Howe Park PassivHaus



Alan Budden RIBA

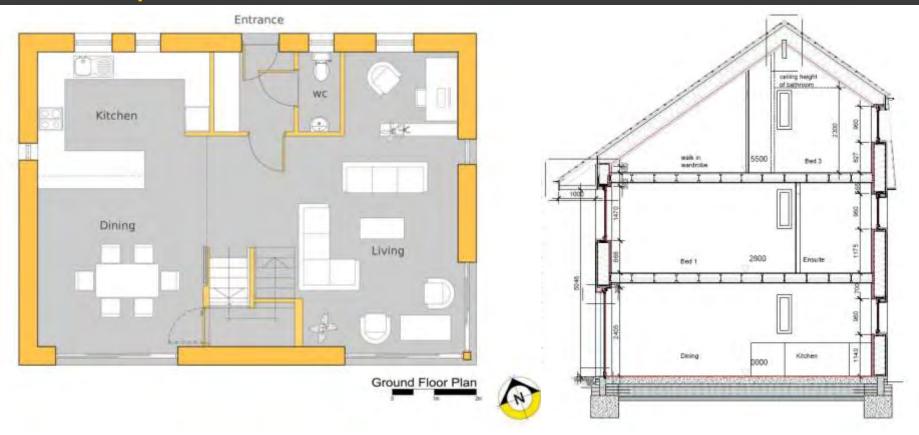
Director

www.ecodesignconsultants.co.uk





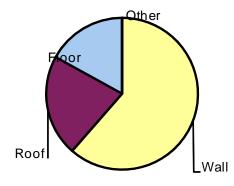
Compact Form



Form Factor 2.77

182 m² of usable floor area 453 m² of surface area

| Heat loss form factor | |
|-----------------------|------|
| Wall | 1.7 |
| Roof | 0.6 |
| Floor | 0.5 |
| Other | 0.0 |
| Total | 2.77 |



Good Orientation



Ecological Improvements to surrounding area

 Pond (MPWN7) opened up and supplied with clean roof water from the new development. New outfall from pond into drainage ditch in wood

 Area of rough grass maintained as long seminatural grassland and enhanced with wildflower seed mix or spreading of green hay from rearray meadow (following flora locale principles) and yellow rattle.

3. The orchard is to be retained and restored. Restoration works should include management of existing bress with the aim of intaining aeroid dead wood where possible with chadlon and management of species rich grassland ground flore.

 A new Roadside Hedge to be planted of nather species such as hazle, hawthorn, blackthorn, laurel and dogrose along Hengistoury Lane (approximately 60m) to provide privacy to the new development.

5. Creation of (4) amphibian friendly kerbing on the north side of the road. It is not feasible to move the existing gully pots, along Hengistbury lane with sumpless gullies instead they will be made amphibian friendly. This will be achieved by stepping the existing kerbing back 100mm. around the gullies and lowering the new kerbs. providing a safe exist of the road surface for amphibians.

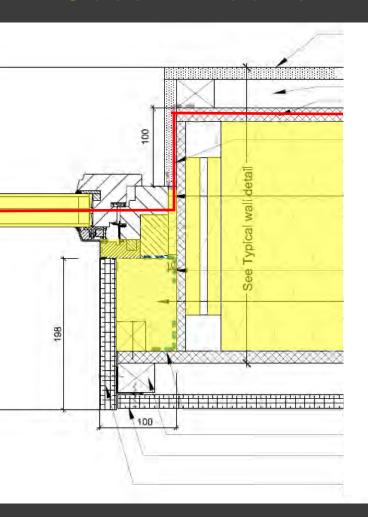
6. As compensation / enhancement a bat box scheme will be created at Howe Park Wood. This will use standard methodology of 1 but box per hectars totalling 24 boxes.

 All external Lighting used on the house will be directed away from the woodland / orehard edge, and timed to avoid areas that may be used by bats.

Avoid over shading - particularly low winter sun



Good Windows





High Levels of Insulation

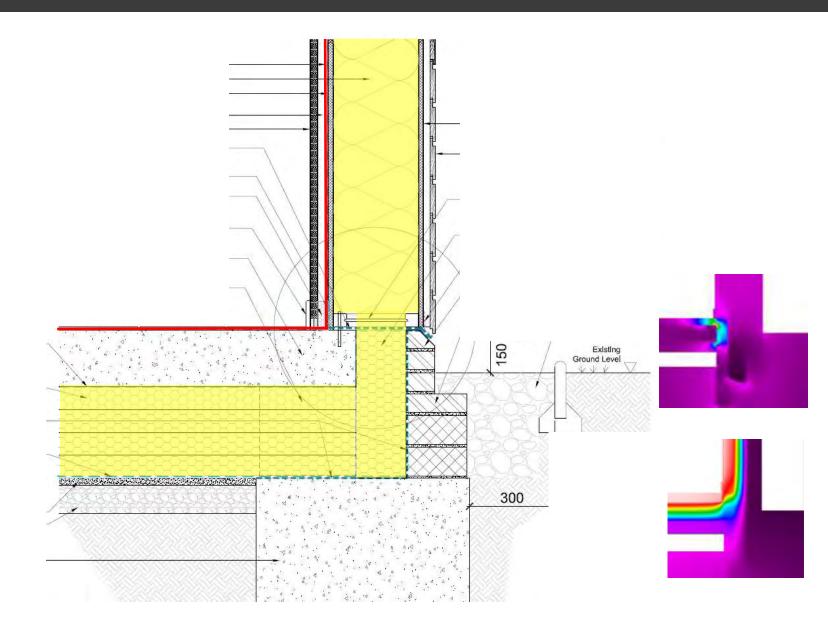


U Values, W/(m²K)

- Walls 0.137
- Roof 0.113
- Floor 0.122
- Window glass 0.6 & 0.7
- Window frame 0.97



No Cold Bridges









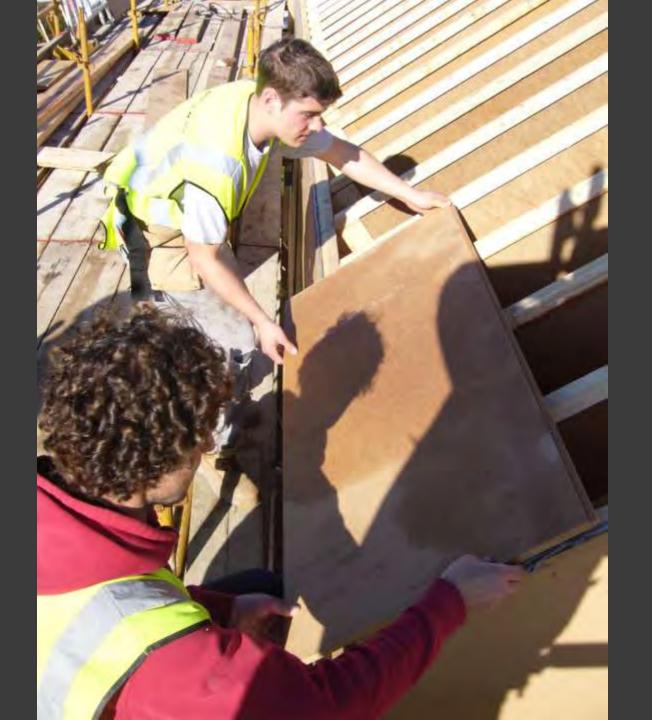










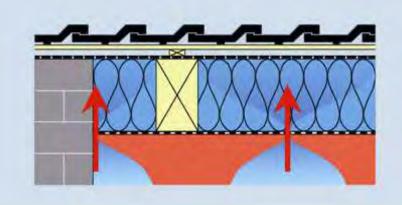


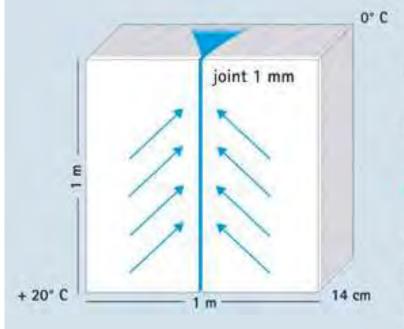
Why not Air tightness layer on outside only?

Advantages

- Easy to apply no problems at floor junctions?
- No problems with service penetrations
- No need for OSB or tapes on inside

Gaps in Vapour Control layer





No joints: 0.5 g water/m x 24h

(diffusion)

With 1 mm joint: 800 g water/m' x 24h

(convection)

Moisture increase by a factor of 1600

Measurement carried out by: Institute for Building Physics, Stuttgart; +20° C indoors and 0° C outdoors a pressure difference of 20 Pa (equivalent to wind force 3-4) using conventional, fibrous insulating material Source: DBZ 12/89, pp 1639

Why not Air tightness layer on outside only?

Disadvantages

- Need a good vapour check on inside
- Vapour check needs to be airtight
- No air gaps between vapour check and insulation
- So why have 2 airtightness layers?
- Wind barrier on outside will stop thermal bypass

The requirements

Air changes per hour

 $N_{50}(ACH) = 0.6h^{-1} @ 50Pa$

Average of Positive & Negative

Effective leakage area 0.01m2

(3 bed house)

