

## **NEW DURABILITY ASSESSMENT METHOD FOR BONDED CONNECTIONS USED IN THE IN-SITU REHABILITATION OF TIMBER STRUCTURES**

João Custódio<sup>1</sup>, Helena Cruz<sup>1</sup>, James Broughton<sup>2</sup>

<sup>1</sup>) Laboratório Nacional de Engenharia Civil, Lisboa, Portugal

<sup>2</sup>) Oxford Brookes University, Oxford, United Kingdom

### **Abstract**

In-situ rehabilitation/restoration systems for timber structures involving bonded-in rods represent an efficient alternative method when compared to the very intrusive techniques currently used. However, in spite of the advantages associated to these low intrusive methods, their use is still restrained by the lack of knowledge about their durability. In order to contribute to the ongoing discussion on the reliability of these systems, a study was conducted to evaluate the influence of service temperature and humidity, timber species, realistic load history and applied stresses on the performance and durability of bonded-in rod connections made with two commercial two-component structural epoxy adhesives. From the investigation it was possible to develop a novel method to assess the long-term behaviour of bonded joints between timber and various adhesives and connecting materials suitable for timber structures rehabilitation/conservation. The data collected so far using the RPAT (realistic performance assessment test) appears to indicate that the developed method is assessing correctly the end-use performance for different adhesives as well as for different timbers

**Keywords:** timber structures; epoxy adhesives; bonded-in rod connections; durability; realistic test.