

 <b>EARTH-SHELTERED ATRIUM HOME</b>	
<b>Reference:</b>	<b>06</b>
<b>Name:</b>	<b>Earth-sheltered Atrium Home</b>
<b>Climates:</b>	<a href="#">Dry Climates</a> <a href="#">Humid Middle Latitude Climates</a> <a href="#">Continental Climates</a> <a href="#">Cold Climates</a>
<b>Occupants:</b>	
<b>Living area:</b>	<b>1658.35 ft2</b> <b>154.07 m2</b>



**Description:**

Some have it that in the future, our resources will run so scarce that water will become the most valuable produce on the planet. Earth, on the other hand, is still one of the most abundant materials on the planet. Thus, water collection, treatment and conservation, together with the fine insulating properties of earth, provide the principles on which this EcoHouse is founded.

Earth-sheltered buildings are best protected against extreme temperature variations, storms, earthquakes, noise and sadly, even military air strikes. With this in mind, as well as the passive design principles of internal heat zoning and compact planning was this EcoHouse designed.

Due to the oval shape of the inner atrium (the court), the living room, the kitchen and dining and the bedrooms all face maximum sunlight, sometimes from the south, at other times from the east and the west. Special emphasis has been put on the utility room to accommodate major installation equipment.

The house would be ideally located in valleys and plains, and the excavated earth could easily be used to top the building. The windows oriented towards the sun attract maximum solar radiation during the cold season, but are also provided with external reflecting surfaces rigid insulating boards that are operated manually, which means that you can regulate the amount of sun needed throughout the day/year yourself, or shut them completely in the night, to store the solar heat collected during the day, thus acting like shutters.

The entire roof area can be used for planting vegetables or making a roof garden, thereby providing an independent food source to the occupants. Apart from that, an insulated vertical wind shaft, ending in a skylight, provides natural cross-ventilation and lighting of the living room. At the foot of the skylight there is a food-chain pond, over which the airflow freshens up. The windcatch can be oriented to face the prevailing winds in your area. The pond is envisaged to provide an additional home-made food source for the household: it is used for breeding algae, shrimps, and catfish. The softwater algae feed on crayfish excrement. The shrimps eat the algae, and the occupants of the house, in turn, may eat both the shrimps and the catfish. Please bear in mind, that if you are a vegetarian, or would not readily support such a food chain under your own roof, you can always use the pond as an internal fountain, or an aquarium instead!

Another food source can also be given by the atrium pond which, in this case, has been designed as a Zen Garden, but can be of any other design to meet your requirements. The atrium pond helps refresh the air but additionally accumulates solar heat for the building. The focal point of the garden is the environmental sculpture made of Shape Memory Alloys (SMA's), which changes shape every time there is a 10°C temperature drop or rise in your environment. This means that Nature itself gives your sculpture the current look, so that it does not follow any artistic style or ideology, but whose form is determined by your environment and climate.

Considering that the ideal location for this EcoHouse would be in a plain, which are usually characterised by abundant windpower, Earth-sheltered Atrium has also **optionally** been provided with a stand-alone wind turbine, to produce electricity for the household. However, before you consider buying and using the wind turbine, make sure that you have adequate wind power in your surrounding area. Southwest Windpower - the manufacturer of the Whisper 500 wind turbine used in our design, provide international wind maps at <http://www.windenergy.com/International.htm> which enable you to assess the windpower in your country and your area.

The Whisper 500 can produce enough energy to power an entire home. Formerly the Whisper 175, the Whisper 500 was completely redesigned in 2004 to work in harsh high wind environments. The Whisper 500 is a two bladed fiberglass reinforced blade and incorporates the patented side furling design that optimises output at any wind speed. Assuming a 12 mph (5.4 m/s) wind, a Whisper 500 will produce as much as 500 kWh per month. That is enough energy to power the average EcoHome.

Masonry walls and foundations are made of recycled concrete blocks with recycled paper fillings. Recycled glass is used for floor insulation, as well. An insulating entry air lock has been provided, together with sliding doors with tempered, insulated glass. All windows are sliding, double-glazed, with the possibilities of the beadwall system inclusion. Water-saving toilet seats and other water-saving sanitary equipment has been used throughout the project.

**Areas:**

Living Space		ft2	m2	Living Space		ft2	m2
Living		287.3964	26.7	Corridor 1		118.9197	11.048
Kitchen & Dining		116.7238	10.844	Corridor 2		140.9319	13.093
Utility		133.0742	12.363	Foyer		30.86013	2.867
Garage		212.5442	19.746	<b>Total:</b>		<b>1658.353</b>	<b>154.066</b>
Entry		37.7598	3.508	<b>External Space</b>			
Bathroom 1		48.556	4.511	Atrium (entire)		500.5218	46.5
Bathroom 2		28.40596	2.639	Zen Garden		155.56	14.452
Laundry		28.3952	2.638				
Master Bedroom		237.7102	22.084				
Bedroom 1		138.736	12.889				
Bedroom 2		74.28175	6.901				

Internal Pond:			24.05734	2.235				Grand Total:		2158.874	200.566
FURNITURE AND EQUIPMENT											
ID	ITEM	DESCRIPTION	QTY.	ID	ITEM	DESCRIPTION	QTY.	ID	ITEM	DESCRIP	QTY
C1	CBS3636	kit. cmr base cab	1	FU39	60W13D	Curio Cabinet	1				
C2	BDR2436	kit. base cab	2	FU40	36W20D	Cabinet Wardrobe	1				
C3	BDR2436	kit. base cab	1	FU41	26W18D	Ottoman	1				
C4	UDR2484	util cab	2	LS1	4' Small Statuary	Lavstfn	1				
C5	UDR2484	util cab	1	LS2	3'7 Large Flower	Spathin	1				
C6	CUD3684	cmr util cab	2	LS3	5' Large Flower	Dracan	1				
C7	CUD3684	cmr util cab	1	LS4	3'7 Large Flower	Dracan	1				
FX1	32W19D	Oval Free Standing	1								
FX2	33W33D	Corner Kit. Sink	1								
FX3	30W30D	Handicap Toilet	1								
FX4	64W64D	Corner 64x64" Spa	1								
FX5	30W30D	Handicap Toilet	1								
FX6	32W32D	Small 32x32" Shower	1								
FX7	32W19D	Oval Free Standing	1								
A1	31W26D	30" Elec. Range	1								
A2	30W30D	30"L Refrigerator	1								
A3	27W28D	Washer	1								
FU1	85W35D	7' Sofa	1								
FU2	58W80D	Double Bed Contemp.	1								
FU3	20W20D	20x20 End Table	1								
FU4	44W80D	30x66 Seat 4-6	1								
FU5	20W20D	20x20 End Table	1								
FU6	48W24D	48x24 Contemporary	1								
FU8	26W26D	Swivel Chair	1								
FU9	80W84D	King Bed Contemp.	1								
FU10	20W18D	2 Drawer	1								
FU11	20W18D	2 Drawer	1								
FU12	60W21D	Ent. Center Offset	1								
FU13	20W20D	Cactus	1								
FU14	24W12D	Clothes Hamper	1								
FU15	48W18D	48" Dressing Table	1								
FU16	18W18D	Dressing Table Chair	1								
FU17	48W24D	48x24 Contemporary	1								
FU18	24W20D	Roller Stand	1								
FU19	48W17D	Ent. Center 15" TV	1								
FU20	48W12D	4' Bookcase	1								
FU21	29W17D	Ent. Center 18" TV	1								
FU22	38W44D	Fern	1								
FU23	36W14D	14x36 China Cab.	1								
FU24	38W44D	Fern	1								
FU25	42W80D	Contemp. Twin Bed	1								
FU26	48W24D	48x24 Contemporary	1								
FU27	26W26D	Swivel Chair	1								
FU28	48W20D	20x48 Contemporary	1								
FU29	31W35D	Contemporary Chair	1								
FU30	44W30D	30x42 Projector TV	1								
FU31	23W20D	Components Cabinet	1								
FU32	14W8D	Stereo Speaker	1								
FU33	14W8D	Stereo Speaker	1								
FU34	7W3D	Wall Phone	1								
FU35	66W55D	Riding Lawnmower	1								
FU36	17W17D	17" Diffuser Lamp	1								
FU37	31W35D	Contemporary Chair	1								
FU38	38W44D	Fern	1								
Working Drawings Contents:											
Type of Drawing:						Number of Sheets per Drawing:					
Site Plan											1
Foundation Plan											1
Floor Plans											1
Section											1
Joinery details											3
Rainwater treatment details											1
Structural calculation											2
Specifications of Eco-building materials and products											Complete set
Materials List											Complete set
Roofing details											1
Wall details											1
Internal finishes details											1
Stand Alone Wind-energy Electrical Supply Schematics											1
Landscaping details											1
Price (USD):										\$	384.00
Complete set of printed plans + CAD files on business-card CD (USD):										\$	411.75

