# ECO-SLAB™

Super Low Carbon Eco-Slab

## Insulated Ground Floor Solutions

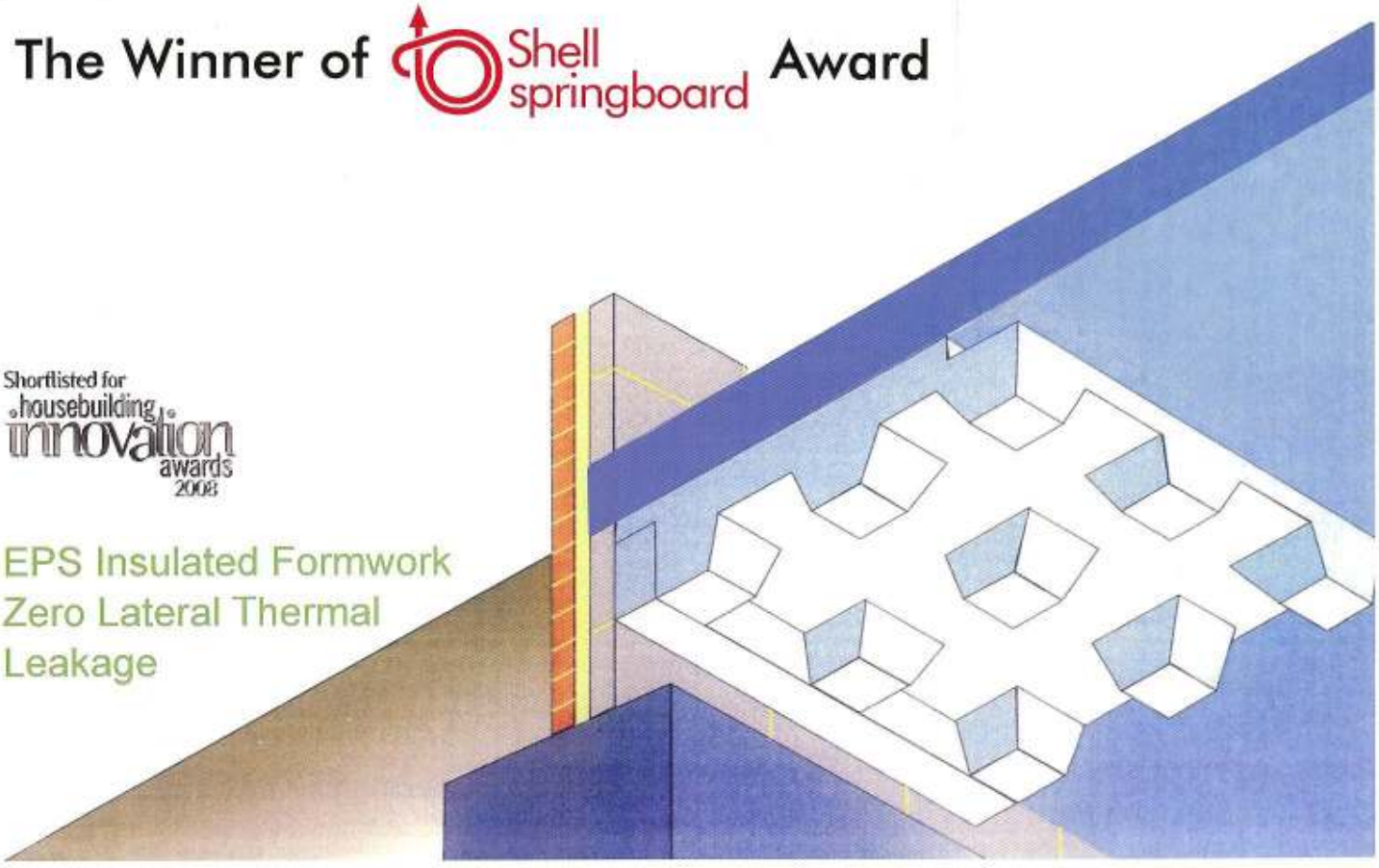
A Guide for house builders: using in-situ concrete with a unique system which combines permanent formwork and insulation to Part L.

# ECO-SLAB™

The Winner of Shell springboard Award

Shortlisted for housebuilding innovation awards 2008

EPS Insulated Formwork
Zero Lateral Thermal Leakage



Shortlisted for housebuilding innovation awards 2008

UK GREEN BUILDING COUNCIL Member

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Complies with **NHBC** requirements

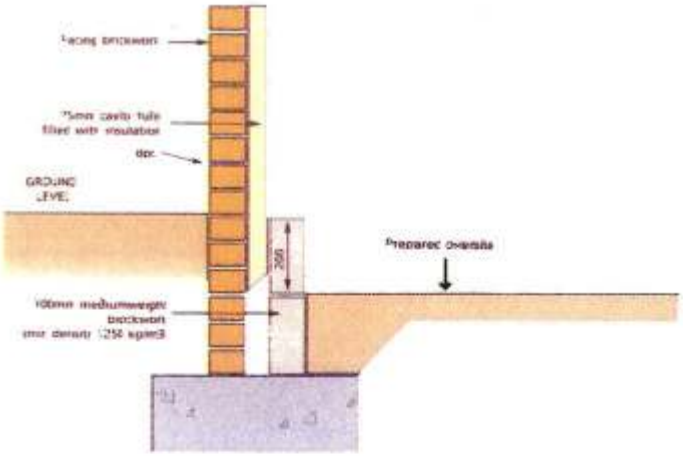



Figure 1

**The concrete to the foundations is poured and the foundation walls constructed. The services can now be installed and the oversize completed to the underside of the concrete slab, less 200mm to allow for the thickness of the ECO-SLAB™ units.**

**The ECO-SLAB™ wall edge module can now be fixed against the inside skin of brick/blockwork, forming a continuous run of insulation around the inside perimeter of the slab. Starting from each corner, ECO-SLAB™ 's unique ledge and lap main floor module can now be placed, with edge module forming the ledge. When laying is complete these modules will form a cruciform gutter that will be filled with the ECO-SLAB™ "cut to fit". Filler Module.**

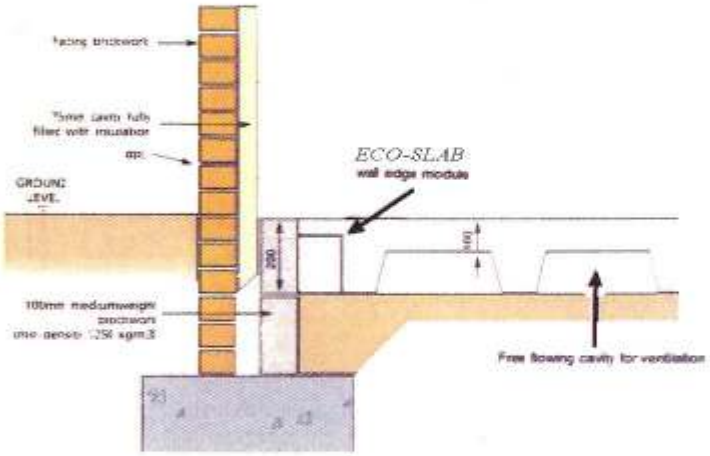



Figure 2

**The ECO-SLAB™ installation sequence is shown on the opposite page. Once installed the system will protect the services and any damp proof membrane previously installed.**

**The reinforcement can now be fixed in placed. All supporting chairs & spacers must comply with BS7973-1.**
**Any underfloor heating system can be fixed to the bottom mesh or to the manufactures specification.**
**An acceptable finish can be achieved using a Power float or wide, long handled "Easy Float"**

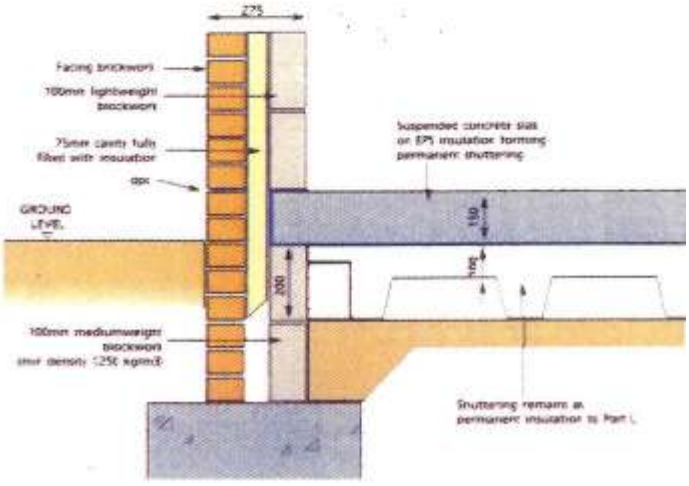



**Figure 3**

## ECO-SLAB™ construction sequence using edge insulation

The basic construction procedure has been used successfully for many years.

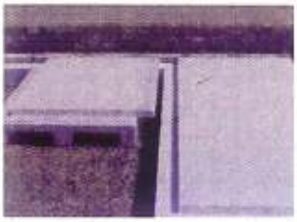
**1**

The foundation walls are complete. The oversite can now be brought up to 200mm below the underside of the slab. When the services are installed a sand blinding can be used to protect the damp proof or other membranes from any sharp projections in the oversite. This also achieves the final oversite level.

**2**

Corners are formed by cutting a beam module in half and butting-up to form each corner. The rest of the edge beam is locked together, with the male/female joints, giving a complete run of insulation. This will also form a "Ledge" for the main floor "Lap" to sit on.

**3**



The ECO-SLAB™ main "Ledge & Lap" floor units can now be placed, working from each corner to the centre of the slab. Any services that penetrate the slab should be let neatly in at this stage.

**4**

The main "Ledge & Lap" floor units will fit neatly together to form a seamless surface and leave a free-flowing cavity underneath, to allow ventilation. Gaps are filled with sections cut from whole units.

**5**

The main "Ledge & Lap" floor units will form a cruciform gutter where they meet at the centre of the slab. The cruciform gutter can now be filled by using the ECO-SLAB™ "Cut-to-fit" Filler module.

**6**

**The concrete can be now placed & finished in the traditional manner, using readily available site skills.**

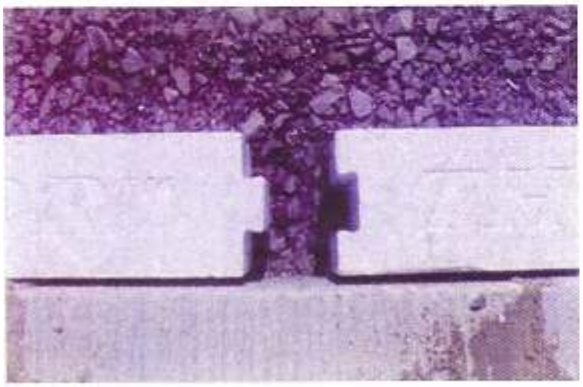
With no special tools or skills, using the ECO-SLAB™ system this ground floor suspended slab was completed to a high standard in only one day.

# ECO-SLAB™

## 0.23 U-Value Insitu Concrete Floors

### ECO-SLAB™ Slab edge Beam Module

The Beam Module has male/female joints at the butting ends. The Beam is fixed to the inside skin of Block/Brick work of the foundation walls, forming a continuous run of insulation.

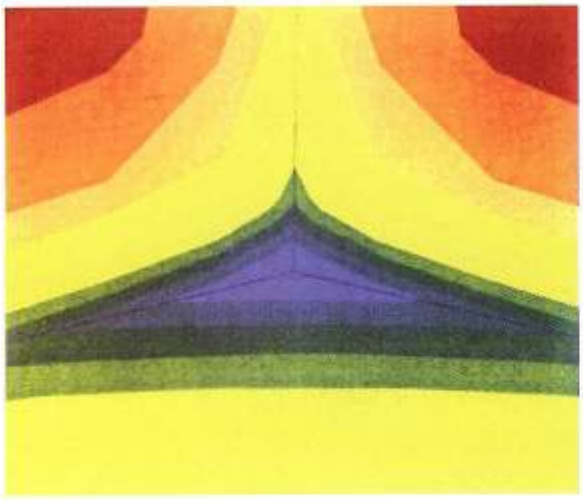


NOTES

Moulded material to be EPS capable of achieving 0.04 W/m-K minimum.
Maximum loading:
TF 20: 5.0 kN/m2 (500 Kg/M2)
TF 25: 7.5 kN/m2 (750 Kg/M2)
TF 30: 10.0 kN/m2 (1000 Kg/M2)
TF 35: 12.5 kN/m2 (1250 Kg/M2)
To be used in conjunction with a 120 x 150 section EPS edge block giving the same performance.
Overlap edges to have 50 x 240 section infil giving the same performance.

The Thermal Diagram and Analysis below is taken from the BRE report: Thermal performance of ground floor design RCB326A. Project report number 16098 which is available from your distributor, upon request.

## Linear thermal transmittance (W/m.K) 0.00



A temperature profile for floor design RCB326A

**Results of the numerical modelling**

Table A.4 summarises the results of the numerical modelling:

The lateral dimension, b, corresponds to half of an EPS leg plus half of an airspace between EPS legs. The airspaces between the EPS are retained in the second calculation.

| Table A.4 | Unit | Calculation (for construction as given) | Calculation (with adiabatic wall and foundations replaced by soil) |
|---|---|---|---|
| Total heat loss, Q | W | 5.20 | 3.48 |
| Lateral dimension of model, b (m) | m | 0.235 | 0.235 |
| Wall height above floor level (m) | m | 1.000 | 1.000 |
| Internal environmental temperature, $T_i$ | °C | 20 | 20 |
| External environmental temperature, $T_e$ | °C | 0 | 0 |
| U-value of wall | W/m²K | 0.388 | 0.000 |
| $L_1^{2D}$, $L_2^{2D}$ = Q/b ($T_i$-$T_e$). heat transfer coefficient | W/m·K | 1.106 | 0.740 |
| $h_w$ (m) | m | 1.000 | 1.000 |

the linear thermal transmittance, therefore, is given by:

$\Psi = L_1^{2D} - h_w U_w - L_2^{2D} = 1.106 - (1.0 \times 0.3880) - 0.740 = 0.0$ W/m·K

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