

Research on Post-Installed Reinforcement for Structural Retrofitting

Norbert RANDL
Professor
Carinthia University of
Applied Sciences
Spittal/Drau, Austria
n.randl@cuas.at



Norbert Randl, born 1967, received his civil engineering degree from the University of Innsbruck, Austria. He worked for the Hilti Corporation in Germany before becoming Professor at the Carinthia University of Applied Sciences, Austria. His main fields of research are related to strengthening and behaviour of concrete structures as well as post-installed fastenings.

Summary

Post-installed reinforcement bars (rebars) are used for different purposes such as attaching new concrete to existing RC members e.g. when retrofitting, enabling the flow of forces via joints or strengthening existing structures by means of additional straight reinforcement bars. Such bars are typically inserted into a pre-drilled hole and glued in with special appropriate mortars and usually developed in a way that they lead to at least the same bond strength as if the bars were cast-in.

A research project conducted recently at the Carinthia University of Applied Sciences (CUAS) focused on the load bearing behaviour of rebars post-installed in different concrete substrates and glued-in with several types of approved mortars. Pull-out tests performed in normal and higher strength concretes revealed that not every mortar – even if approved for normal strength concrete – is appropriate also for use in high performance concretes.

Keywords: Post-installed, rebar, bond, adhesion, pull-out, strengthening, retrofitting, rehabilitation

1. Introduction

Post-installed rebars are commonly used when during the erection process newer parts of an emerging structure are cast against already existing sections and loads have to be transferred via the joints (example see Fig. 1).

Above that the completion, extension and retrofitting of existing structures as well as strengthening of members in the sense of adding more reinforcement are of main interest. Moreover sometimes post-installed rebars are preferred to cast in reinforcement for the sake of more flexibility, e.g. when anchoring footings of columns.

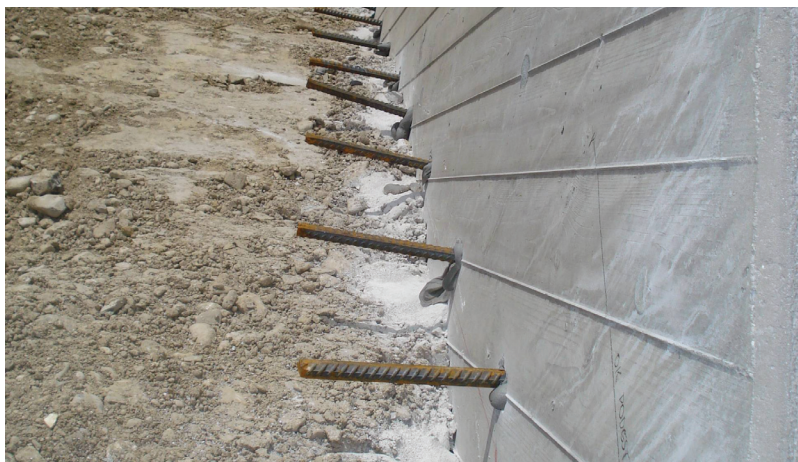


Fig. 1: Post-installed reinforcement at a bridge abutment

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