

 SUNFLOWER HOME	
Reference:	07
Name:	Sunflower Home
Climates:	All
Occupants:	
Living area:	2478.71 ft2 230.28 m2



Description:

Sunflower leaves are phototropic, will follow the sun's rays with a lag of 120 behind the sun's azimuth, and it is exactly this property that served as example of how we were to tackle the problem of a universal EcoHouse to covering all world's climates. On the other hand, from igloos to African huts and Mongolian yurts, the dome is a form of architecture that humanity has used over and over again, a pattern found in nature itself, featured in various life forms, the planetary globe, and other planets of the universe. The Sunflower Home creates an interior of warmth, conviviality and light while responding to the desire of many people concerned with using materials and technology compatible with our fragile environment.

The highly Eco-Tech Sunflower Home is an EcoHome that turns around its horizontal axis to follow the movement of the sun! Bearing on a powerful electric motor placed in the static basement, the dome of the house can be revolved along its horizontal base to make best use of sunlight, but also moonlight, windpower and external views. This means that you would be able to literally expose your, say, living room to maximum sunlight in the winter, as well as protect it from excessive sunlight in the summer. You could expose your bedroom to maximum moonlight in the night, thus creating a romantic atmosphere, avoid or expose rooms to winds throughout the day, week, month, season or year, as you see fit, or set the entire dome to follow the sun all throughout the day by moving at 40cm/h - the exact speed at which the Earth moves around the Sun throughout the day.

The ground floor is divided into two zones:

1. The inner, static zone, featuring the central core with the vertical installations duct and utilitarian spaces that require installations, such as the kitchen, the restroom, laundry, storage, the greenhouse and the fireplace, as well as a circular corridor, enveloped by walls with installations to supply parameter rooms
2. The external dome with rooms, windows, and the entry door, that can be spinned using the electric motor to accommodate the household as described above.

The dome, the floor and the partition walls between rooms are entirely made of the world's most perspective building material by the name of Aerogel - recently made available by various manufacturers at quite moderate commercial prices. A highly insulative solid material, aerogel has the lowest density of any known solid. One form of this extraordinary substance is 99.9 percent air and 0.1 percent silica dioxide (by volume). One thousand times less dense than glass, aerogel has earned the nicknames "blue smoke" and "solid smoke." It is an important material for our future. A block of aerogel as large as a human may weigh less than half a kilogram (or less than a pound), yet support the weight of a subcompact car (about 454 kilograms, or 1,000 pounds), which means that it is an excellent loadbearing material as well. Thanks to its fantastic insulating properties, aerogel is used by NASA in space, and in that sense, it is an ideal insulating material for any world climate, too. In space, aerogel looks completely transparent, whereas on Earth, aerogel has the light blue colour for very much the same reasons as our sky appears blue. However, aerogel can be painted, too. Best used is thermochromic carbon-based pigment that fades as the temperature rises and brightens as it cools, if affordable. The material can be used as an exterior house paint that would darken and absorb heat from sunlight during colder seasons. For better part you would not need to paint aerogel at all, as it provides enough visual indoor privacy when viewed from afar, but if you so wish, light colours can be applied in climates requiring reflection of sun's rays (e.g. Hot Dry Climates), whereas darker ones in cold climates that need considerable absorption of solar energy. It can be sprayed with a silicone agent and dispersed in petroleum distillates. When fluid paint is applied, however, the surface of aerogel is slightly damaged (shrinkage, marring, loss of transparency) be damaged but the paint adheres and colours the material. Alternately, the dome can also be a geodesic dome with aerogel panel fillings, or constructed of curved aluminium frames, and filled likewise.

In order to reduce bills and supply the demand of the electric motor that spins the building, Sunflower Home is also envisaged with a home power production machine.

The Lutec 1000 generator will produce up to 1000 watts of DC electricity twenty four hours a day, every day, which will be stored in a battery bank and then inverted to AC power and connected directly into the EcoHome. It is the first free energy machine to be developed to commercial stage anywhere in the world, and will become generally available for purchase by the end of 2005.

Ventilation, Indoor Air Quality and heat recovery from within the EcoHouse has been achieved using the brilliant Lifebreath Clean Air Furnace®, manufactured by Nutech Brands. The Utility room in the basement serves to accommodate bulky equipment belonging to both systems above.

Surface water collection and biological treatment has been provided for the building. Water-saving toilet seats and other water-saving sanitary equipment has been used in the project. Recycled glass floor and wall tiles were employed for sanitary and utilitarian spaces, while the fine insulating properties and simplicity of cork flooring was used in rooms.

Sunflower Home provides a healthy and convivial space yielding lower humidity, electromagnetism and radioactivity than found in traditional houses. It resists earthquakes as it does not offer any perpendicularity to the seismic ray. Thanks to its aerodynamic shape, it can resist the wind up to 250 km/h, making it Hurricane-proof.

It is possible, as an option, to equip the Sunflower Home with solar panels in order to accumulate solar energy. This option, together with the programmed automatic rotation allows it the acquisition of the necessary, uninterrupted energy during the day, when following the course of sun.

Areas:

Ground Floor Plan		ft2	m2	Basement Plan		ft2	m2
Living and Dining		258.7214	24.036	Electric Motor Operative Area		1217.377	113.098
Master Bedroom		205.849	19.124	Garage		266.7728	24.784
Bedroom		195.2035	18.135	Utility		37.38306	3.473
Small Bedroom		99.93214	9.284				
Kitchen		54.54073	5.067				
Restroom		38.11501	3.541				
Greenhouse		30.182	2.804				
Storage		19.66566	1.827				
Laundry		19.19205	1.783				
Entry		35.77924	3.324				
Total:		957.1807	88.925	Total:		1521.533	141.355

FURNITURE AND EQUIPMENT							
GROUND FLOOR PLAN							
ID	SIZE	DESCRIPTION	QTY.	ID	SIZE	DESCRIPTION	QTY.
Obj.-023	0.90 m	Bed	2	Obj.-037	1.20 m	Table round 120	1
Obj.-024	0.50 m	Bedside table	2	Obj.-038	0.47 m	Cab Base 1D	2
Obj.-025	1.20 m	Book shelf 2	1	Obj.-039	0.60 m	Cooker	1
Obj.-026	0.43 m	Chair Mackintosh	4	Obj.-040	0.60 m	Dishwasher	1
Obj.-027	0.46 m	Computer	2	Obj.-041	0.60 m	Fridge	1
Obj.-028	1.20 m	Cupboard	2	Obj.-042	0.80 m	Sink 1	1
Obj.-029	1.30 m	Desk	2	Obj.-043	0.30 m	Wall cab element co...	1
Obj.-030	1.80 m	Double bed	1	Obj.-044	0.60 m	Wall cabinet element	2
Obj.-031	0.48 m	Keyboard	2	Obj.-045	1.50 m	Showertub	1
Obj.-032	0.48 m	Monitor 19-inch	2	Obj.-046	0.60 m	Washingmachine	1
Obj.-033	0.51 m	Office Chair 2	2	Obj.-047	0.37 m	Water-saving WC	1
Obj.-034	0.41 m	Plant	7	Obj.-048	0.60 m	Table coffee	2
Obj.-035	0.60 m	Plant pots	7	Obj.-049	1.07 m	Table Mistic	1
Obj.-036	0.90 m	Sofa Corbusier	3				

Working Drawings Contents:	
Type of Drawing:	Sheets per Drawing:
Site Plan	1
Foundation Plan	1
Floor Plans	2
Section	1
Exterior Elevations	1
Vertical Circulation Details	1
Joinery Details	4
Rainwater treatment Details	1
Structural calculations	7
Specifications of Eco-building materials and products	Complete set
Materials List:	Complete set
Specifications of HVAC and IAQ (Indoor Air Quality)	Complete set
Roofing Details	1
Wall details	1
Schematic Electrical layouts	2
Plumbing Plans	2
Landscaping details	1
Price (USD):	\$ 601.92
Complete set of printed plans + CAD files on business-card CD (USD):	\$ 630.82



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