

INDICATORS FOR FUNCTIONAL SERVICE LIFE OF BUILDING STRUCTURES

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Rijk Blok , Patrick Teuffel

¹ TU/e (Department of the Built Environment, Eindhoven University of Technology, The Netherlands)
e-mail authors: R.Blok@tue.nl ; P.M.Teuffel@tue.nl web page: <http://www.tue.nl/sd>

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ABSTRACT

The Estimated Service Life, ESL, is of a major influence in many building assessments. The comparison and optimization of design alternatives but also the outcome of LCA calculations depend directly on the accuracy of this ESL [1]. Up till now building engineers have focussed on Technical Service Life, but more and more the Functional Service Life is decisive in how long a building can be used. It can be expected that the Functional Service Life of a building structure is influenced by the ability of the building to accommodate changes during its Service Life: Conversion Potential. Flexibility is here seen as a property of the building that represents the building's ability to change and adapt to new requirements and upgrades, for example the possibility to replace and upgrade the buildings façade or its service installations [2] [3].

To study Flexibility in more detail, it is necessary to qualify and quantify this property. This paper discusses the way in which Structural Flexibility and Conversion Potential can be defined using so-called Flexibility indicators. With this a methodology was developed to assess Structural Flexibility in buildings. The method was applied in a research on 18 different buildings in Eindhoven, Netherlands. Half of the buildings were buildings to be demolished, the other half have been, or shortly will be, refurbished.

The measured Flexibility results of the 18 buildings have been linked to each of the buildings achieved Service Life in order to find a relation between the buildings Flexibility properties and the Service Life. The first preliminary results indicate that buildings with an above average Structural Flexibility showed a higher survival probability (an increased chance of a longer Service Life) compared to the buildings with a below average Structural Flexibility.

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