Stellendale Village Footprint
Based on show house at Newlands

11 April 2008

VISUAL
eiendomsontwikkelaars • property developers

Element	Baseline	Stellendale	Stellendale Green

ENERGY

Element	units	hours usage	Specification	w	impact (kWh)	Specification	w	impact (kWh)	Specification	w	impact (kWh)	Comment	Additional Cost
Lights	8	150	Incandecent lights	60	72	Energy saver lights (CFLs)	11	13.2	Energy saver lights (CFLs)	11	13.2	Implement CFL as standard procedure	None
Cooking	1	60	Standard stove with solid plates	3000	180	Bosch stove with solid plates	3000	180	Gas stove with electric hob	1500	90	Gas stoves instead of electrc	R 2,000
Hot water geyser	1	132	150 liter hot water cylinder	3000	396	150 liter hot water cylinder	3000	396	Solar water geyser	1000	132	Solar geyser instead of electrc	R 6,000
Geyser timer	1	59.4	No geyser timer	3000	396	No geyser timer	3000	396	Geyser timer	3000	178.2	Implement geyser timer if not solar	R 350
Free cooking	1	30	None	0	0	None	0	0	Hot Box	-500	-15	Reduces the need for using stove	R 160
Energy usage per month (kWh)			Baseline in kWh / month		1044	Stellendale in kWh / month		985.2	Stellendale "Green" in kWh / month		398.4	Additional Cost per unit	R 8,510
Carbon emissions/month (kg CO2)			Baseline in kg CO2 per month		1128	Stellendale in kg CO2 / month		1064	Stellendale "Green" in kg CO2/month		430	Additional Cost for 987 units	R 8,399,370
						% of base line		94	% of base line		38		

WATER

Element	units	hours usage	Specification	litres	impact	Specification	litres	impact	Specification	litres	impact	Comment	Additional Cost
Taps	3	15	Normal taps with no aerators	20	900	Aerators on all handbasin taps	10	450	Aerators on all handbasin taps	6	270	Taps may not exceed 6l/min	None
Shower mixer	1	8	Standard shower mixer	22	176	Adaptable shower mixer	16	128	Adaptable low flow mixer	10	80	Shower may not exceed 10l/min	None
Toilets	2	30	Single flush toilets	9.5	570	Duel flush toilets	5	300	Duel flush toilets	5	300	Already in place	None
Layout	1	10	Inefficient layout often leading to dead leg & wastage of water	4	40	Rationalise plumbing to avoid dead leg, thus saving water	0	0	Rationalise plumbing to avoid dead leg and provide insulation	0	0	Plumbing is already done centrally	None
Pressure			Standard / high pressure			Standard / high pressure			Installation of pressure control valve for development as a whole			Pressure control at main valve can help reduce consumption through lower pressure. Currently 6 bar, but may reduce to 4 bar. CCR can install pressure control valve for the development as a whole.	Cost of Pressure Valve?
Rainwater harvesting	1	1	None	0	0	Water pipes currently flow into ground water, but pump has not yet been installed.	0	0	Rain water pipes flow back into ground water and pump installed to use ground water for irrigation	-500	-500	Naturally back into the ground and then ultimately pump back up for irrigation. Soak aways. Sandy areas. Irrigation controlled centrally. Refer to design report for civil services	Cost of pump?
Other			Each household gets 200 litres or 6.88 kl per month free water									Designated car wash bays with water trap 1 per block for high density developments.	None
Water usage per month (litres)			Baseline in litres		1686	Stellendale in litres		878	Stellendale "Green" in litres		150	Additional cost	
						% of base line		52	% of base line		9		

INSULATION

Element	Specification	impact	Specification	impact	Specification	impact	Comment	Cost
External walls	Generally cavity walls	Poor	Cavity external walls, plastered with Traditional Maxi Concrete Bricks	Good	Cavity external walls, plastered with Cape Brick	Good	Considered the cost, specs and long term feasibility, but decided to stay with Traditional	None
Windows	Windows often to not close tight	Poor	Anodised aluminium windows	Good	Anodised aluminium windows	Good	Already in place	None
Pipe insulation	No insulation on pipes	Poor	Uni-pipe unsed instead of insulation on pipes	Good	Uni-pipe unsed instead of insulation on pipes	Good	Already in place	None
Thermal roof insulation	No roof insulation	Poor	No roof insulation	Poor	Isotherm ceiling insulation	Good	Additional cost is R784 / unit for an average house of 55m2	R 773,808
General insulation on project	Baseline	Poor	Stellendale	Med	Stellendale "Green"	Good	Additional cost	R 773,808

FINISHES

Element	Specification	impact	Specification	impact	Specification	impact	Comment	Cost
External wall paint	Unclear, but often high VOCs	Neg	Exterior grade super acrylic PVA (water based with few volatiles)	Med	Natural water-based masonry sealer and wall paints	Good	Considered options, but decided to stay with Marmoran Tusk	None
Internal wall paint	Unclear, but often high VOCs	Neg	Plascon Polvin	Med	Natural water-based masonry sealer and wall paints	Good	Considered options, but decided to stay with Marmoran Tusk	None
Wood sealer	Unclear, but often high VOCs	Neg	Varnished - Weather Guard	Med	Natural wood sealer	Good	Considered options, but decided to stay Weather Guard	None
Driveways	Hard landscaping	Neg	restrict hard landscaping	Good	resctrict hard landscaping	Good	Allow the water to seep into ground	None
General finishes on project	Baseline	Neg	Stellendale	Med	Stellendale "Green"	Good	Additional cost	None

Stellendale Village Footprint
Public Area

Element			Baseline			Stellendale			Stellendale Green		
ENERGY											
Element	**units**	**hours usage**	**specification**	**w**	**impact (kWh)**	**specification**	**w**	**impact (kWh)**	**specification**	**w**	**impact (kWh)**
Street lights	100	300	Incandecent lights	80	2400	HPS with reflectors	50	1500	HPS with reflectors	50	1500
Comparison			Baseline in kWh		2400	Stellendale in kWh		1500	Stellendale "Green" in kWh		1500
						Percentage of baseline		63	Percentage of baseline		63
WATER											
Element	**units**	**hours usage**	**specification**	**litres**	**impact**	**specification**	**litres**	**impact**	**specification**	**litres**	**impact**
Garden watering	1	30	Linked to municipal water	600	18000	Linked to municipal water	600	18000	Linked to borehold water	-600	-18000
Greywater re-use	1	30	None	200	6000	None	200	6000	Linked to garden watering	-200	-6000
Comparison of use of potable water			Baseline (litres of potable water)		24000	Stellendale (litres of potable water)		24000	Stellendale "Green" (l potable water)		-24000

LANDSCAPING

Indigenous trees are planted and only irrigated the first three years
Kikuya grass is used instead of natural ground cover (suurvye) due to high traffic of people and cars
All external taps placed internally at communicty centre.

Stellendale Village Footprint
Calculation for proposed extention (987 units)

Element	Baseline	Showhouse	"Green"	Comment

ENERGY

Element	Impact (MWh)			Comment
Lights	71.06	13.03	13.03	This can easily be achieved
Cooking (electricity vs gas)	177.66	177.66	88.83	This can be offered at client's cost
Hot water geyser	390.85	390.85	130.28	This is expensive but should be considered
Geyser timer	390.85	390.85	175.88	
Free cooking	0.00	0.00	-14.81	Minimal cost, but impact on electrical use
Energy usage per month (MWh)	1030.43	972.39	393.22	Energy impact can be significantly lowered
Carbon emissions/month (tons CO2)	1112.86	1050.18	424.68	Carbon footprint can be significantly lowered
Percentage of baseline		94%	38%	

WATER

Element	Impact (Kilo litres)			Comment
Taps	888.3	444.15	266.49	Already in place
Shower mixer	173.71	126.34	78.96	Already in place
Toilets	562.59	296.1	296.1	Already in place
Layout	39.48	0	0	Ensure most effective layout for each unit
Rainwater harvesting	0	0	-493.5	Borehole can only be sunk during last phase
Water usage per month (kilo litres)	1664.08	866.59	148.05	
Difference in kilo litres per month (or year)			1516.03	18192.38
Percentage of baseline		52%	9%	

INSULATION

Element	Impact of insulation			Comment
External walls	Poor	Good	Good	Cape Bricks considered, but too expensive
Windows	Poor	Good	Good	Already in place
Pipe insulation	Poor	Good	Good	Unipipe being used instead of copper
Thermal roof insulation	Poor	Poor	Good	Thermal roof insulation to be implemented
General insulation on project	Poor	Med	Good	Insulation can be improved even more, but orientation of unit and roof overhangs are critical elements

FINISHES

Element	Impact of finishes			Comment
External wall paint	Neg	Med	Good	Consider the environmental and health impacts
Internal wall paint	Neg	Med	Good	Consider the environmental and health impacts
Wood sealer	Neg	Med	Good	Consider the environmental and health impacts
Driveways	Neg	Good	Good	Permeable driveways already used in certain areas
Genral finishes on project	Neg	Med	Good	Different elements need to be considered prior to making final decision

TRANSPORT

Car pooling
Public transport
Shuttle to station
School shuttle

Stellendale Village Footprint
Different Energy Related Options

Element	Baseline	Stellendale	Stellendale Green

Option 1: Implement lights, gas stove, solar water geyster and geyser timer

Element	units	hours usage	Specification	w	impact (kWh)	Specification	w	impact (kWh)	Specification	w	impact (kWh)	Comment	Additional Cost
Lights	8	150	Incandecent lights	60	72	Energy saver lights (CFLs)	11	13.2	Energy saver lights (CFLs)	11	13.2	Implement CFL as standard procedure	None
Cooking	1	60	Standard stove with solid plates	3000	180	Bosch stove with solid plates	3000	180	Gas stove with electric hob	1500	90	Gas stoves instead of electrc	R 2,000
Hot water geyser	1	132	150 liter hot water cylinder	3000	396	150 liter hot water cylinder	3000	396	Solar water geyser	1000	132	Solar geyser instead of electrc	R 6,000
Geyser timer	1	59.4	No geyser timer	3000	396	No geyser timer	3000	396	Geyser timer	3000	178.2	Implement geyser timer if not solar	R 350
Energy usage per month (kWh)			Baseline in kWh / month		1044	Stellendale in kWh / month		985.2	Stellendale "Green" in kWh / month		413.4	Additional Cost per unit	R 8,350
Carbon emissions/month (kg CO2) based on electricity use			Baseline in kg CO2 per month		1128	Stellendale in kg CO2 / month		1064	Stellendale "Green" in kg CO2/month		446	Additional Cost for 987 units	R 8,241,450
						% of base line		94	% of base line		40		

Option 2: Implement only lights, gas stove and geyser timer

Element	units	hours usage	Specification	w	impact (kWh)	Specification	w	impact (kWh)	Specification	w	impact (kWh)	Comment	Additional Cost
Lights	8	150	Incandecent lights	60	72	Energy saver lights (CFLs)	11	13.2	Energy saver lights (CFLs)	11	13.2	Implement CFL as standard procedure	None
Cooking	1	60	Standard stove with solid plates	3000	180	Bosch stove with solid plates	3000	180	Gas stove with electric hob	1500	90	Gas stoves instead of electrc	R 2,000
Hot water geyser	1	132	150 liter hot water cylinder	3000	396	150 liter hot water cylinder	3000	396	150 litres hot water cylinder	3000	396	No solar water geyser	None
Geyser timer	1	59.4	No geyser timer	3000	396	No geyser timer	3000	396	Geyser timer	3000	178.2	Implement geyser timer if not solar	R 350
Energy usage per month (kWh)			Baseline in kWh / month		1044	Stellendale in kWh / month		985.2	Stellendale "Green" in kWh / month		677.4	Additional Cost per unit	R 2,350
Carbon emissions/month (kg CO2) based on electricity use			Baseline in kg CO2 per month		1128	Stellendale in kg CO2 / month		1064	Stellendale "Green" in kg CO2/month		732	Additional Cost for 987 units	R 2,319,450
						% of base line		94	% of base line		65		

Option 3: Implement only lights, solar water geyser with geyser timer

Element	units	hours usage	Specification	w	impact (kWh)	Specification	w	impact (kWh)	Specification	w	impact (kWh)	Comment	Additional Cost
Lights	8	150	Incandecent lights	60	72	Energy saver lights (CFLs)	11	13.2	Energy saver lights (CFLs)	11	13.2	Implement CFL as standard procedure	None
Cooking	1	60	Standard stove with solid plates	3000	180	Bosch stove with solid plates	3000	180	Bosh stove with solid plates	3000	180	Electric stove	None
Hot water geyser	1	132	150 liter hot water cylinder	3000	396	150 liter hot water cylinder	3000	396	Solar water geyser	1000	132	Solar geyser instead of electrc	R 6,000
Geyser timer	1	59.4	No geyser timer	3000	396	No geyser timer	3000	396	Geyser timer	3000	178.2	Geyser timer	R 350
Energy usage per month (kWh)			Baseline in kWh / month		1044	Stellendale in kWh / month		985.2	Stellendale "Green" in kWh / month		503.4	Additional Cost per unit	R 6,350
Carbon emissions/month (kg CO2) based on electricity use			Baseline in kg CO2 per month		1128	Stellendale in kg CO2 / month		1064	Stellendale "Green" in kg CO2/month		544	Additional Cost for 987 units	R 6,267,450
						% of base line		94	% of base line		48		

Stellendale Village Footprint

Notes

1. Specifications and schedule of finishes are based on phase 1, as well as a site inspection to the show house at Newlands
2. Assumptions relating to usage are based on the Smart Living Handbook for consistency.
3. A ratio of 1.08 is used for calculation of CO2 from electricity.
4. Average mid income household is 737kg of CO2, but that includes all additional electonics exlcuded from the building.
5. Some of the aspects (such as the distance of the dead leg) could not be measured as it depends on the individual unit design.
6. Some of the baseline specifications could not be specified off-hand
7. The public area needs more accurate calculations based on a specific audit of the area or accurate specifications for phase 2.
8. The extention calcuations are based on the showhouse with some adjustments for the size and numbers.
9. Costs comparison needs to be done between current products and proposed products taking economy of scale into account.

Notes of meeting

Transport
Waste, recycling options
Marketing - SWH strong marketing point
Smart Living Handbook for residents
Already outpricing ourselves as it is a good product, but still needs to be affordable

Concerned about is it sustainable for the long term for the culture we are servicing - don't make it too expensive
Better chances for approval at Stellendale 2 so no pressure on current price.
Larger mix (smaller, larger and flats) starting at at lower end might make it more viable
Centralised SWH system for servicing of flats - cost is pro rata
Standby for essential services (boom, security fencing, street lighting, etc).
Battery vs generator for standby system
don't market as green unless you really are
Roof overhangs - cost of eves etc, density of units, building lines, promote natural light
Must be contructable, sustainable… accountaiblity, demarcation, where, densification to allow for green ideas - design
Minimise was,te energy cnsumption, embodied energy, stormwater run off, min transport and max public transport
Economies of scale - max renewable energy should be used
Longterm carbon storage - plant six trees - for day to day generation of the house - Cape Nature Website
Good ideas vs human interventions - statuary requirements is biggest hurdle to sustainability
Find out what the direct routs is for getting funds from Escom to make this happen.
Check Visual / Vision
Credit / benefit vs cost for this development