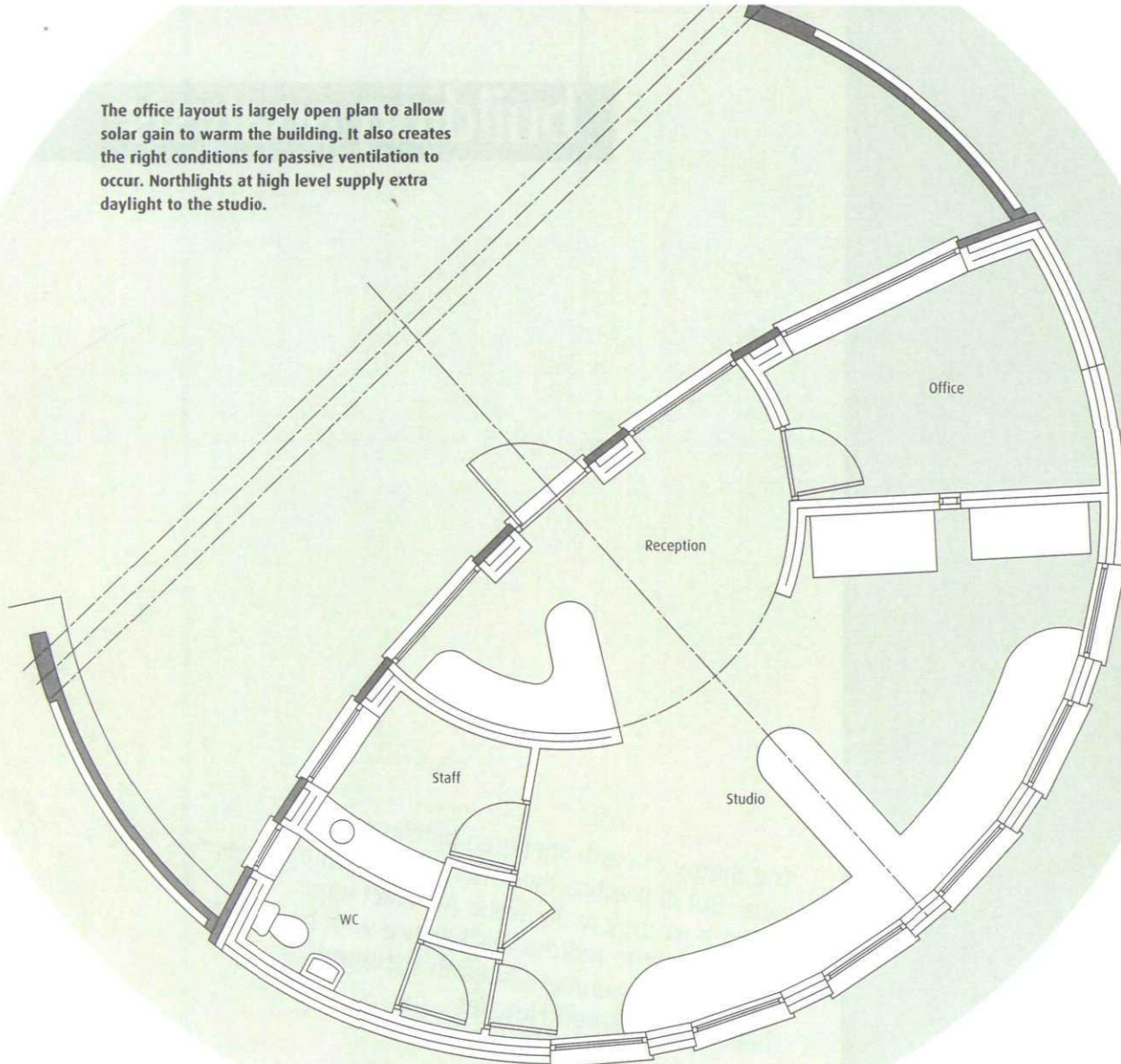


The office layout is largely open plan to allow solar gain to warm the building. It also creates the right conditions for passive ventilation to occur. Northlights at high level supply extra daylight to the studio.



south-east. The south elevation is a curving convex shape, with full height glazing, including the main entrance door which is also fully glazed. The office plan is semi-circular in design and includes a reception area, a design studio with three cad workstations for architects, an office and staff kitchen and toilet areas. From front to back, the office is open plan to maximise natural daylighting. Harrall has included high level windows on the north side of this building in order to provide consistent daylighting for the studio area. These north lights, as well as the other windows, also provide in excess of 8000 mm² background trickle ventilation.

The 180 m² dwelling faces south west. It is effectively a straight block, bent at about 120° around a circular living room which divides four bedrooms from the kitchen, utility and larder areas. Like the office, the southerly elevations are highly glazed to encourage passive solar gains into the house. This part of the house faces away from the road, providing privacy and an acoustical buffer for the occupants. The main entrance to the dwelling is from the north side. This has been specially designed to aid the process of passive ventilation (see below for further details).

By using the industry standard of 24 mm

low-E double glazed units, the pragmatic adaptation of earth sheltering for affordable housing remains a reality. With this brief Jeld-Wen developed their Hi-Profile combi window range specifically for this project which is now included in their 2002 catalogue.

Environmental cement

Harrall is aware of the environmental problems associated with the manufacture of cement and the Ready Mix Bureau encouragement of cement part-replacement concretes. One such low embodied energy concrete developed by Professor Stanley Wild and Dr Martin O'Farrell of the University of Glamorgan was utilised commercially for the first time in which 10% of the cement is replaced with ground brick dust supplied by Hanson and mixed by Tarmac. Quartzite aggregate provides the dominant floor finish following grinding and polishing of the concrete.

The design of the floor and walls play an important part in the way the buildings work. The buildings are designed so that no excavation is necessary, making them more environmentally friendly. The foundation is a 200 mm reinforced concrete slab. This sits on 150 mm of rolled brick batts, beneath 200 mm of carrstone

hardcore. The brick batts are recycled brick waste from Hanson's Whittlesey depot. For extra insulation, there is 140 mm of extruded polystyrene between the hardcore and the slab.

Walls are 300mm thick with two leafs of 100 mm Hemelite concrete blocks and a 100 mm cavity with reinforced concrete. Average U-value for the walls is 0.01 W/m²K, and for the floor 0.1 W/m²K. Averages are used, as the earth covering is at different depths around the buildings sides.

Keeping warm and dry

A tanking membrane is applied to the outer surface of the roof, walls and floors. Extruded polystyrene boards on top of the tanking add extra insulation. The extruded polystyrene is used on the roof and walls and is 140 mm deep. After this the earth (which is 100% recycled compost) is placed on top to a minimum depth of 750 mm which is dressed with a woven nylon membrane and evergreen herbaceous shrubs are planted through the membrane.

One of Harrall's main aims for both buildings is that they require no active heating system for heating and create no net contribution of CO₂. "There is a low grade electric underfloor heating