

Gap filler to eliminate the hole play between base plate and channel bolts installed in anchor channels to sustain higher seismic loads

Christoph Mahrenholtz, Sven Giesenbauer

Jordahl (PohlCon), Berlin, Germany

Akanshu Sharma

Purdue University, Lafayette, IN, USA

Gopal Vutha

Profab Engineers (PohlCon JV), Navi Mumbai, Maharashtra, India

Contact: christoph.mahrenholtz@pohlcon.com

Abstract

Anchor channels are a common fastening system for attaching highly loaded base plates of non-structural and structural components to reinforced concrete structures using channel bolts. The reliability and robustness makes this fastening system also popular for seismic applications. An innovative gap filler set was developed to eliminate the gap between the base plate and the channel bolt as well as between the channel bolt and anchor channel, and thus to further improve the seismic performance. Following the introduction of anchor channels and channel bolts in the context of seismic loading, some background information is provided, and qualification as well as design is addressed. Finally, monotonic (static) and cyclic (seismic) tests on channel bolts installed without and with gap filler are presented and discussed to demonstrate the benefits of gap filling.

Keywords: Anchor channels; channel bolts; static and seismic performance; concrete fastener.

1 Introduction

Channel bolts installed in cast-in anchor channels enable the sound connection of non-structural and structural components to reinforced concrete structures. Anchor channel-channel bolt-systems, also simply known as anchor channels, reliably take up monotonic and cyclic loads even under extreme conditions to be anticipated in seismic regions. This is particularly relevant for critical infrastructure such as high speed railway bridges (Figure 1).



Figure 1. Taiwan Highspeed Railway viaduct in a seismically active country