Synopsis
The Seaford Rail Extension Project required a 1.125km long railway viaduct to cross the Onkaparinga Valley and River. The solution chosen was an incrementally launched, concrete box girder, supporting the up and down tracks of the suburban rail line as ballasted track. This presentation will consider the design aspects of this structure. The incremental launch option, with typical spans of 52.3m, was chosen to minimize environmental damage to the sensitive valley. It also results in fewer piers than would be required by a conventional Super Tee alternative. This is particularly relevant considering the high cost of constructing piled foundations in the deep, soft alluvial soils present. In addition, two of the soil strata were assessed as potential zones of liquefaction in the event of an earthquake.

The articulation of the structure is highly unusual. Rail/structure interaction on long ballasted deck bridges, as assessed by European guidelines and standards, can result in unacceptable risk of track buckling. An assessment of this complex phenomenon resulted in partitioning the super-structure into several sections, each with its own longitudinal restraint system. A series of rail expansion switches and deck movement joints prevent build-up of stresses in the rails.

Presentation Overview
• Project Background
• Bridge Form
• Whole of Life
• Construction Method
• Track Structure Interaction
• Superstructure
• Substructure & Foundations
• Lessons Learnt

ABOUT THE SPEAKER
Andreas is a Transport Executive and Leader of the Bridges and Structures Group in Perth, with more than 35 years experience in transport and bridge infrastructure in Australia, New Zealand and Southern Africa. He has worked closely with our clients on major projects leading teams through concept development, design and construction of civil and transport infrastructure.

His experience includes bridges and structures to mitigate disruption to road or rail operations in urban areas, to bridge difficult river and environmentally sensitive sites, and the inspection, assessment, strengthening and upgrading of bridges and structures. He led the detailed design of the Seaford Rail Viaduct (Onkaparinga Valley) superstructure, and has designed numerous bridges using incremental launching and segmental construction methods. Andreas is the author and co-author of 16 technical papers presented at conferences of Austroads, ICE, FIP and IABSE.