

STRUCTURAL APPRAISAL OF EXISTING BUILDINGS, INCLUDING FOR A MATERIAL CHANGE OF USE

Part 2: Preparing for structural appraisal

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This Digest gives guidance to professional engineers on the structural appraisal of existing buildings, including making a structural appraisal for a material change of use.

Part 2 introduces structural appraisal, and discusses the factors that might influence the outcome of an appraisal, and what might be involved in preparing for it. It looks at the many factors that can influence the structural behaviour and performance of buildings, including: through-life perspectives; cultural heritage issues; sources of hazard and risk; accidental loadings and actions; structural systems and materials; stability and resilience of buildings; loads and actions; verification criteria; safety considerations; material influences; defects, deterioration and damage mechanisms and sustainability issues.

1 INTRODUCTION TO STRUCTURAL APPRAISAL

A structural appraisal is undertaken to check the adequacy of an existing structure with respect to a current or future use. Often the scope of these activities may extend to making a prognosis of future behaviour and safety. Structural appraisal is therefore a process of gathering and evaluating information about the form and current condition of a structure and its components, its service environment and general circumstances, so that its adequacy for future service can be established against specified performance requirements, such as loadings, actions, or durability.

The art and processes of appraising an existing structure are different from those associated with



Figure 1: A modern building complex

designing a new building, where the flow of forces follows the choice of structural form and materials, and the procedures for structural analysis follow on. In design, the engineer can decide on appropriate means for satisfying issues of structural stability, load capacity, and serviceability. In appraisal, the engineer has to deal with an existing building or structure in which aspects of the structural form and the characteristics of the materials are established, but are generally much less well known. Although, notionally, these are definable qualities, depending upon the amount spent on the task, the appraising engineer must determine the condition of the existing building or structure and form an opinion on its suitability for future use in the envisaged circumstances.