

Geotechnical Capability Statement 2026

Practical geotechnical solutions for complex and disturbed ground conditions.

Why Trilogy Consulting

- Specialists in complex and disturbed ground conditions
- Integrated geotechnical and contaminated land expertise
- Senior technical involvement across investigations and design
- Practical investigation strategies that reduce program and redesign risk
- Strong experience across infrastructure, renewable energy and brownfield redevelopment

Who We Are

Trilogy Consulting specialises in understanding ground conditions and transforming complex or disturbed sites into practical development outcomes. By integrating geotechnical and environmental insight, we help clients manage ground risk and deliver efficient and sustainable projects.

Collaborative & Client-Centric

Trilogy Consulting delivers results through collaboration, integrity, and personalised service. As a local consultancy, we combine agile delivery with specialist expertise and a strong industry network to provide practical, technically sound solutions.

Practical, Sustainable, & Tailored

We deliver practical and sustainable solutions through strong partnerships and focused effort. Detailed ground investigation and technical due diligence underpin our approach, providing clients with the clarity needed to manage ground risk and deliver complex projects.

Our Core Services

- Geotechnical risk assessment and due diligence
- Site investigations and ground characterisation
- Use of advanced and targeted investigation techniques
- Digital field data capture and integrated geotechnical datasets (captured once and used consistently)
- Foundation design and assessment
- Settlement analysis and performance evaluation
- Slope stability and numerical modelling (limit equilibrium and finite element methods)
- Collaboration with project stakeholders to develop practical and constructible solutions



We are proudly South Australian owned and operated.

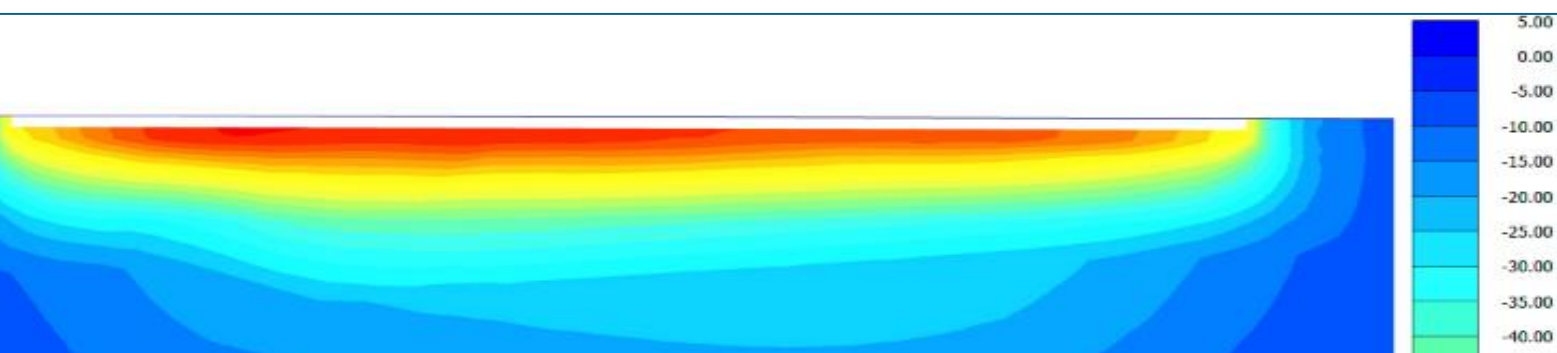


Our Key Geotechnical Capabilities

Service Area	Key Activities	Project Outcomes
Engineering Geomorphology	Interpret landform evolution, historical landscape modification and geomorphic processes using aerial imagery, historical mapping and geological data. Identify features such as former clay pits, quarries, drainage alterations and areas of historical filling that may influence subsurface conditions.	Improved understanding of legacy ground disturbance and landform evolution, enabling investigation programs to target areas of greatest geotechnical uncertainty.
Desktop Study & Geotechnical Risk Assessment	Assess ground-related development constraints by reviewing geological setting, historical land use and ground variability. Identify geotechnical hazards and project risks.	Early identification of ground constraints and improved planning of investigation and design.
Geotechnical Site Investigations	Plan and supervise targeted intrusive investigations including boreholes, test pits, CPT and variable energy DCP testing. Coordinate in-situ testing and laboratory analysis to support interpretation of subsurface conditions.	Development of reliable ground models and engineering parameters to support design and reduce construction uncertainty.
Foundation Design	Assess site-specific ground conditions, structural loading and settlement tolerance. Develop shallow and deep foundation options with consideration of constructability and environmental constraints where applicable.	Practical and buildable foundation solutions tailored to site conditions and project requirements.
Settlement Analysis	Evaluate settlement behaviour of foundations, slabs and embankments using engineering assessment and finite element modelling (e.g. PLAXIS).	Prediction and management of total and differential settlement to support long-term asset performance.
Geotechnical Modelling and Analysis	Undertake slope stability assessment and numerical modelling using limit equilibrium and finite element methods (e.g. PLAXIS, Slope/W).	Improved understanding of ground behaviour to inform robust design solutions.
Project Integration and Collaboration	Collaborate with civil, structural, environmental and construction teams throughout investigation, design and delivery phases.	Integrated project outcomes and efficient delivery of geotechnical solutions, reducing the risk of redesign, inappropriate solutions and additional project expenditure.

Digital Modelling and Integrated Workflows

- Investigation data captured digitally can be rapidly incorporated into ground models and numerical analyses.
- Subsurface data can be rapidly incorporated into PLAXIS 3D models to evaluate settlement, staged construction and ground behaviour.
- Modelling outputs can be readily integrated with GIS and CAD platforms to support clear interpretation and design communication.



Sustainable Ground Solutions

We specialise in transforming challenging ground conditions into practical and sustainable engineering solutions. By carefully considering geotechnical constraints, project requirements and construction methods, we help clients manage ground risk while delivering efficient and resilient project outcomes.

Case Study – Former Brompton Gasworks

During early investigation works, initial subsurface data indicated ground conditions poorer than anticipated. Conventional investigation approaches would likely have required additional intrusive works and design reassessment at a later stage, potentially delaying the project while foundation options were reconsidered.

Our Approach

Rather than proceeding with a limited dataset, the investigation strategy was adapted in real time to incorporate targeted high-resolution ground investigation techniques. This allowed the subsurface conditions to be characterised more reliably during the field program.

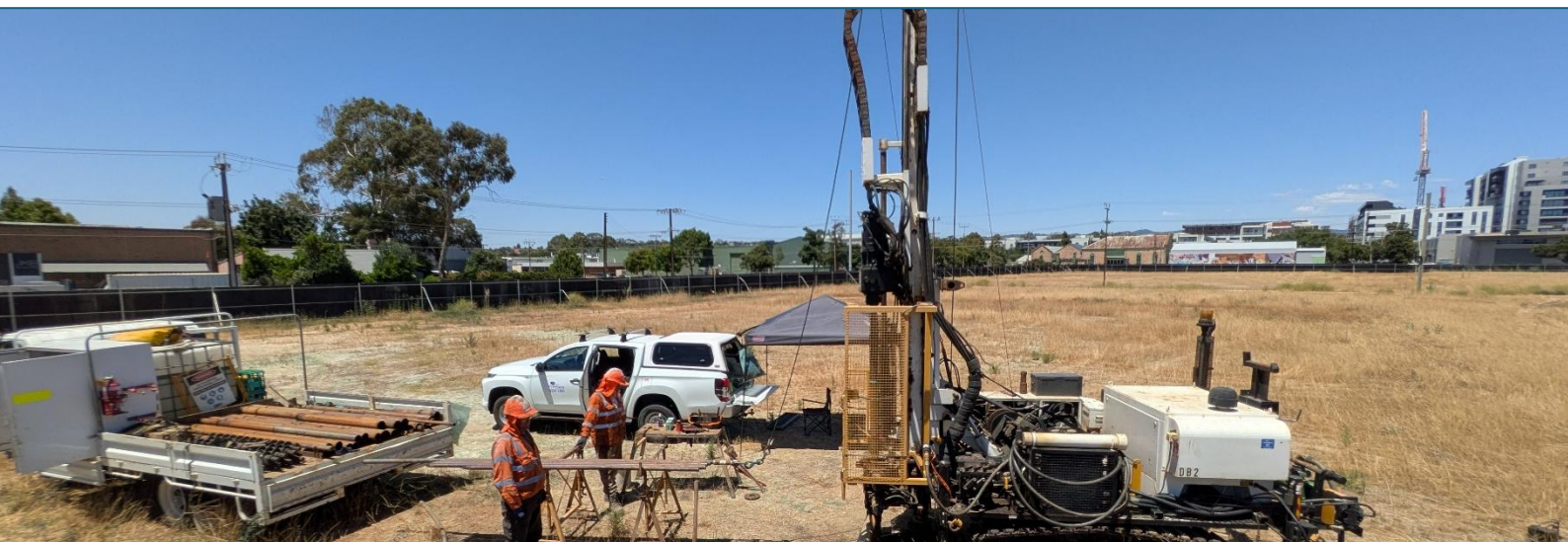
Our team interpreted the incoming data as it was obtained and worked closely with the project team to reassess feasible foundation solutions based on the improved understanding of ground conditions.

The Outcome

By refining the investigation approach during the field program, a more appropriate foundation solution was identified without the need for additional investigation phases months later. This enabled the design team to progress with greater confidence, reducing program risk and allowing practical foundation alternatives to be considered earlier in the project lifecycle.

Key Benefit

A responsive investigation strategy and real-time geotechnical interpretation can significantly improve decision-making, enabling projects to adapt quickly to ground conditions while avoiding delays associated with staged investigation and redesign.



Case Study – Thebarton

A detailed desktop review identified that the site was historically partially occupied by a clay pit associated with former industrial land use. The pit was then subsequently backfilled to ground level (creating a pughole – local term). The feature had not been clearly identified or delineated during previous phases of investigation. As a result, there was a risk that concept foundation solutions could be developed without fully understanding the extent and characteristics of the disturbed ground.

Our Approach

The investigation strategy was adjusted to specifically target the suspected pughole area. Additional ground investigation techniques were undertaken to establish the depth, composition and lateral extent of the materials.

The incoming field data was interpreted progressively during the investigation program, allowing the ground model to be refined in real time and communicated to the project team as understanding of the feature improved.

The Outcome

The investigation successfully delineated the geometry and material characteristics of the pughole. This allowed the design team to adapt the concept design early in the project, focusing on foundation solutions that were compatible with the identified ground conditions.

By clarifying the extent of the disturbed ground at an early stage, the project avoided progressing design options that may have proved impractical or disproportionately expensive once the ground conditions became better understood.

Key Benefit

Early identification and delineation of legacy ground disturbance allowed design teams to respond at concept stage, reducing the risk of redesign, unnecessary investigation phases, and foundation solutions that are not aligned with actual site conditions.

