

Anchorage of externally bonded steel plates in the area of bending moments with changing sign

On continuous strengthened reinforced concrete beams due to the unfavorable arrangement of the live load a change in the sign of the bending moment can occur in the anchorage region of the externally bonded reinforcement. This means that the externally bonded reinforcement gets tensile as well as compression force. The behavior of the externally bonded reinforcement in this changing area, especially the bond force transfer of the externally bonded longitudinal reinforcement under compression, has not been investigated so far. Especially the externally bonded steel plates, which are used with a thickness of up to 15 mm can get due to their high axial stiffness high forces in this area, which must be transferred by the concrete section.

This research report first considers previous investigations, which are in touch with this problem. Based on this, bond compression tests with different thick steel plates are carried out, in order to investigate the behavior of the bond under compression. To verify the test results and for acquiring additional member specific effects two tests on a continuous beam, on which steel plates were anchored far into the compression area were carried out.

Based on the performed experimental studies recommendations for dealing with this problem in the design are given finally.