Dr Martin D Larisch
CPeng MIEAust, RPEQ

ML Engineering
GEO*practical* Consulting

Independent expert for **forensic investigations** and **remediation work** on **piling, basements and deep foundations**

Bored Piles / Drilled Shafts

Driven Piles

Retention systems

Basements

Ground Anchors

Hard Rock Drilling

Ground Improvement

Concrete Technology

Drilling Support Fluids

Background
Dr Martin Larisch is a piling and geotechnical professional with over 15 years of international experience in the piling and deep foundation industry. He graduated from the University of Applied Science in Hildesheim (Germany) with a degree in Civil Engineering and obtained his PhD in Geomechanics at The University of Queensland in Brisbane.

He is a CPEng with Engineers Australia, a Registered Professional Engineer in Queensland, an Associate Member of CIRCEA and was appointed as an Adjunct A/Professor at The University of Queensland. He has authored a book chapter and numerous technical papers and has volunteered in various industry committees to improve best practice in pile design and construction.

Industry experience
Over the past decade Martin has held senior technical and operational positions in major piling companies in Australia, New Zealand and Germany providing technical leadership on both, national and global levels. He was responsible for the delivery of some of the largest piling and deep foundation projects in Australia and New Zealand, which included bentonite supported bored piles of up to 2.2m in diameter and 50m depth.

Besides his expertise in the design and construction of large diameter bored piles, Martin was also involved in numerous forensic investigations and the subsequent remediation works of faulty bored piles, diaphragm walls and other deep foundations like ground improvement works.

Presently, Martin is providing technical input and advice for various major piling and deep foundation projects and tenders in Auckland, which includes but is not limited to the design and construction of large diameter bored piles and diaphragm walls constructed under drilling support fluids (e.g. Commercial Bay Precinct in Auckland).

Expert consultant for piling & deep foundations
Since November 2014 Dr Martin Larisch has been working as the Principal of his own independent geotechnical consultancy based in Brisbane offering independent expert advice, forensic investigations, advanced design services, construction method reviews and advice on concrete technology for various clients across Australia and Asia Pacific.

As an Adjunct A/Professor at The University of Queensland he has been initiating and supervising several research projects in the areas of concrete technology and drilling fluids for deep foundations.

Academic Background
2001 University Degree (Dipl-Ing) in Civil Engineering, University of Hildesheim (Germany)
2013 Graduate Certificate in Risk Management, Swinburne University, Melbourne (Australia)
2014 PhD – Geotechnical Engineering Centre, University of Queensland, Brisbane (Australia)

Professional Qualifications & Affiliations
- CPEng MIEAust - Chartered Professional Engineer, Institution of Engineers Australia
- Registered Professional Engineer (RPEQ), Queensland, Australia
- A/Member - College of Investigative & Remedial Consulting Engineers of Australia (CIRCEA)
- Member of the Australian Geomechanics Society (AGS)

Selected reference projects (Design & Delivery):

Commercial Bay Precinct, Auckland, New Zealand

- 2016 - Geotechnical Engineering Manager
- Technical input to optimize the design and construction of the bored piles and the basement retention system for a 38 storey building (bored piles, diaphragm walls, sheet piles, anchors)
- Contract value: NZ$14.5M
- Quantities: Diaphragm wall: 7,500m^2, Anchors: 262 No. (L=20m)
  Bored piles: 48 piles, L=20-25m, ∅2100- 2400mm (casing supported)

Banora Point Upgrade Project, NSW Australia

- 2011 - Sub Alliance Manager (Piling) - Sub alliance tendering, negotiation & execution process, construction and project management. Successful implementation of cluster drill technology on this project to penetrate extremely high strength rock (basalt)
- System: Large diameter bored piles installed under bentonite (40%) and the use of cluster hammers (60%) to penetrate extremely high strength rock
- Contract value: $15.2M (Sub Alliance)
- Quantities: Bored piles: 225 piles, L=15-55m, ∅1200mm (40% bentonite supported)

SOUL Apartment Building, Surfers Paradise, QLD, Australia

- 2008 - Project Management, pile design and certification (D&C project)
- Foundation piles for the 78 storey apartment building and the surrounding retail area
- Systems: Large diameter bored piles under bentonite (tower piles) using high strength concrete (85 MPa); CFA piles to support the 5 storey retail area
- Contract value: $6.5M
- Quantities: Bored piles: 44 piles, L=40-50m, ∅1500- 2200mm (bentonite supported)
  CFA piles: 260 piles,L=8-22m, ⌀600mm & 900mm

Selected reference projects (Forensic Investigation & Remediation):

Bridge Foundation, Toowoomba, QLD, Australia

- 2015 – Forensic expert / reviewer
- Review and comment on the ongoing investigation of a defect bored pile foundation for a bridge abutment as the concrete at the pile base was unsatisfactory and the pile shaft integrity was seriously compromised by ‘soft’ areas and inclusions. Issues in relation to insufficient pile construction methods were confirmed during the review as the root cause of the defects
- Contract value: $1.5M
- Quantities: Bored piles: 19 piles, L=25m, ∅900mm (casing supported)

Hexham Rail Facility, Newcastle, NSW, Australia

- 2014 - Technical Manager
- Leading the internal investigation about faulty bored piles, constructed under polymer drilling fluid in very soft soil formations including the successful remediation and adjustment of construction methods and materials
- Contract value: $3.5M
- Quantities: Bored piles: 78 piles, L=35m, ∅1200mm (polymer supported)

Industry research & innovations (selected examples)

- First use of 'third generation' polymer drilling fluids for bored piles in very soft clay in Australia to replace traditional bentonite mineral drilling fluids (Newcastle, NSW 2014)
- Implementation of cluster drilling hard rock drilling techniques for bored piles (∅1200mm) to penetrate basalt with UCS up to 400 MPa (Banora Point, NSW 2011)
- Use of high strength (85 MPa), super-workable concrete for large diameter bored piles of up to ∅2200mm and 50m depth for a 78 storey high rise building (Surfers Paradise, QLD 2008). *Nomination for the Engineers Australia QLD Excellence Awards for Innovations in 2009*

Academic research (selected example)

- Behaviour of bentonite and polymer based drilling fluids (Brisbane, QLD, 2015/16, ongoing)

Selected publications:

Journal Papers (peer reviewed)

- Larisch, M, Poskitt, N, Netterville, H and Dredge, S 2013, 'Advanced QA for piling works for the WICET project in Gladstone', *AGS journal, Vol 48 No 3 September 2013, pp. 99-112*
- Larisch, M 2009, 'High tension load transfer using bored piles for SOUL Apartments, Surfers Paradise', *AGS journal, Volume 44, No 1 March 2009, pp. 1-10*

Conference Papers (peer reviewed)

- *Larisch, M 2016, 'Bored pile performance as a direct result of construction methods and associated installation effects', 5th International Conference on Forensic Geotechnical Engineering, December 2016, Bangalore, India, accepted for publication*
- Larisch, MD, Williams, DJ and Scheuermann, A 2015, 'Influence of pile installation techniques on heave volumes in clays', *12th Australia New Zealand Conference on Geomechanics, February 2015, Wellington, New Zealand, pp. 143-150*
- Larisch, M and Gates, S 2013, 'Construction methods for rigid and flexible retaining walls', *Proceedings of the 2013 AGS Symposium Retaining Structures: Recent Advances and Past Experiences, Sydney, November 2013, pp. 57-66*
- Larisch, M 2012, 'Comparison of different hard rock drilling methods for bored piles', *16th Australian Geomechanics Symposium, Advances in Geotechnics of Roads and Railways, Sydney, October 2012, pp. 197-204*
- Larisch, M 2011, 'Experience with high strength concrete for the foundation of a high rise building', *9th Symposium on High Performance Concrete, August 2011, Roturoa, New Zealand, pp. 580-587*

Book Chapters (peer reviewed)

- Larisch, MD, Kelly, R and Muttuvel, T 2015, Chapter 21: Improvement of soft soil formations by drilled displacement columns, In: *Ground Improvement: Case Histories, pp. 573-622, Elsevier (Oxford), by Indraratna, Chu and Rujikiatkamjorn.* ***(Invited)***.

Standards / Technical Guideline Publications

- 'Tremie Concrete for Deep Foundation', Recommended Practice booklet published by the Concrete Institute of Australia in September 2012 (Co-author and co-initiator)