Abstract: Advanced Formwork Systems - Design and Construction Aspects

Florian Dieterle^{*1} and Barry Pike²

¹ MSc ETH, Technical Director, CaSE Design, 15 Blue St, North Sydney NSW 2060 Florian.dieterle@case.international
² BE (Civil) UNSW, CaSE Design, 15 Blue St, North Sydney NSW 2060

In the evolving landscape of construction, where urban design drives increasingly complex geometries, the demand for advanced, user-friendly formwork systems has surged. These bespoke systems not only enhance productivity but also mitigate program risks, providing a superior alternative to conventional methods.

This presentation explores the advantages of advanced formwork systems, emphasising their capacity to pre-fabricate large elements off-site, streamline on-site assembly, and facilitate the dismantling of formwork in challenging conditions, such as bridge construction with limited access. The integration of access platforms and reinforcement prefabrication further optimises the construction process, making complex shapes achievable at minimal additional cost while reducing labour, time, and finishing work.

By showcasing recent Australian bridge projects utilising cast-in-place methodologies, including incrementally launched casting beds and balanced cantilever form travellers, the presentation will demonstrate how these design principles can be adapted to more common structures like columns, headstocks, and parapet barriers. The discussion is enriched with visual 4D animations, offering a dynamic view of the construction process.

Key focus areas include:

- Performance specifications for formwork systems.
- Best practices for geometry definition and considerations such as curves, inclined faces and voids.
- Alternative precasting methodologies.
- The integration of formwork with reinforcement systems.
- How combining bespoke steel formwork with precast components can lead to significant savings in weight, structural integrity, and time.

This abstract sets the stage for a comprehensive exploration of advanced formwork systems, promising insights that will drive innovation and efficiency in construction projects. The presentation will uncover the detailed methodologies and case studies that underpin these advancements.

