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Other criteria for building and walling systems

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Durability of buildings

The durability of a building product or element or of a building may be defined as the period for which it is able to fulfill its intended function satisfactorily when subjected to normal use, assuming that it is reasonably maintained at regular intervals. Durability can also be defined as the retention of performance and appearance over the expected service life.

The expected life of a building will be dictated by the life of its various components (eg foundations, walls, framework, floors and roof), the quality of the materials used and the standard of workmanship maintained in their manufacture and erection.

It is accepted that the useful life of certain non-structural components, finishes, decoration and in some cases, services, may be considerably shorter than that of the building itself. However, the maintenance required to keep them in good order should not be excessive, nor should the repair or replacement of such components or services be necessary at unreasonable intervals. Ease and cost of replacement should therefore be taken into account at the design stage of buildings.

In assessing the durability or expected useful life of buildings, Agrément South Africa assumes that the structure and foundations have been designed in accordance with best practice for the particular location in terms of the climatic and soil conditions of the site. Durability is furthermore addressed, often implicitly, in the Agrément performance criteria for condensation, strength and stability, and water penetration and damp-proofing.

The assessment of the durability of a building takes account of the effect on the performance of the structure, of physical damage and weathering due to:

- corrosion
- wetting
- drying
- heating
- freezing
- solar radiation
- chemical reaction etc.

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Where applicable, such an assessment will indicate precautions to be taken against possible deterioration of certain materials and components that may result from warping, swelling, shrinking, cracking, corrosion of steel components (including reinforcement), premature ageing, etc. Specialised coatings or sealants having a limited life or which are susceptible to local damage cannot be depended upon entirely to prevent structural deterioration for whatever reason when in practice, such products are unlikely to be adequately maintained.

Inadequate or inappropriate maintenance is often attributable to a lack of awareness by the end user of the need for, or the importance of, regular maintenance. Ignorance about the need for specialised coatings or sealants, lack of specialised skills and equipment, and financial constraints can also be major obstacles to proper maintenance, which in turn can lead to premature failure of components or materials. Even in conventional housing, some end users do not appreciate the need for regular maintenance, sometimes due to a lack of even simple technical skills or perhaps the lack of financial resources. However, in view of the novelty of innovative building systems, care should be taken to ensure that susceptible products are not used where the need for structural repair is unlikely to be recognised or where it is indeed impractical to effect such repairs. Where relevant, the manufacturer should be able to demonstrate that the maintenance required is practical and can be carried out by a person with average skills and without specialised equipment.

The climatic conditions where the subject is to be used are also taken into account since they will have a significant effect on the rate of deterioration of the materials.

There are no hard and fast rules that can be laid down for assessing the expected useful life of buildings. Such an assessment is a complex task and requires that the experts consulted by Agrément South Africa have extensive experience and knowledge in this field.

Ideally, a site inspection should be made of examples of the subject that have been exposed for several years to the conditions and environment that will be covered by the certificate. However, such examples are often not available and the likely behaviour of the components and materials under the expected conditions have to be assessed using tests designed to simulate and accelerate the effects of these conditions. Where feasible and appropriate, specimens may therefore be subjected to accelerated weathering tests, abrasion tests, impact tests, alternate cycles of wetting and drying or heating and cooling, salt spray tests, etc and to medium or long term exposure to the weather on Agrément South Africa's test site. In addition, post-certification factory and site inspections by Agrément South Africa provide ongoing information on the durability of the subject.

When the expected useful life of the subject is estimated, use is also made of the research findings and experience of the CSIR as well as the work of other relevant organisations, practicing consultants and the peer organisations of Agrément South Africa in the [World Federation of Technical Assessment Organisations](#).