Rapid Building System™

Thermal Comfort Performance Report

Prepared By:

Australian Energy Efficiency Consulting
P.O. Box 1011
Double Bay, NSW 1360
W: www.aenec.com.au
P: 0416 316 204
E: info@aenec.com.au

Rapid Building System™
Thermal Comfort Performance Report

This report has been prepared by:
Australian Energy Efficiency Consulting (AENEC)
P.O. Box 1011, Double Bay, NSW 1360
W: www.aenec.com.au **P:** 0416 316 204 **E:** info@aenec.com.au

Please read carefully the following important information:

Disclaimer

Scope Limitations: This thermal comfort report has been based on a semi-detached single level floor plan. The purpose of this report was to demonstrate numerically the performance obtained for the same floor plan by using three different types of building skin. It was simulated on all four orientations; N, S, E, W facing entry of building. In addition the same building was simulated in six different climate zones around Australia. In real situations, each climate zone requires different design parameters; however that is not in the scope of this report. The only adoption of this principle was the addition of insulation below the concrete slab in the cold climate zones. The software used to perform the simulations of this report was AccuRate Sustainability.

Exclusive Use: This report has been prepared for the exclusive use of AENEC's client to meet their particular objectives and by its nature is limited in scope. This material contained in this report should not be used for any other purpose or by other persons or entities without contacting AENEC. No warrantee is given in relation to the material in this report used for other purposes or by other persons or entities without the consent of AENEC.

Job Number:	AE205
Issue Date:	22 January 2013
Description:	**Rapid Building System™** Thermal Comfort Performance Report
Prepared By:	Dimitrios Harakidas; Mech. Engineer
Signed:	

Fabric	Location	North entry orientation	South entry orientation	East entry orientation	West entry orientation	Range of energy consumption MJ/m^2 annum
Brick Veneer R1.5 with R2.5 ceiling and Aluminum w/single Low E Glazing	Sydney 2166	7.1 stars	6.1 stars	6.9 stars	6.9 stars	85.4 - 63.9
	Darwin 800	6.8 stars	6.9 stars	7.1 stars	6.9 stars	298 - 277.1
	Hobart 7000	6.4 stars	5.7 stars	6.1 stars	6.1 stars	166.2 - 139.4
	Perth 6000	7.7 stars	6.9 stars	7.5 stars	7.6 stars	53.5 - 40.2
	Adelaide 5000	7.2 stars	6.7 stars	7.1 stars	7.1 stars	79.1 - 64.0
	Ballarat 3350	6.4 stars	6.1 stars	6.2 stars	6.3 stars	192.6 - 175.7

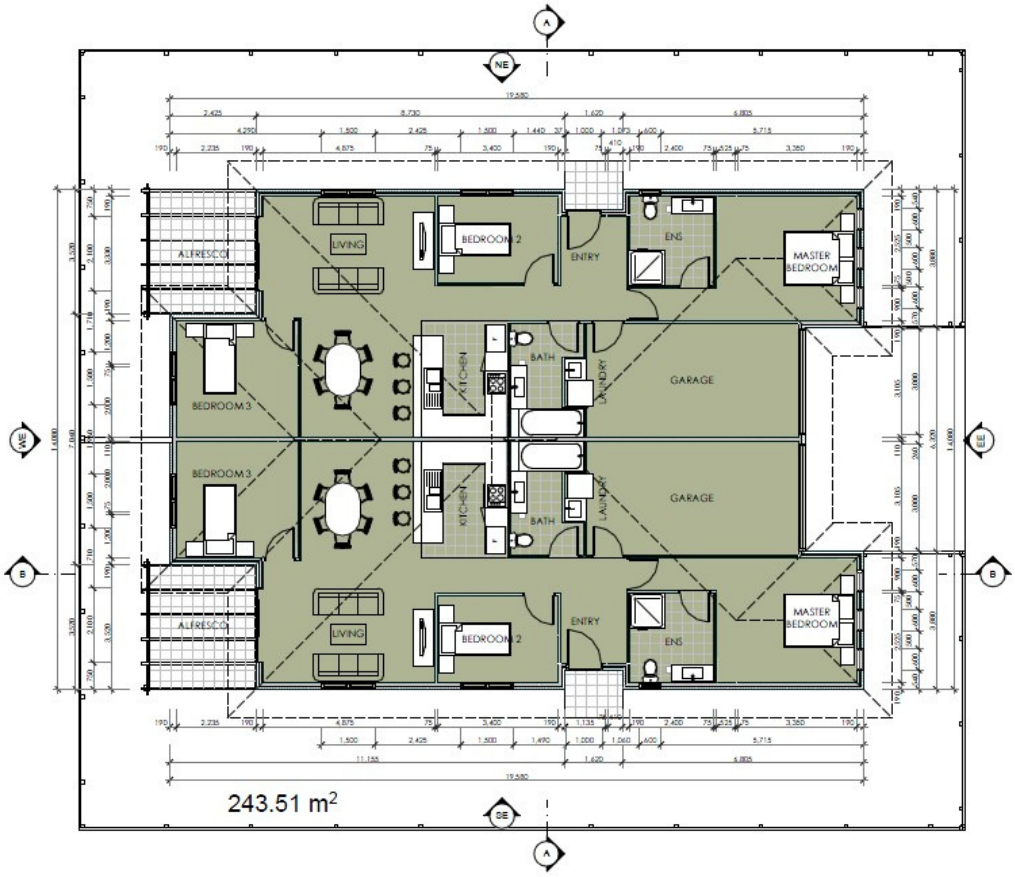
Fabric	Location	North entry orientation	South entry orientation	East entry orientation	West entry orientation	Range of energy consumption MJ/m2 annum
Cavity Brick R1.0 with R2.5 ceiling and Aluminum w/single Low E Glazing	Sydney 2166	7.1 stars	6.0 stars	6.9 stars	6.9 stars	86.5 - 62.9
	Darwin 800	6.8 stars	6.8 stars	7.1 stars	6.9 stars	296.5 - 278.2
	Hobart 7000	6.2 stars	5.6 stars	5.9 stars	5.9 stars	173.3 - 144.6
	Perth 6000	7.8 stars	7.0 stars	7.6 stars	7.7 stars	51.7 - 37.4
	Adelaide 5000	7.3 stars	6.6 stars	7.2 stars	7.1 stars	79.4 - 62.7
	Ballarat 3350	6.3 stars	5.9 stars	6.1 stars	6.1 stars	198.9 - 180.2

Fabric	Location	North entry orientation	South entry orientation	East entry orientation	West entry orientation	Range of energy consumption MJ/m2 annum
K.2 Standard house Rapid Building System™	Sydney 2166	8.3 stars	7.6 stars	8.2 stars	8.2 stars	52.6 - 37.5
	Darwin 800	7.0 stars	7.1 stars	7.4 stars	7.3 stars	282.4 - 258.0
	Hobart 7000	7.8 stars	7.3 stars	7.6 stars	7.7 stars	99.3 - 79.2
	Perth 6000	8.5 stars	8.2 stars	8.6 stars	8.4 stars	30.5 - 23.5
	Adelaide 5000	7.8 stars	7.3 stars	7.6 stars	7.7 stars	99.3 - 79.2
	Ballarat 3350	7.8 stars	7.4 stars	7.6 stars	7.7 stars	117.1 - 103.9

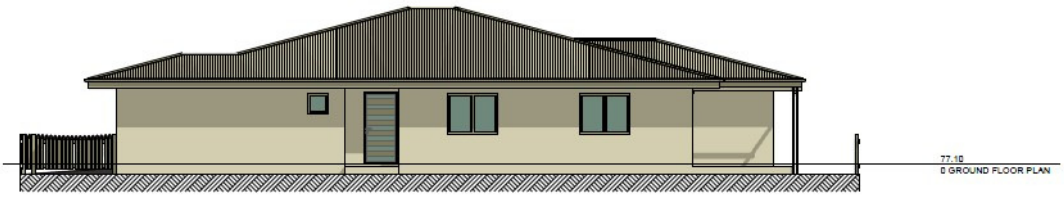
Assumptions:

1. The same building plan has been used in all simulations and the conditioned space is 86.9m2 in each dwelling
2. The brick veneer structure has wall insulation of R1.5 and ceiling insulation of R2.5
3. The cavity brick structure has wall insulation of R1.0 and ceiling insulation of R2.5
4. Glazing for brick veneer and cavity brick homes is Aluminium w/single Low E Glazing U=5.32 and SHGC=0.47
5. Rapid Building System™ house constructions are as per specifications from supplied from factory
6. For Hobart, Adelaide and Ballarat climate zones R2.0 insulation on slab on ground has been used in all designs
7. All external surfaces are of medium color
8. Neighbouring properties and fences have not been simulated and the exposure has been simulated as suburban

Drawings:



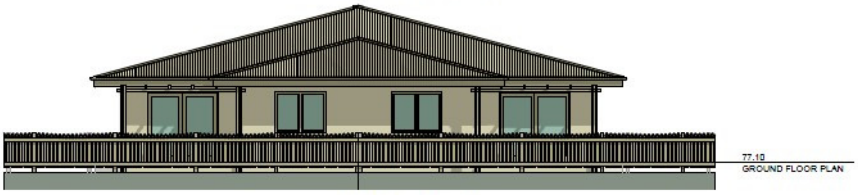
GROUND FLOOR PLAN



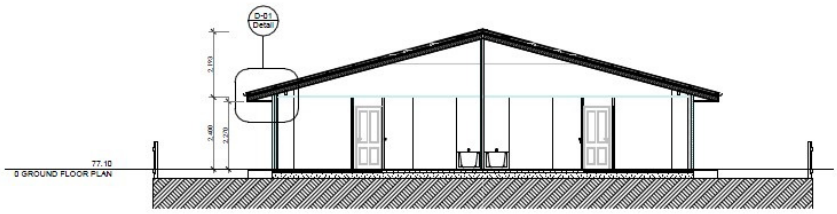
North Elevation

South Elevation

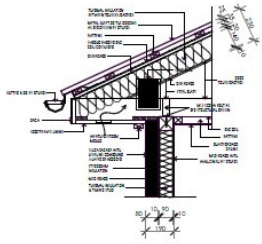
East Elevation



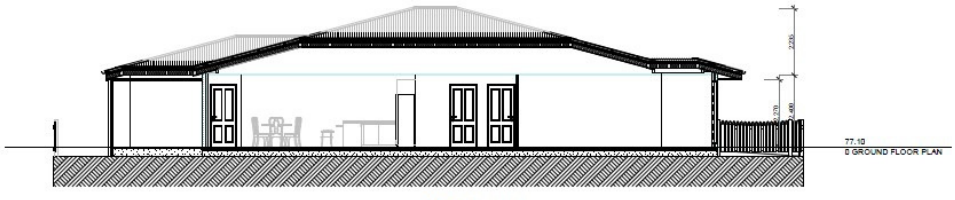
West Elevation



Section A



Detail

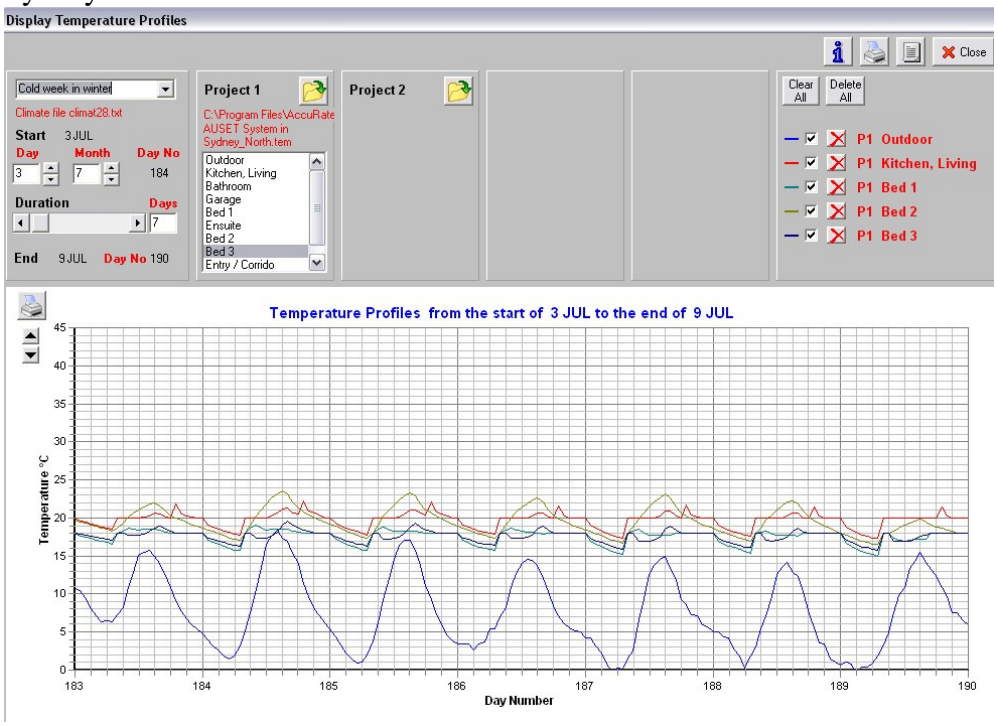


Section B

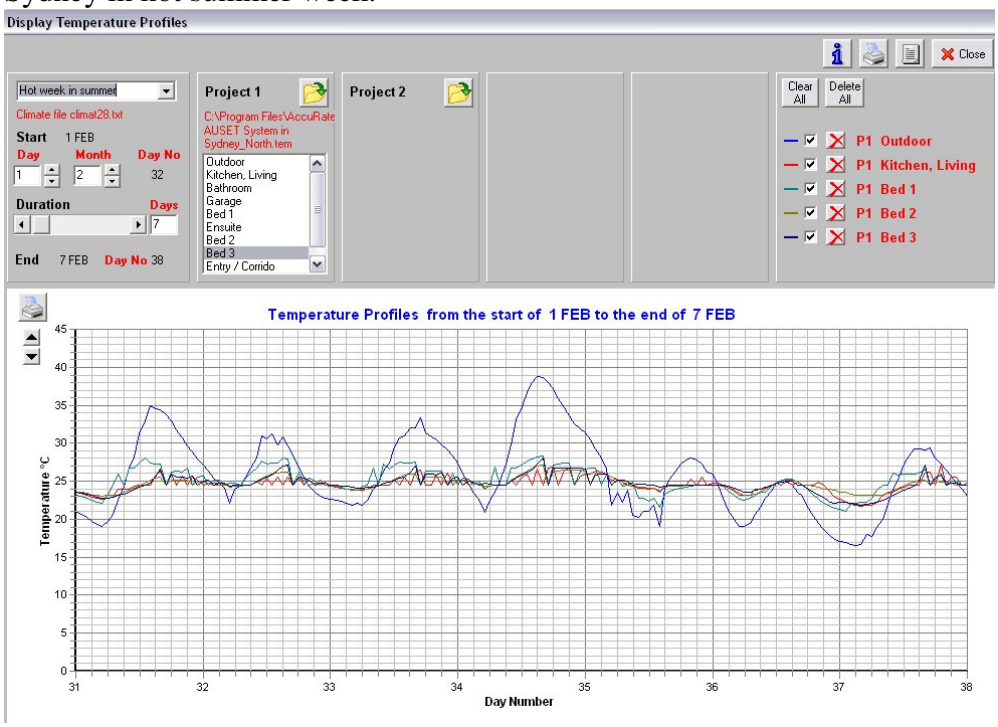
Australian Energy Efficiency Consulting
P.O. Box 1011, Double Bay, NSW 1360
W: www.aenec.com.au **P:** 0416 316 204 **E:** info@aenec.com.au

Performance charts

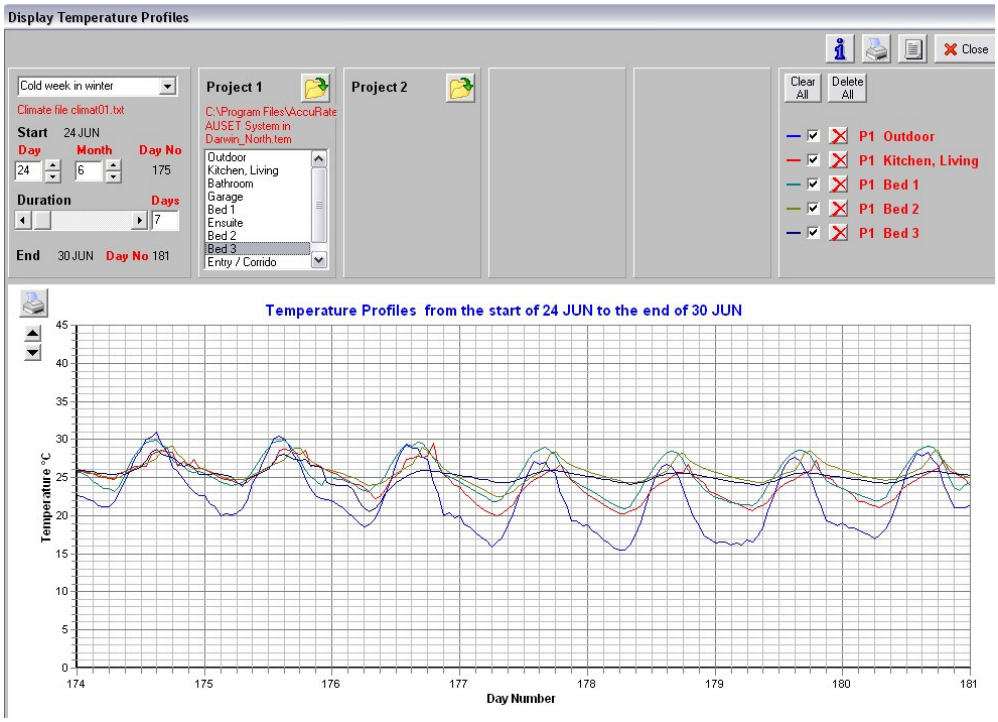
Sydney in cold winter week:



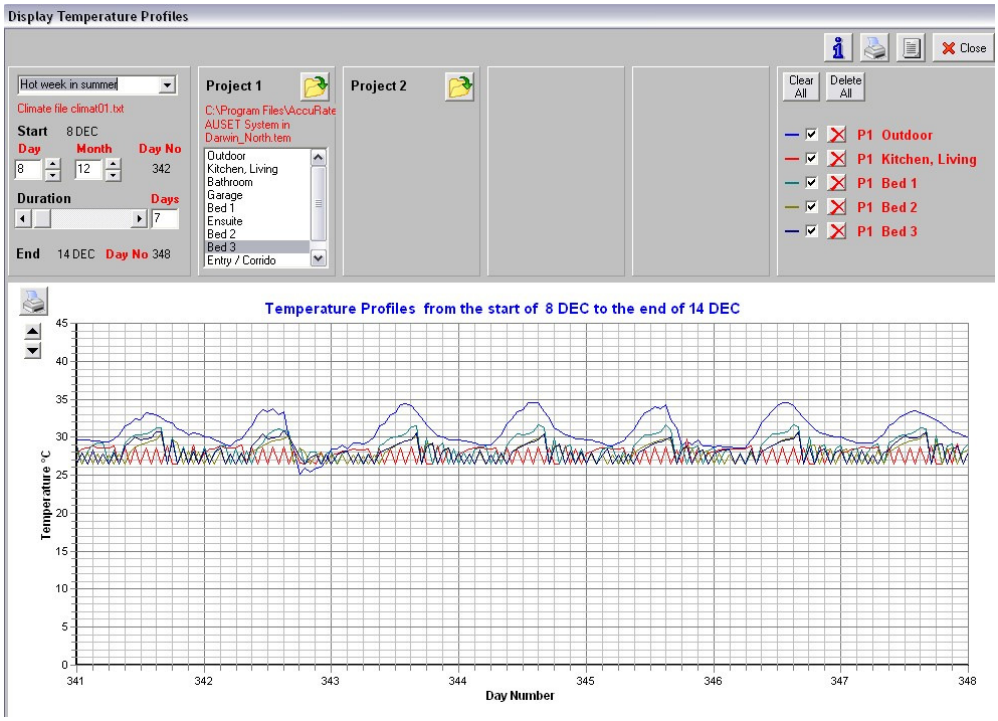
Sydney in hot summer week:



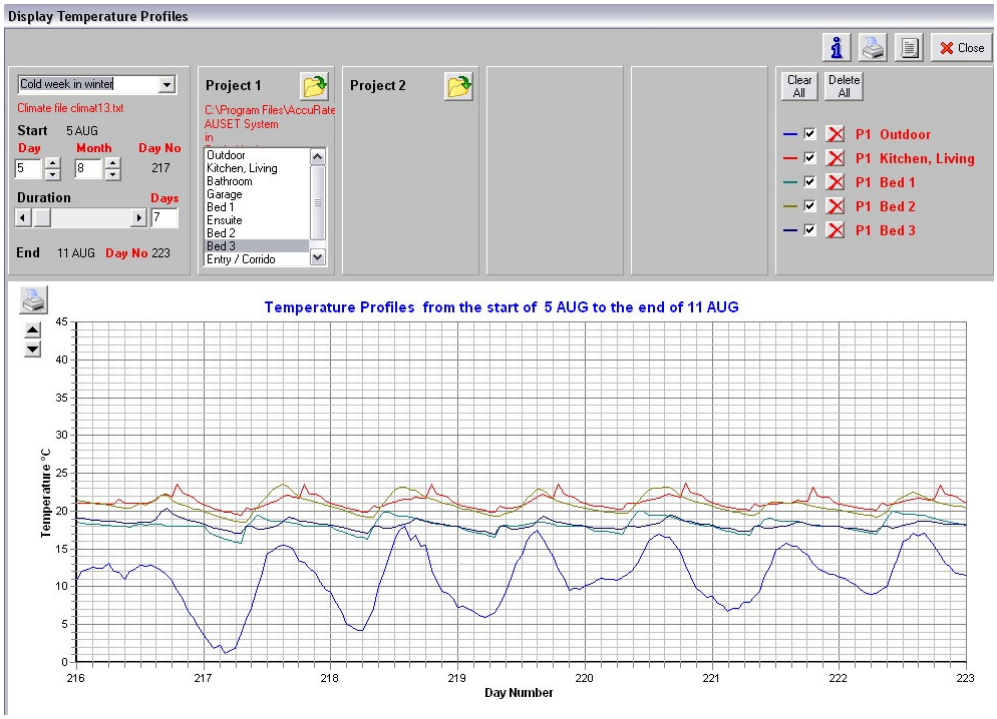
Darwin in cold winter week:



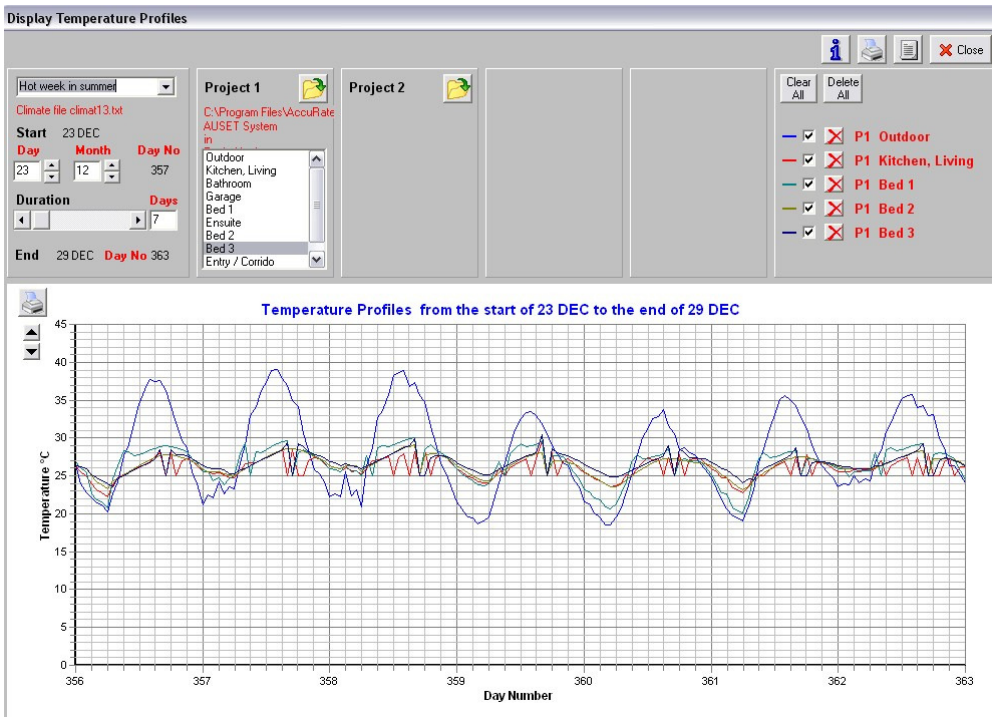
Darwin in hot summer week:



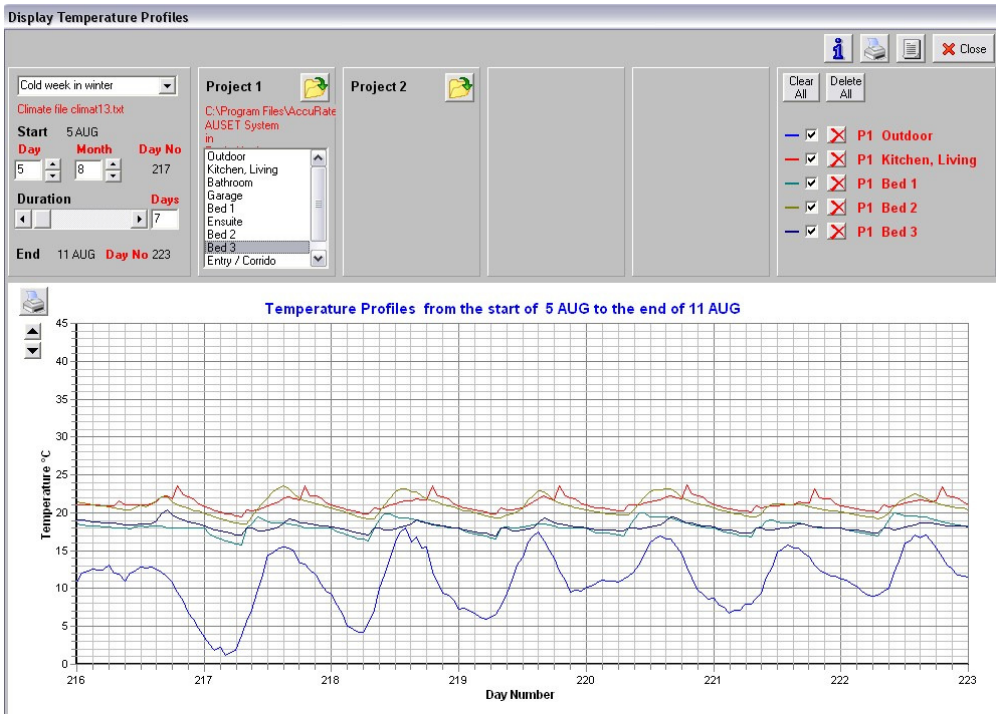
Hobart in cold winter week:



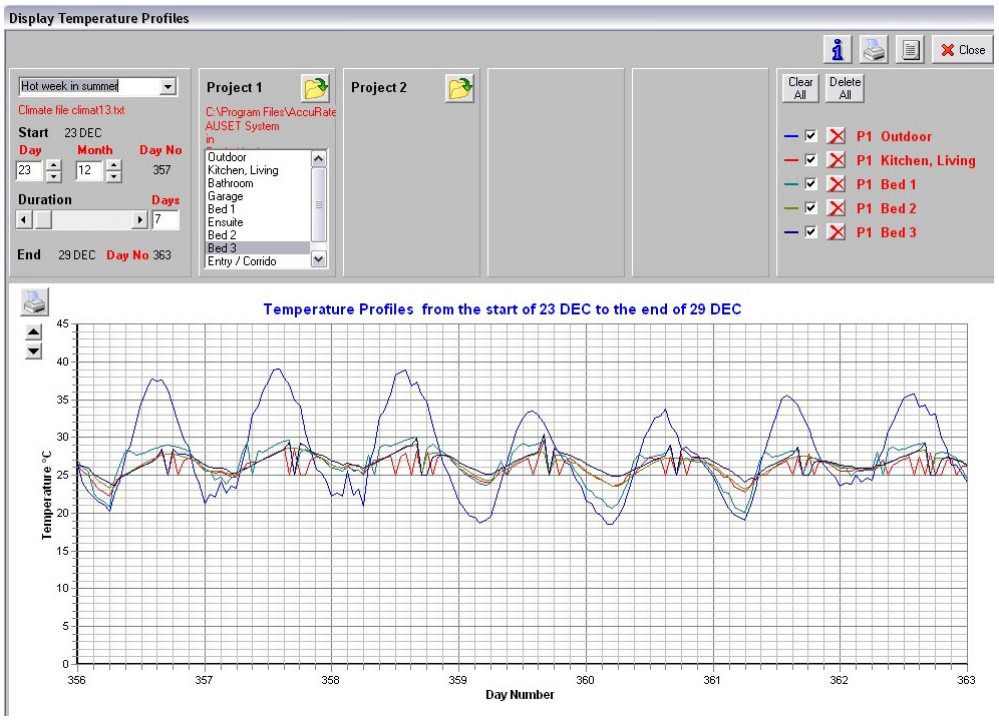
Hobart in hot summer week:



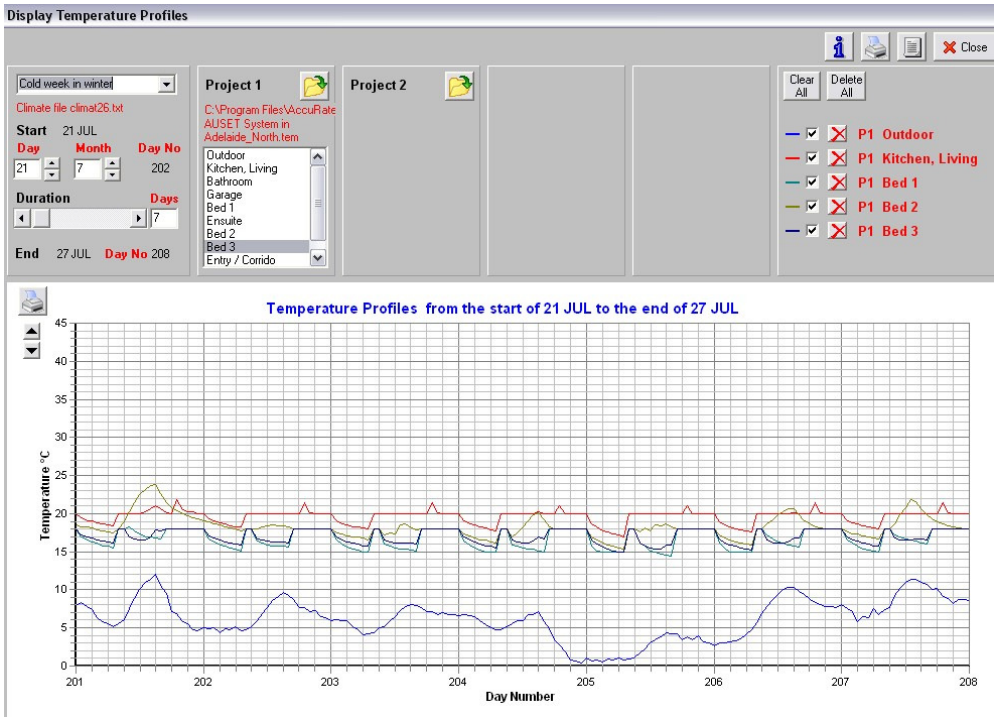
Perth in cold winter week:



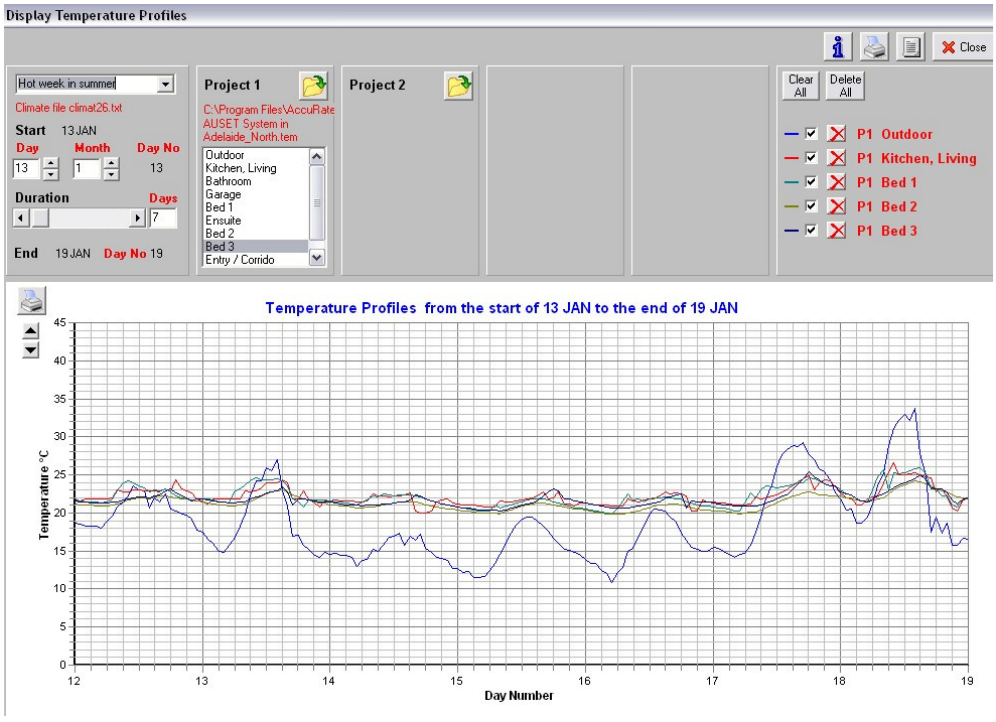
Perth in hot summer week:



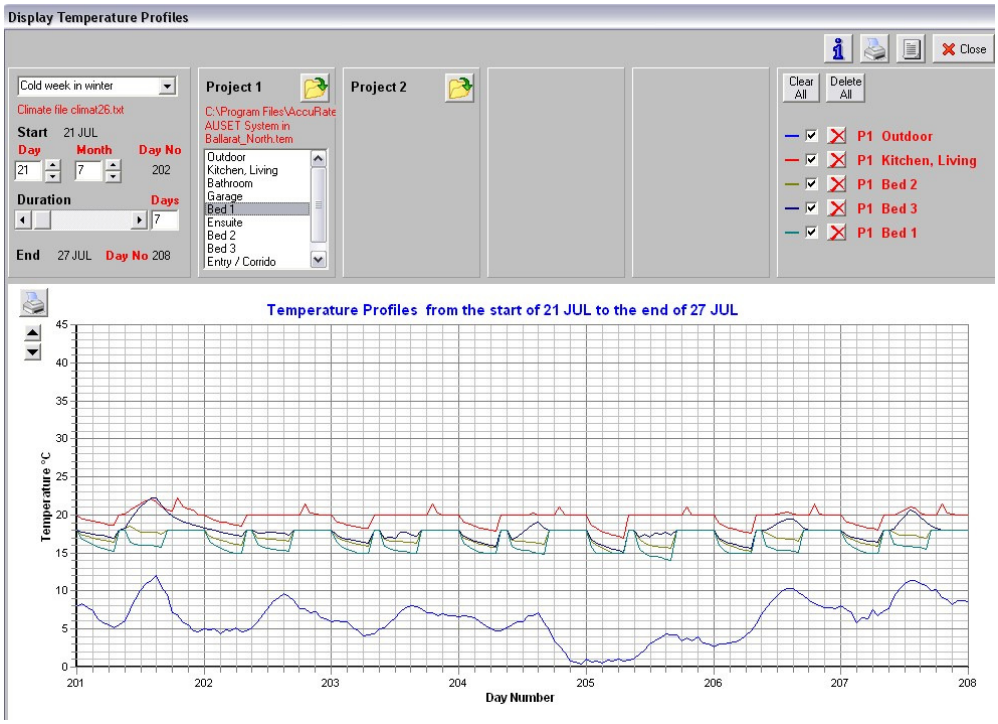
Adelaide in cold winter week:



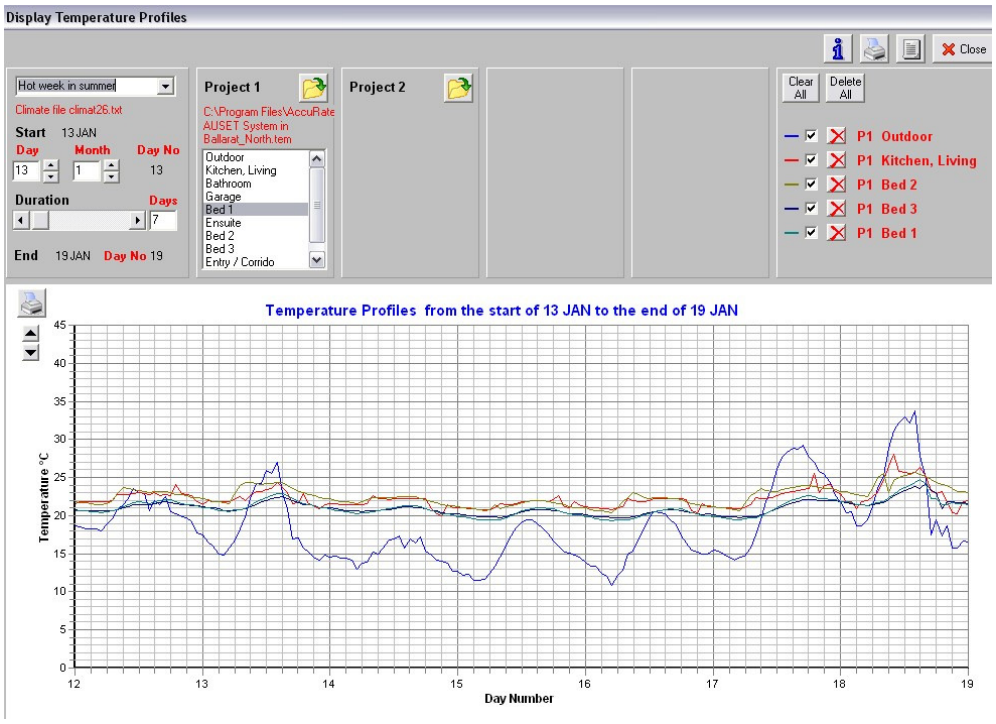
Adelaide in hot summer week:



Ballarat in cold winter week:



Ballarat in hot summer week:



Comparison of energy consumption between different constructions:

Fabric	Location	Range of energy consumption MJ/m^2 annum	Average energy consumption MJ/m2 annum from all orientations	Comparative energy consumption to Rapid Building System™
Brick Veneer R1.5 with R2.5 ceiling and Aluminum w/single Low E Glazing	Sydney 2166	85.4 - 63.9	74.65	Additional 65% energy required
	Darwin 800	298 - 277.1	287.55	Additional 6.4% energy required
	Hobart 7000	166.2 - 139.4	152.8	Additional 71% energy required
	Perth 6000	53.5 - 40.2	46.85	Additional 69% energy required
	Adelaide 5000	79.1 - 64.0	71.55	25% less energy required
	Ballarat 3350	192.6 - 175.7	184.15	Additional 66% energy required

Fabric	Location	Range of energy consumption MJ/m2 annum	Average energy consumption MJ/m2 annum from all orientations	Comparative energy consumption to Rapid Building System™
Cavity Brick R1.0 with R2.5 ceiling and Aluminum w/single Low E Glazing	Sydney 2166	86.5 - 62.9	74.7	Additional 66% energy required
	Darwin 800	296.5 - 278.2	287.35	Additional 6% energy required
	Hobart 7000	173.3 - 144.6	158.95	Additional 78% energy required
	Perth 6000	51.7 - 37.4	44.55	Additional 65% energy required
	Adelaide 5000	79.4 - 62.7	71.05	26% less energy required
	Ballarat 3350	198.9 - 180.2	189.55	Additional 71.5% energy required

Fabric	Location	Range of energy consumption MJ/m2 annum	Average energy consumption MJ/m2 annum from all orientations	Comparative energy consumption to Rapid Building System™
K.2 Standard house Rapid Building System™	Sydney 2166	52.6 - 37.5	45.05	0
	Darwin 800	282.4 - 258.0	270.2	0
	Hobart 7000	99.3 - 79.2	89.25	0
	Perth 6000	30.5 - 23.5	27	0
	Adelaide 5000	99.3 - 79.2	89.25	0
	Ballarat 3350	117.1 - 103.9	110.5	0

Summary:
It is evident that the Rapid Building System™ is superior that traditional building materials for most cases. As indicated from the table above houses using traditional building materials in certain climate zones require more than 65% more energy in order to achieve the same result.

End of report -