

Durability of bonded-in rod connections

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Summary

This project aims to provide a better understanding of the performance and durability of bonded-in rod connections used for the in-situ repair and reinforcement of historic and contemporary timber structures. The specific objectives of this study are the: (a) determination of typical environmental service conditions expected for these rehabilitation systems; (b) assessment of the effect of preparation and service conditions on the performance and durability of the bulk adhesives; (c) investigation of possible ways of improving the durability of adhesively bonded structural timber joints; (d) development of an experimental methodology to assess the durability of bonded-in rod connections with relation to realistic working loads and the effect of realistic thermal and moisture effects; (e) provision of recommendations for test procedures and acceptance criteria for the selection of candidate repair system materials for specific applications.

1. Introduction

Connections and reinforcement employing rods bonded in to timber have been used for many years. Although these connections have been found to exhibit high initial bond strengths to timber, and excellent durability in applications with other substrates, no test standards or commonly accepted specifications exist today for assessing and approving adhesives to be used for bonded-in rod applications. Because of this, concerns about their reliability still persist. The project here presented was created to address these concerns so that the better understanding of the performance and durability of these bonded systems and the development of a test method and associated acceptance criteria for the selection of candidate repair system materials for specific applications may contribute to their wider exploitation and to the development of models to predict the long-term behaviour of bonded-in rod connections.

2. Project overview

The project covers four main topics which correspond to the specific objectives defined above and are briefly described next.