REPRESENTATION OF A REINFORCED CONCRETE DESIGN CODE AS AN OBJECT ORIENTED MODEL

BY

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Abstract

Design standards comprise many knowledge types such as text, rules, equations, tables, graphs and figures. The attempt is to encode the standard without distorting the format of the standard, i.e. to represent the standard clauses and tables in the same format as in the standard. This effort will facilitate changes to the standards without much variation to the programme code.

This thesis presents a framework to model standards using the Object Oriented Programming paradigm. It also presents the concept of a common interface, i.e. to accommodate several design standards for reinforced concrete design in one module; however, implementation is carried out only for BS8110. The programme uses an inferencing mechanism for execution, which is a similar method of execution to that of a standard's user; it is not a hard coded structured programme. This is a novel concept when compared to the available software for reinforced concrete design.

The literature review investigates the structure of typical standards and the available standards processing technique such as Predicate Logic, Decision Tables, Production Systems and Semantic Networks before choosing Object Oriented programming as the preferred one. The review also compares both the provisions and design outputs of several reinforced concrete standards.

The Common Interface for Design Standards (COIDS) has three main modules (or models), namely the Product Model, Standards Model and Interaction Model. The Product Model handles the product data, e.g. Frame Data. The Standards Model handles the standards data, i.e. it contains all the knowledge in a standard. The Interaction Model handles the data exchange between the user-,COIDS objects and external software. It transfers data from the COIDS to external analysis software and maps analysis output files to COIDS. An Object Oriented Shell called KAPPA was used to develop the object oriented model.