0.8
SO 2.3	Space	% of occupied spaces that are accessible to ambulant disabled / wheelchair users	80	0.8
SO 2.4	Toilets	% of occupied space with fully accessible toilets within 50m along easily accessible route	80	0.8
SO 2.5	Fittings & Furniture	% of commonly used furniture and fittings (reception desk, kitchenette, auditorium) fully accessible	80	0.8
SO 3	Access to Facilities	Explanatory notes		4.5
SO 3.1	Children	All users can walk (100%) / use public transport (50%) to get to their childrens' schools and creches	90	0.9
SO 3.2	Banking	All users can walk (100%) / use public transport (50%) to get to banking facilities	90	0.9
SO 3.3	Retail	All users can walk (100%) / use public transport (50%) to get to food retail	90	0.9
SO 3.4	Communication	All users can walk (100%) / use public transport (50%) to get to communication facilities (post/telephone/internet)	90	0.9
SO 3.5	Exercise	All users can walk (100%) / use public transport (50%) to get to recreation/excercise facilities	90	0.9
SO 4	Participation & Control	Explanatory notes		4.6
SO 4.1	Environmental control	% of occupied space able to control their thermal environment (adjacent to openable windows/thermal controls)	90	0.9
SO 4.2	Lighting control	% of occupied space able to control their light (adjacent to controllable blinds etc/local lighting control)	90	0.9
SO 4.3	Social spaces	Social informal meeting spaces (parks / staff canteens / cafes) provided locally (within 400m) (100%)	100	1.0
SO 4.4	Sharing facilties	5% or more of facilities shared with other users / organisations on a weekly basis (100%)	100	1.0
SO 4.5	User group	Users actively involved in the design process (50%) / Active and representative management user group (50%)	80	0.8
SO 5	Education, Health & S	Explanatory notes		4.2
SO 5.1	Education	Two percent or more space/facilities available for education (seminar rooms / reading / libraries) per occupied space (75%). Construction training provided on site (25%)	100	1.0
SO 5.2	Safety	All well used routes in and around building well lit (25%), all routes in and around buildings visually supervised (25%), secure perimeter and access control (50%), No crime (100%)	80	0.8
SO 5.3	Awareness	% of users who can access information on health & safety issues (ie HIV/AIDS), training and employment opportunities easily (posters/personnel/intranet site)	80	0.8
SO 5.4	Materials	All materials/components used have no negative effects on indoor air quality (100%)	80	0.8
	Accidents	Process in place for recording all occupational accidents and diseases and addressing these	80	0.8

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Criteria Notes

Reference	Criteria	Description	Examples o
EC1	Local Economy	The construction and management of buildings can have a major impact on the economy of an area. The economy of an area can be stimulated and sustained by buildings that make use of, and develop, local skills and resources.	,
EC2	Efficiency	Buildings cost money and make use of resources whether they are used or not. Effective and efficient use of buildings supports sustainability by reducing waste and the need for additional buildings.	
EC3	Adaptability and Flexibility	Most buildings can have a life span of at least 50 years. It is likely that within this time the use of the building will change, or that the feasibility of this will be investigated. Buildings, which can accommodate change easily, support sustainability by reducing the requirement for physical adaptation and associated disruption, energy consumption and cost as well as the need for new buildings.	
EC4	Ongoing Costs	Building cost money to operate. These costs include cleaning, maintenance, security and energy. These costs are often indicative of consumption and waste in the building. It is therefore important to monitor them. In addition operational budgets can be used to support the development of local economies.	
EC5	Capital Costs	Buildings are generally one of the most valuable assets that people, and often organisations and governments own. Money spent on buildings is not available for other uses such as health, education and business development. In addition, expensive buildings may mean that the services (i.e. health and education) they contain or the accommodation (for work and living) they provide is beyond the means of most users.	

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		Criteria	Indicative performance measure
	EC 1	Local economy	
	EC 1.1 EC 1.2	Local contractors Local materials	% value of the building constructed by local (within 50km) small (empl % of materials (sand, bricks, blocks, roofing material) sourced from wi
	EC 1.3	Local components	% of components (windows, doors etc) made locally (in the country)
	EC 1.4 EC 1.5	Local furniture/fittings Maintenance	% of furniture and fittings made locally (in the country) % of maintenance and repairs by value that can, and are undertaken,
_	EC 1.5		70 of maintenance and repairs by value that can, and are undertaken,
	EC 2.1	Efficiency Capacity	0/ conscituted by indiana used on a deily basis (actual number of users /
		Occupancy	% capacity of building used on a daily basis (actual number of users / % of time building is occupied and used (actual average number of ho used (24) *100)
	EC 2.3	Space per occupant	Space provision per user not more than 10% above national average
		Communication	Site/building has access to internet and telephone (100%), telephone
of quantified performance indicators	EC 2.5	Material & Components	Building design coordinated with material / component sizes in order t (50%)
or quantimed performance indicators	EC 3	Adaptability	
	EC 3.1	Vertical heights	% of spaces that have a floor to ceiling height of 3000mm or more
	EC 3.2	External space	Design facilitates flexible external space use (100%)
	EC 3.3	Internal partition	Non loadbearing internal partitions that can be easily adapted (loose p (25%)
	EC 3.4	Modular planning	Building with modular stucture, envelope (fenestration) & services allo
		Furniture	Modular, limited variety furniture - can be easily configured for differen
	EC 4	Ongoing costs	
	EC 4.1 EC4.2	Induction Consumption & waste	All new users receive induction training on building systems (50%), De % of users exposed on a monthly basis to building performance figure accidents (25%)
e de la constante de la constan	EC 4.2	Metering	Easily monitored localised metering system for water (50%) and energy
en e	EC4.3	Maintenance & Cleaning	% of building that can be cleaned and maintained easily and safely us materials
	SO 4.5	Procurement	% of value of all materials/equipment used in the building on a daily ba manufacturers
	EC 5	Capital Costs	
	EC 5.1	Local need	Five percent capital cost allocated to address urgent local issues (emprocess (100%)
	EC5.2	Procurement	Tender / construction packaged to ensure involvement of small local of
	EC 5.3	Building costs	Capital cost not more than fifteen % above national average building of
	EC5.4	Technology	3% or more of capital costs allocated to new sustainable/indigenous to
	EC 5.5	Existing Buildings	Existing buildings reused (100%)

	Measured	Points	
Explanatory notes		5.0	
ployees<20) contractors	100		
<i>v</i> ithin 50km	100	1.0	
	100	1.0	
	100	1.0	
, by local contractors (within 50km)	100	1.0	
Explanatory notes		4.3	
/ number of users at full capacity*100)	80	0.8	
ours used / all potential hours building could be	50	0.5	
for building type (100%)	100	1.0	
e for building type (100%) e only (50%)	100		
to minimise wastage. Walls (50%), Roof and floors	100		
to minimise wastage. Wails (50 %), Roof and hoors	100	1.0	
Explanatory notes		4.4	
	80		
	100	1.0	6
partioning (100%), studwall (50%), masonary	80	0.8	
owing easly internal adaptaptation (100%)	80	0.8	
nt uses (100%)	100		
Explanatory notes		4.8	
Detailed building user manual (50%)	100	-	
es (water (25%), electricity (25%), waste (25%),	80	0.8	
-gy (50%)	100	1.0	
sing simple equipment and local non-hazardous	100		
basis supplied by local (within the country)	100	1.0	
Explanatory notes		4.0	
ployment, training etc) during construction	100	A A	
contractors/manufacturers (100%)	100	1.0	
costs for the building type (100%)	100	¹³⁰ 1 0	

costs for the building type (100%) technology (100%)

100 1.0 1.0 100 0.0 0

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		της 2βαι				
		sustainable building assesment tool	Criteria	Indicative performance measure	Measured Po	oints
			EN 1 Water	Explanatory note	<u>S</u>	4.3
Criteria Notes		EN 1.1 Rainwater	% of water consumed sourced from rainwater harvested on site	80	0.8	
			EN 1.2 Water use	% of equipment (taps, washing machines, urinals showerheads) that are water efficient	100	1.0
Poforonce	e Criteria	Description Examples of quantified performance	EN 1.3 Runoff	% of carparking, paths, roads and roofs that have absorbant/semi absorbant/permeable surfaces	100	1.0
				(grassed/thatched/looselaid paving/ absorbant materials)		<u> </u>
EN1	Water	The large-scale provision of conventional water supply has many environmental implications. Water	EN 1.4 Greywater	% of water from washing/relatively clean processes recycled and reused	50	0.5
		needs to be stored (sometimes taking up large areas of valuable land and disturbing natural drainage	EN 1.5 Planting	% of planting (other than food gardens) on site with low / appropriate water requirements	100	1.0
		patterns with associated problems from erosion etc); it also needs to be pumped (using energy) through a large network of pipes (that need to be maintained and repaired). Having delivered the	EN 2 Energy	Explanatory note	<u>s</u>	4.3
		water, parallel efforts are then required to dispose of this after it is used in reticulation and sewerage	EN 2.1 Location	% of users who walk / cycle / use public transport to commute to the building	100	1.0
		systems. Reducing water consumption supports sustainability by reducing the environmental impact	EN 2.2 Ventilation	% of building ventilation requirements met through natural / passive ventilation	80	0.8
		required to deliver water, and dispose of this after use. Maintaining natural ground water systems also	EN 2.3 Heating & Cooling	% of occupied space which relies solely on passive environmental control (no or minimal energy consumption)	80	0.8
		supports sustainability through maintaining existing ecosystems and avoiding the environmental	EN 2.4 Appliances & fittings	% of appliances / lighting fixtures that are classed as highly energy efficient (ie energy star rating)	90	0.9
		impact associated with for disposal of storm water and runoff.	EN 2.5 Renewable energy	% of building energy requirements met from renewable sources	80	0.8
EN2	Energy	Buildings consume a large proportion of all energy produced. Conventional energy production is	EN 3 Waste	Explanatory note	<u>S</u>	4.0
	Lifergy	responsible for making a large contribution to environmental damage and non-renewable resource	EN 3.1 Toxic waste	% of toxic waste (batteries, ink cartridges, flourescent lamps) recycled	100	1.0 68
		depletion. Using less energy or using renewable energy in buildings therefore can make a substantial	EN 3.2 Organic waste	% of organic waste recycled	100	1.0
		contribution	EN 3.3 Inorganic waste	% of inorganic waste recycled.	100	1.0
EN3	Waste	Raw materials and new components used in buildings consume resources and energy in their	EN 3.4 Sewerage	% of sewerage recycled on site	20	0.2
Litto	Wallo	manufacture and processes. Buildings accommodate activities that consume large amounts of	EN 3.5 Construction waste	% of damaged building materials / waste developed in construction recycled on site	80	0.8
		resources and products and produce large amounts of waste. Reducing the use of new materials and	EN 4 Site	Explanatory note	<u>s</u>	4.8
		components in buildings and in the activities accommodated and reducing waste by recycling and	EN 4.1 Brownfield site	% of proposed site already disturbed / brownfield (previously developed)	100	1.0
		reuse supports sustainability by reducing the energy consumption and resource consumption.	EN 4.2 Neighbouring buildings	s No neighbouring buildings negatively affected (access to sunlight, daylight, ventilation) (100%)	100	1.0
FN4	Site	Buildings have a footprint and a size that take up space that could otherwise be occupied by natural	EN 4.3 Vegetation	% of area of area covered in vegetation (include green roofs, internal planting) relative to whole site	100	1.0
		ecosystems which contribute to sustainability by helping create and maintain an environment that	EN 4.4 Food gardens	Food gardens on site (100%)	100	1.0
		supports life. (By, for instance, controlling the carbon dioxide and oxygen balance and maintaining	EN 4.5 Landscape inputs	% of landscape that does not require mechanical equipment (ie lawn cutting) and or artificial inputs such as weed	80	0.8
		temperatures within a limited range). Buildings can support sustainability by, limiting development to		killers and pesticides		1
		sites that have already been disturbed, and working with nature by including aspects of natural	EN 5 Materials & Compone	en <u>Explanatory note</u>	s	4.3
		ecosystems within the development.	EN 5.1 Embodied energy	Materials with high embodied energy (aluminium,plastics) make up less than 1% of weight of building (100%)	100	1.0
EN5	Materials and	d The construction of buildings usually requires large quantities of materials and components. These	EN 5.2 Material sources	% of materials and components by volume from grown sources (animal/plant)	80 80	0.8
	Components		EN 5.3 Ozone depletion	No materials and components used requiring ozone depleting processes (100%)	80	0.8
	Componento	are harmful to the environment and consume non-renewable resources. It is therefore important to	EN 5.4 Recyled / reuse	% of materials and components (by weight) reused / from recycled sources	80	0.8
		carefully select materials and components and construction methods.	EN 5.5 Construction process	Volume / area of site disturbed during construction less than 2X volume/area of new building (100%)	90	0.9
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