



**Tonkin & Taylor**

## Numerical Modelling Specialists

Many geotechnical engineering problems involve complexities such as construction staging, soil-structure interaction, non-linear behaviour, pore-pressure effects, in-situ stress conditions and complex deformation mechanisms.

The estimation of displacements caused by excavation activities and imposed on structures by soil and seismic loading is also becoming more important.

Traditional geotechnical analysis techniques may be limited by these issues, so Tonkin & Taylor has adopted sophisticated numerical modelling techniques to solve complex problems. Numerical modelling methods (such as finite-element or finite-difference) are based on fundamental constitutive behaviour, so are ideally suited for the analysis of complex geotechnical systems. Use of these methods may prevent overly conservative solutions and allow more economic design.

### Expertise

T&T has developed expertise in the application of numerical modelling techniques to:

- Landslide assessment and stabilisation
- Embankment shear keys and piles
- Retaining walls, bridge abutments, and MSE walls
- Deep excavations and effects on adjacent structures
- Tunnels
- Quay walls

- Earth dams
- Seismic behaviour and liquefaction
- Staged excavation and construction works
- Settlement and consolidation.

Our expertise includes the practical application of these technologies to ensure they are applied to greatest effect. Our team has experience with the leading geotechnical numerical modelling packages, including FLAC, Plaxis, Sigma/W and Phase2, and we have developed an extensive in-house library of customisations which increase the efficiency of the modelling process and allow assessment of a range of specialised issues.

We operate all of these packages on a regular basis and select the most appropriate method for your project.

Regardless of the sophistication of the techniques used, analysis has little value if the results are not clearly communicated. T&T has developed a range of presentation formats to convey critical information to various parties, such as clients, structural engineers, consent authorities and peer reviewers.



**ENVIRONMENTAL AND ENGINEERING CONSULTANTS**