

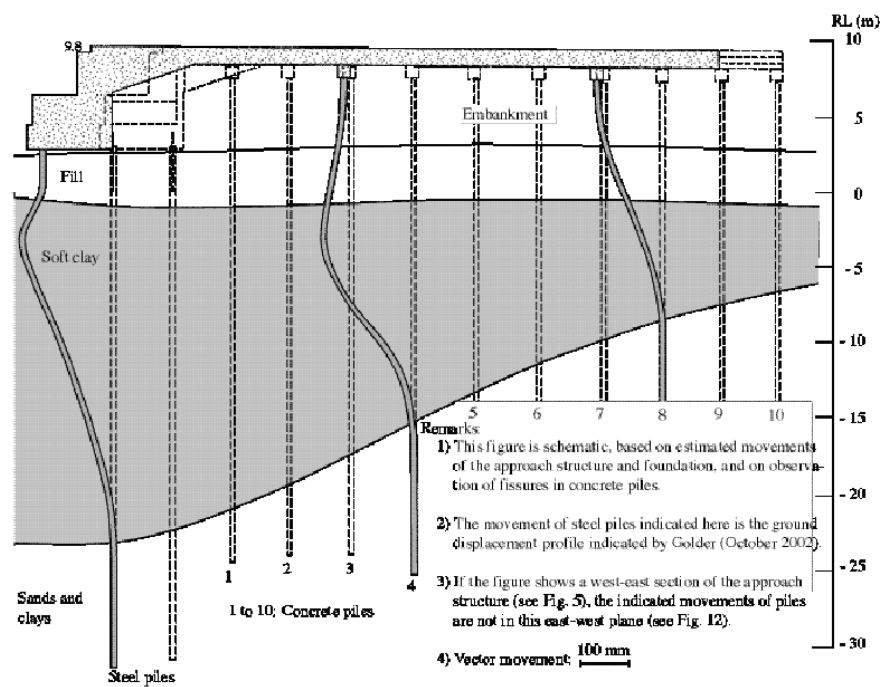
Selected Projects

of

Martin Pircher, DI, PhD

Title **AHK18 - Koralmbahn**, Carinthia, Austria – Project engineer.
 Client Ingenieurbüro Schallaschek, Carinthia.
 Services Structural analysis and design check according to Ö-Norm.
 Description Two parallel 3-span composite railway bridges with skew support axis. Per bridge there are two steel I-girders with an on-site added concrete deck. At the support axis transverse steel girders connect the longitudinal girders.

Title **Goongoongup Bridge**, Perth, Australia.
 Client Railway management West-Australia.
 Services Expertise of a damage event, monitoring and solution suggestion.
 Description The existing Goongoongup railway bridge was originally completed as a 7-span incremental launching bridge. The magnitude of the settlement in the area of one abutment led introduced unexpected high displacements of the substructure. A monitoring program was installed to evaluate the development of the displacements over the time. In addition to that a numeric model was developed and calibrated with the on-site measurements. The 3-dimensional model of the abutment structure allowed to evaluate possible solutions for the repair work.



Title **Western Sydney Orbital**, Sydney, Australia.

Client Maunsell – Australia, University of Western Sydney.

Services Development and monitoring of a novel railway crossing.

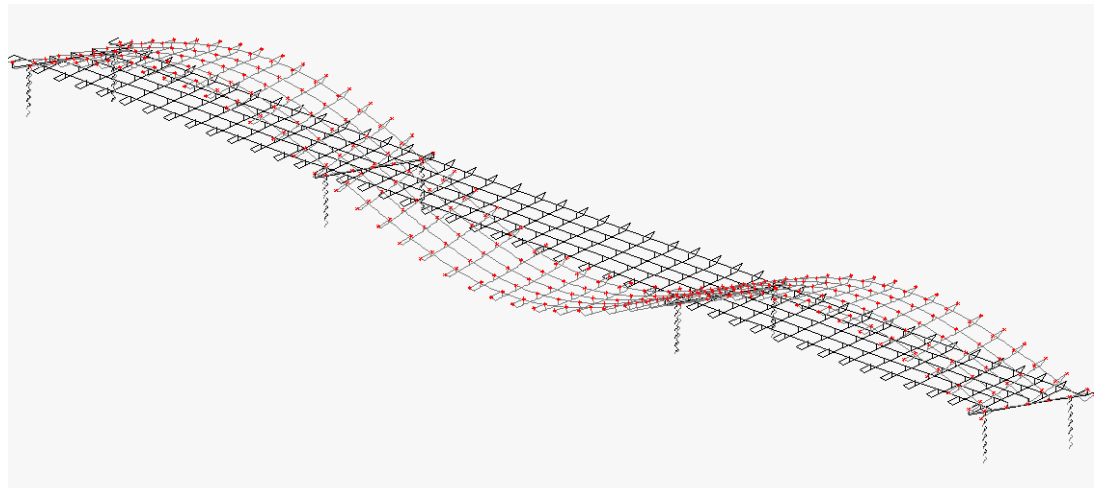
Description The concrete deck of the M7 highway near Sydney is constructed as a solid concrete slab. In order to reduce costs a new system was developed to create an integral connection of the bridge deck to the roadway. This solution would make the installation of dilatations obsolete.
A special numeric model was developed to check and control the impact and effects of the temperature gradient, creep and shrinkage non-linear material behaviour of cracking concrete also including the tension stiffening of the reinforcement steel.
Fibre sensors were installed on a few selected bridges in order to compare the numeric results with the long term behaviour on site.

Title **Railway bridges**, Upper Austria, Austria.

Client Austrian Bundesbahnen.

Services Measurement and numerical modelling of vibrations of railway bridges.

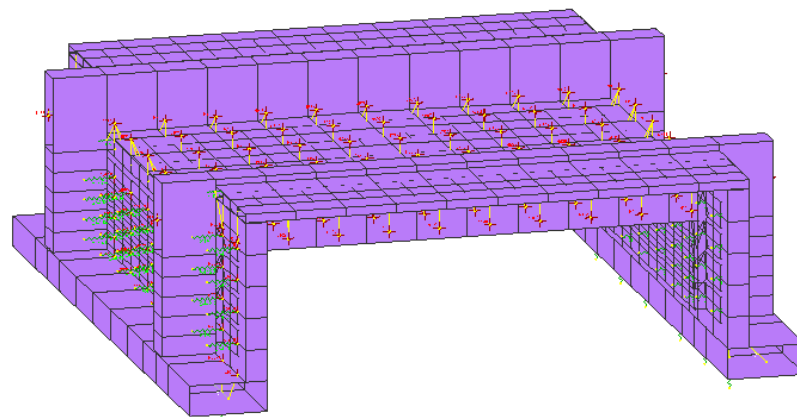
Description The extension of the existing railway connection between Vienna (Austria) and Munich (Germany) allowed increasing the velocity of the trains up to 250km/h. The authorities wanted to be sure that all existing bridges along the railway line withstand the dynamic impacts caused by the higher velocity. A combination of measurements and numeric simulations was done for a series of critical structures.



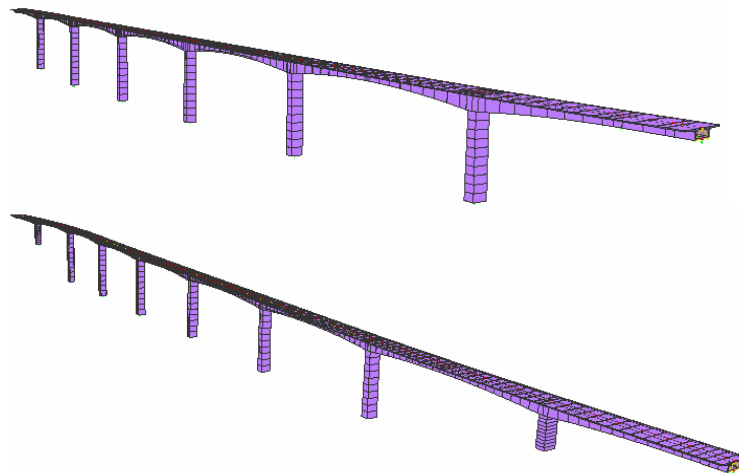
- Title **Tempisque Bridge**, Costa Rica.
- Client VCE, Taipei.
- Services Expertise of a damage event, restoration suggestion.
- Description During the stressing of one of the cables the anchorage at the deck failed. Due to the sudden increase of load the geometry of the deck as well as the force distribution on all other cables changed. All structural parts needed careful checking to allow the repair of the structure, in addition to that a detailed study with the goal to find the reason for the failure was undertaken. Based on the results a proposal for the reconstruction was done. The bridge was opened for traffic in 2005.



- Title **Sulbach Bridge**, Lower Austria, Austria.
- Client FCP, Vienna.
- Services Dynamical analysis.
- Description This integral bridge required a detailed dynamic study in order to guarantee that trains with velocities up to 250km/h can pass over the structure without exceeding the limits of the EuroCode regulations.



- Title **Waiwera Bridge**, Auckland, New Zealand.
- Client URS Auckland.
- Services Design and calculation.
- Description This seven span pre-stressed concrete bridge has a total length of 532m. Different studies were undertaken to develop the most economical solution. These studies included the erection using precast segments for the cantilevering and for this option a detailed concept was developed.



- Title **Sutong Bridge**, Nantong, China.
- Client HDPI Beijing.
- Services Structural engineering advice.
- Description With a main span of almost 1100m the Sutong bridge will be the biggest cable stay bridge of the world at the time of its completion. Several non-linear effects need to be considered during the simulation and calculation of the bridge erection. The main part of the work was to support the consultant in the modelling of the structural system and the calculation of the construction stages.

