BRE Housing Defects Prevention Unit

Defect Action Sheet (Design)

Defects in housing and how to avoid them

DAS 133

June 1989

4051

CI/SfB 8(42)R(M2)(L27)

Solid external walls: internal dry-lining — preventing summer condensation

FAILURE: **Condensation on back of vapour control layer, staining of internal finishes, rot in studs or joists, wetting of insulation**

DEFECTS: **No external protection; no ventilation to outside from behind dry-lining**

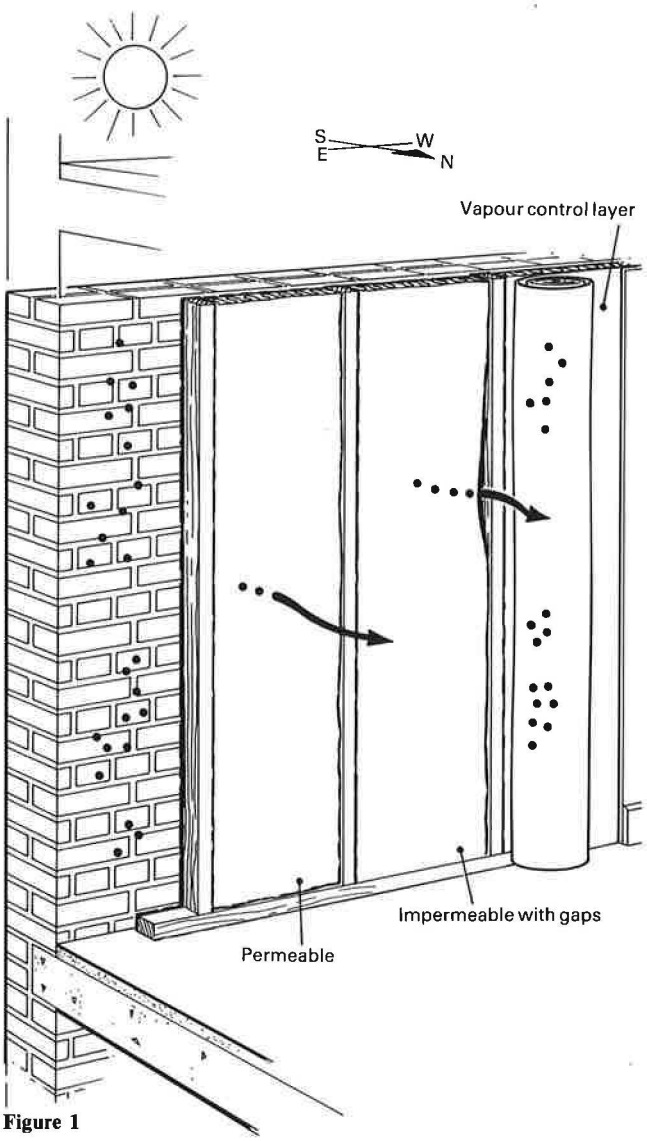

Figure 1

During cold weather interstitial condensation occurring within internally insulated solid walls is normally prevented by a vapour control layer on the warm (internal) side of the insulation. However, in summer, strong sun on unprotected walls can drive moisture towards the inside of the building and through permeable insulation or through gaps between less permeable insulation, to condense on the outside face of the vapour control layer. Moisture contents of the external wall need not be high for this failure to occur. Once condensation has occurred it stays for many days, as transfer out is much slower than transfer in. The condensation can be prevented by internal heating, but this is not an option for the summer. Since the condensation occurs behind a waterproof vapour control layer it is often not noticed.

Strong ***sun on*** damp solid external ***walls*** can cause ***condensation*** to occur, which can trickle down the vapour control layer, and ***wet*** timber.

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PREVENTION

Principle — The moisture must be reduced to a level at which condensation will not occur, by external protection to the wall or by ventilation.

Practice

- Assess risk before deciding to insulate thermally solid external walls on the inside;
  — external insulation avoids this type of failure.

- Decide which walls are at risk, Figure 2; ie, walls facing East South East to West South West.
  EITHER
- Specify shading for walls exposed to direct sun or specify covering with tile hanging or other claddings;
  OR
- Specify a cavity ventilated to the outside, Figure 3;
  — specify for solid masonry walls, vertical joints to be raked out through the full thickness of the wall at top and bottom of each storey height, or specify slot ventilators angled to shed water outwards;
  — horizontal spacing not to exceed 1.5 metre, Figure 4;
  — specify for existing walls of other materials, ventilation holes to give an equivalent open area of 500 mm² per metre run.

Note: Specifying the omission of a vapour control layer is not an acceptable solution. Summer condensation could be deposited behind low permeability internal finishes.

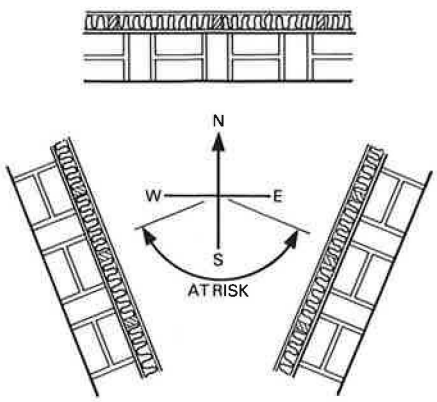

Figure 2

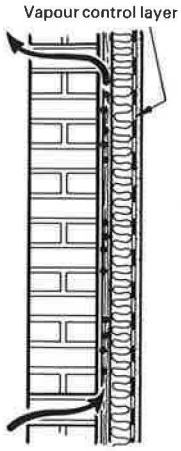

Figure 3

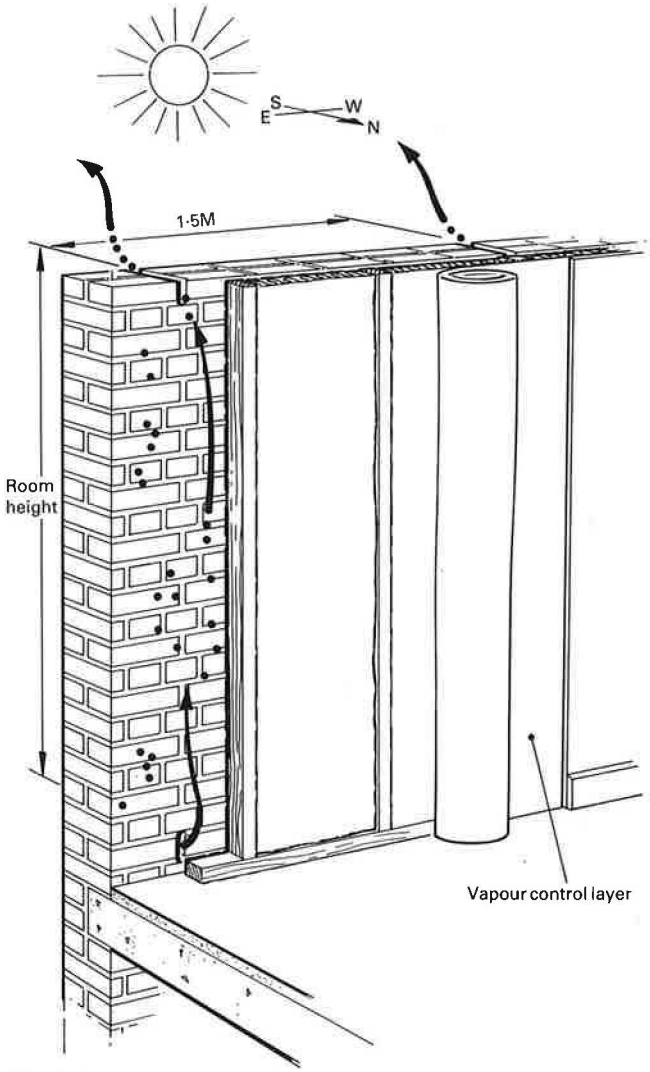

Figure 4

REFERENCES AND FURTHER READING

☐ **Southern J R.** Condensation on the vapour check of battened internally insulated solid walls. *BRE Information Paper* IP 12/88, 1988.

☐ **Building Research Establishment** External walls : reducing the risk from interstitial condensation. BRE *Defect Action Sheet* DAS 6. 1982.

Defect Action Sheets are produced by the BRE Defects Prevention Unit. They are intended to remind and inform designers and site supervisory staff of ways of avoiding some of the most troublesome defects which have beset Local Authority housing in recent years. The advice is based on the most authoritative information available at the date of issue and frequently also on field assessments, but it is inevitably generalised and users should ensure that it is relevant to the specific circumstances in which they seek to apply it. For technical enquiries arising from this sheet please contact the HDPU at the address overleaf.
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Price group 1 Also available by subscription

Printed in the UK for HMSO. Dd.8244958, 11/89, C10, 38938.