ABSTRACT

At high speed the standard ballasted track structure must be optimised to improve its response under dynamic loading. Measurements of the vertical vibration velocity in the ballast demonstrated increase of the effective rms-values by a factor 2 when the speed is risen from 160 km/h to 250 km/h. Possibilities are the introduction of more resiliency in different levels of the track: either by a high resilient fastening system or by sleeper pads or by sub-ballast mats at the bottom of the ballast bed.

Ideally suited for high speed is on the other hand an optimised ballastless track. In Germany exist more than 800 km of slab track; in May 2006 the newest high speed line Nuremberg – Ingolstadt (v = 300 km/h) in a length of 89 km (9 tunnels in a total length of 27 km) was opened for service. About 50 % of the length are constructed in a modified “Rheda-type” structure and 50 % with coupled prefabricated concrete slabs. These structure types shall be used in large high speed projects in Asia, too. General design principles of ballastless tracks and behaviour are outlined.