PROTIMETER REVISITED FOR LARGE SCALE DAMP INVESTIGATIONS

A. L. Airey[1]
[1]Airey Taylor Consulting, Perth, Australia

SUMMARY: Damp in structures precedes eventual rusting. "Protimeter Surveymaster" is a non-destructive testing instrument favoured by building inspectors assessing bathroom leaks and the like. The Protimeter measures the reflected radiofrequency signal some 10-19 millimetres into concrete or other substrates, providing a dimensionless result for moisture that is dependent on the calibration supplied by the manufacturer. The proprietary nature of the instrument's operation and calibration can thus potentially pose an issue for expert witnesses. Case studies herein comprise housing, commercial and community structures that were investigated with firstly a hand held combined moisture/temperature/surface relative humidity meter, the Protimeter, and by means of in-slab relative humidity tests. The investigations in Perth's summer of 40 percent relative humidity confirmed that moisture transiting slabs and walls can be primarily gaseous and registering as "dry" in either surface moisture content or surface relative humidity tests, but with the aid of the Protimeter easily diagnosed. The results of the modern case studies suggests sub-slab vapour barriers are generally both designed and constructed but there is a tendency to overlook the need to wrap the vapour barrier around the edges of slabs and footings, causing a modern chapter of 19th century rising damp problems to recur.

Keywords: Rising Damp, Concrete, Vinyl, Footing Design

1. INTRODUCTION

1.1 A brief history of Rising Damp in Structures

The NSW Heritage Association [1] reports that before the development of brick cavity walls, in 19th century historic masonry structures "rising damp is caused by capillary action (or suction) drawing water from the ground through the network of pores in a permeable masonry material….until the upward suction is balanced by the downward pull of gravity". The height of the damp related to the size of the pores; the smaller the pores the more elevated the damp. Once reaching the maximum extent of suction the moisture then evaporates. A typical height for such evaporation is in the 300millimetre (mm)-1 metre mark allowing a "tide line" of exfoliating paint, fretting brick and deposited salts on the walls of the structure. The damage from damp was most often, limited to the walls owing to an understanding even in the 19th century that the sub-floor areas must be well ventilated; and that if this was not in place wood rot of the floorboards and toxic mould growth could occur. It was soon identified that a flashing (damp proof course) could be added to the wall prevented the rising damp and the National Construction Code of Australia [2] provides excellent guidance on sub-floor circulation required in such structures. Retrospective remedial solutions for heritage structures are available in the form of silicone-injected dampcourses, electro-osmotic systems and mechanical ventilation [1].