Design Guidelines			
as if 25.5.2008			
Design Strategy (from SHAC)	**Details Based on Scope of Project**	**Comments from Client**	**Reports**
ENERGY			
VISION: No net non-renewable energy consumption is required by the house & site			
Passive Solar Design	Oriented Correctly on Site, Maximize passive solar gain, Understand how the existing landscaping is going to affect design	Use land contours to protect from cold southerly; Use deciduous trees for shade in summer and allow sunlight in winter.	
Thermal Insulation	Straw bale in exterior walls, timber windows with double glazing (min.), weather-stripping on all exterior doors & windows, high r-value in roof and floor insulation; thermal break in foundations	Enough insulation on roof and floor ranging from 250mm to 400mm; Straw bale construction with thick, breathing walls; Double glazed windows	
High Performance Building Envelope			
Passive Solar Heating	thermal mass, window placement & appropriate ratio & use of LowE	Maximize use of natural light	
Active Solar Heating	solar thermal design, appropriate massing & water storage	Under floor water heating system.	
Heat Storage	thermal mass (masonry stove, floors, walls)	Use stone tiles on the floor that are dark and store the passive solar energy in winter. Thick stone/concrete floor to store the passive warmth; Insulated water tank (diagram 1); In Finnish the generic name is "Varaava Takka." It means "heat storing fireplace." a. A large fireplace with a baking oven. Total mass approx 3-4000kg. (see addendum 1) b. Copper pipes to heat water simultaneously	
Low Energy Lighting Design	no recessed lighting, use of compact fluoresecents &		

Low Energy Appliances & Equipment	water heating, solar thermal, wetback; all appliances shall have good ratings; methane digestor (?)	Minimize electricity use (no water heating, no TV, no dishwasher, no drier, no microwave); Electricity needed for Radio/stereo, Computer, Eco light bulbs, Washing machine, Fridge, Freezer; Phone/internet; Computers for water heater distributor, pumps and other monitors	
Reduction of heat & air movement through the building envelope	weatherstripping on all windows & doors, good detailing during construction, no recessed lighting, well installed insulation, down-draft ducting		
Electricity generation by renewable sources	solar (micro-hyrdro???)	would avoid wind for visual impact; Solar electricity - monocrystalline	
Renewable energy technology			
Electricity load shedding	grid-tie system?		
Energy Storage			
Embodied Energy in Materials Used	locally sourced materials as main structure (bales, stone, clay, lime, timber)		
Embodied Carbon Reduction			
Materials with Recycled Content	concrete with flyash?		
Durable & Locally Produced Materials	bales, stone, timber, clay, timber		
Providing occupants with better feedback on availability & quantity of resources used			
Life Cycle Energy & Carbon			Life Cycle Analysis
WATER			
VISION: Mains water requirements & water leaving the site as waste are minimized			
Water efficient fitting and appliances	efficient plumbing fixtures, efficient water storage	Use solar electric pump	
On-site water capture and reuse	rainwater collection	Join the community water scheme; Up-to-date gray water system, in which water can be incorporated to the drip irrigation system.	
Water Supply flow rates optimized to balance required performance and conservation	efficient taps (kitchen sink, bathroom sink, shower)		

Local retention of storm water runoff	swales that retain stormwater for gardens		
Storm water treatment train with consideration of rain gardens and swales	permaculture concepts		
Wastewater minimised and/or reused	greywater system, composting toilet	composting toilet (solar electric or manual system); rotating outdoor compost; Separating fluids/solid; to use compost after 2 yrs in orchard; Up-to-date gray water system, in which water can be incorporated to the drip irrigation system.	
Information on water use readily available	collect data on how much water is used/month (metre)		
In-house water supply flow rate optimized			
Plumbing system design for water and energy efficiency, site design, recognition of local soil and climate conditions and low water use garden design applied	incorporate the natural drainage of the site into design, low water use plantings (xeriscape principles)	composting toilet (solar electric or manual system); rotating outdoor compost; Separating fluids/solid; to use compost after 2 yrs in orchard; 30,000L water tank with 20,000L firefighting reserve (council requirement); Drip irrigation system, gravity fed; small vineyard (200 plants); olive grove; 10-15 fruit trees; native trees and plans rest of the area	
MATERIALS			
VISION: All the materials are re-used, recycled or made from renewable resources. Building materials are durable, typically they will last long as or longer than it will take to grow or produce those resources again. All materials are made entirely from materials grown or manufactured in New Zealand			

Materials that are renewable	straw bales, timber		
Readily available	straw bales, stone, clay, timber, lime		
Affordable & easy to build with	straw bales as building blocks		
Selection of durable materials and systems according to intended use	materials specified appropriately to use		
Comprehensive design to protect materials from damage & decay	appropriate eaves, appropriate foundation		
Design for Ease of maintenance, optimized house size form, function & structure, reduction of building material waste protocols & practices, design for ultimate disassembly with little waste	maintenance schedule provided in specification; moisture sensors to be installed in straw bale walls for monitoring specifying materials to limit waste (no off cuts); structural components are biodegradable or easily re-used		
WASTE			
VISION: Development does not adversely affect the environment or increase the environmental loadings & pressure of waste, wastewater or stormwater.			
Minimization/reduction of impact	Material Separation on-site (recycling/compost/rubbish); materials that can be recycled are (list out what these might be); greywater & rainwater systems		
Optimization of new infrastructure, services, transportation	As materials used are primarily natural materials, they can be re-used and/or recycled at end of life		
Use of existing infrastructure services & transportation	occupant use of recycling and rubbish collection services; on-site composting		
INDOOR ENVIRONMENTAL QUALITY			
VISION: The design of your home allows you to maintain a healthy indoor temperature all year round, with no additional energy for heating & cooling.			
Support occupant control of the thermal comfort	heat storage, zoning, operable windows		

Source, specify non-, or low, pollutant emitting materials, finishes or products	Clay & Lime Plasters, all sealers to be low toxic, minimize use to treated timbers; vapour permeable wall system; minimize particle board (if used, seal it well)		
Specify non-emitting alternatives			
Seal materials that contain pollutants	low, non-toxic or natural sealers used		
Vent pollutants outdoors	Kitchen, bathroom & toilet to have exhaust fans		
Allow occupant control of indoor air temperatures and humidity	heat storage		
Minimize indoor moisture sources	Kitchen, bathroom & toilet to have exhaust fans		
Ventilate	Kitchen, bathroom & toilet to have exhaust fans		
Hard surface flooring to prevent mould growth	no carpet ?		
AFFORDABLE & SUITABLE FOR PURPOSE			
VISION: The house will be affordable. The occupants will be delighted by the house, its size, cost & features.			
KISS	we will try		
Collaborative Design			
Lateral thinking			
Low cost	higher construction costs, but lower running costs		
Simple			
Robust			
Durable	quality materials that are long-lasting		
Quality over quantity	not a large house for a small family		
Kiwi ingenuity			
SUPPORTING A SUSTAINABLE COMMUNITY			
VISION: Supports well-being, good quality of life, and healthy local environment today & into the future. Development does not adversely affect the environment or increase pressures.			
Distinctive identity	house will inherently feel good to occupants and visitors due to the natural materials that are used		

Local character	Materials sourced locally		
Civic Identity			
Efficient use of land	built into site; minimim ground disturbance		
Pedestrian, cycle & vehicle friendly	Able to walk and/or bike to the centre of town in 15/5 minutes		
Avoiding segregation	Neighbors close to house site		
Support social ties	house site in close proximity to town centre		
Link with multiple transport systems			
Plan for reduction in fossil fuel availability	bike to work		
Emulate the natural hydrology as much as possible	Fitting the house into the site; maintaining natural contours & flows as much as possible		
COMMUNICATION CAMPAIGN			
VISION: People in your region know how your team house design contributes to sustainable living and understand what features can be reproduced in their current or next house. Designers, builders, and the local council are familiar with your team designs and how to apply them successfully.			
Public display, workshops & demonstrations, final report available for reprinting	workshops, classes and reporting publically available; incorporation of professionals in region		
Develop for and solicit feedback from other teams, students and practicing professionals during, and following the course of the challenge			