



Damp Proofing - A Review of Good Practice

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Water penetration is a prime cause of deterioration in building structures and materials and the presence of excess moisture encourages the growth of moulds and wood rotting fungi. Because of this, building regulations require that buildings are so designed that water neither damages the fabric nor penetrates to the interior where it may constitute a health hazard as well as spoiling decorations. Source: BRE Digest 380

When considering moisture exclusion designers need to consider both the choice of DPC materials and the installation of damp proof courses in walls. Our published details show best practice in the use of our damp proofing products, based on long experience and compliance with published standards. We offer simple practical solutions which can be modified to suit a wide variety of design solutions provided the basic principles are retained.

More recently the BRE have produced the document 'Thermal Insulation: Avoiding Risks'. This emphasises that the damp proof course or membrane is the critical interface between building elements in terms of energy efficient detailing as required under the revised Building Regulations. See also the Approved Document, Part L 1995 Edition, 'Conservation of Fuel and Power'.

The earlier Approved Document C, (second impression 1992), sets out requirements for "Site Preparation and Resistance to Moisture" and also covers ground contaminants which can be countered by using Visqueen Building Products gas resistant (GR) products. The diagrams in section C4 highlight the need for a 50 mm cavity in all cavity walls apart from those with solid fill - a point which requires very careful consideration when detailing cavity trays and assessing the level of weather exposure.

However the key reference document for damp proofing above ground is BS 8215:1991 Design & Installation of Damp Proof Courses in Masonry Construction. Section 5 of this standard outlines the key damp proofing considerations that the designer should take into account. The following points are by no means a comprehensive summary of the contents of the standard (we strongly recommend that the standard is carefully studied) but are a precis of some valuable good practice guidelines contained in the BS.

Exposure Conditions

The designer should first determine the degree of exposure, the risk of penetration from any direction and the consequences of water penetration. The use of a UK exposure assesses the degree of severity of conditions that the building is likely to encounter and helps the designer to make the appropriate form of construction to meet these conditions.

Primary Protection

Provision should be made for weathered copings, sills, overhangs and projections, which will help to reduce the likelihood of moisture penetration into a building.

Integral System

DPCs should be designed in conjunction with membranes and flashings to form a complete system of protection impervious to moisture.

DPC Selection

The four principal considerations suggested for DPC selection are Durability, Resistance to Stress, Pliability and Compatibility.

Cavity Trays

The standard recommends that where there are changes of direction of a cavity tray, prefabricated units are used to avoid complex bending and folding on site. It states however that these prefabricated units should be sealed to the cavity tray.

DPC Location

The standard recommends that DPCs are located in every external wall immediately above ground level, beneath sills and copings, in parapet walls or pitched and flat roof abutments. This advice then ensures that the building is fully protected from moisture.

DPCs in Cavity Walling

BS 8215 emphasises that DPCs in cavity walls should be designed with particular care. Among the key points mentioned are:

- Assume that rainwater will run down the inner surface of the outer leaf, so DPC design should ensure that water is deflected away from the inner leaf and discharged through weepholes.
- To form effective barriers can give rise to complex three dimensional shapes and it is recommended by the standard that prefabricated units are used.
- Horizontal DPCs bridging the cavity should be stepped up by not less than 150mm from outer to inner leaf and should preferably be formed in one piece. Any necessary joints should be fully supported, lapped and sealed.
- Discontinuous cavity trays should be fitted with sealed stop-ends.
- Vertical DPCs should be located at jambs and lap over the sill DPC.

Other Standards

BS 8215 is by no means the only standard that refers to damp proofing. We include a more comprehensive reading list at the end of this section. This includes British Standard 8102 (Protection against water from the ground) and British Standard 5628 (part 3, section 3) which has information on Movement Joints (20) and Exclusion of Moisture (21). Some useful diagrams indicating the need for stop ends to lintels and weepholes are included.

The diagrams of internal and external tanking in BS 8102 demonstrate the principles clearly, but not the detail of installation. Zedex basement details are intended to assist designer and installer to produce a practical and effective solution

Housing

Housing specialists will know that the NHBC technical standards are essential reading. In particular, we support the view that dpc's are required over all lintels. Keeping the waterproof membrane independent of the structure is an effective 'second line of defence' and enables a more effective stop-end solution.

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Exposure Zones

Approximate Wind
Driven Rain
(Litres/m² per spell)



Summary

Continuity is the key to successful damp proofing and perhaps this point is not sufficiently emphasised in published standards.

Compatibility of adjacent products is equally significant. Mastic / dpc adhesion, solvent based stains / dpc reaction for example.

Successful damp proofing depends on a combination of good design, correct installation and a quality product.

At the interface of so many materials, considerable technical knowledge is required to ensure long term effectiveness, not simply short term compliance.

Visqueen Building Products can provide high quality compatible products and a high level of technical advice. As winners of an 'Investors in People' award, we aim to work in partnership with you to achieve the best possible solution. We are also committed to 'continuing' Professional Development (CPD) and are pleased to offer 'tailor made' short seminar's for your organisation, on request.

Useful References

British Standards

BS 743 1970 Materials for DPCs

BS 5628 Code of Practice for the Use of Masonry
1992 Part 1: Structural Use of Unreinforced Masonry
1985 Part 3: Materials and Components, Design
and Workmanship

BS 5642 Cills and Copings
Part 1: Specification for window cills of stone and concrete

BS 5930 1981 Code of Practice for Site Investigations

BS 6515 1984 Specification for polyethylene DPC for use
with masonry.

BS 8000 Workmanship on Building Sites
1989 Part 3: Code of Practice for masonry
1989 Part 4: Waterproofing

BS 8007 Code of Practice for concrete structures for retaining
aqueous liquids

BS 8102 1990 Code of Practice for the protection of structures
against water from the ground

BS 8215 1991 Code of Practice for the Design and Installation
of Damp Proof Courses in masonry construction

BS 8301 1985 Code of Practice for building drainage

DD 86 1983 Damp Proof Courses
Part 3: Guide to the characteristic strengths of Damp
Proof Course material in masonry

DD 93: Exposure to wind driven rain

CP 102: 1973 Protection of Buildings against water from
the ground

Other Sources -

Building Research Establishment

Reports

Thermal Insulation : Avoiding Risks Second Edition 1994 Radon:
Protective Measures for New Dwellings Construction Of New
Buildings On Gas Contaminated Land

Digests

362 Building Mortar 380 Damp Proof Courses

Defect Action Sheets

12 Cavity trays in external cavity walls: preventing
water penetration

94 Masonry chimneys: DPCs and flashings - location

95 Masonry chimneys: DPCs and flashings - installation

98 Windows: resisting rain penetration at perimeter joints

106 Cavity parapets - avoiding rain penetration

107 Cavity Parapets - installation of copings, DPCs, trays
and flashings

114 Slated and tiled pitch roofs: flashings and cavity trays for
step and stagger layouts - specification

129 Free-standing masonry boundary walls: stability and
movement (Design)

130 Free-standing masonry boundary walls: materials and
construction (Design)

Other Sources -

National Building Regulations (England & Wales, Scotland,
Northern Ireland) Relevant Sections

National Building Specifications

Relevant Sections

National Housebuilders Registration Council

Approved Standards

With increasing emphasis on Thermal Standards, cross
referencing may be necessary with BS 5616, BS 6232 and
BS 8208.

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Further product and technical information is available from Visqueen Building Products web site. The site includes downloadable technical data sheets and typical installation details.

