MALREN GEO
FOR SATISFACTORY GEO-SERVICES

MalRen Geo (Pty) Ltd.
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Geotechnical Engineering Services

Geotechnical Investigations

- ❖ **Detailed evaluation and enhancement of knowledge on geological, structural, and hydrogeological issues of areas.**
- ➢ **<u>This includes (but not limited to)</u>:**
- Geotechnical Engineering desktop studies (literature review, data reconnaissance, etc.).
- Planning and designing of investigation programmes (i.e. investigation proposal, method statement, as well as pricing and cost estimates).
- Excavation of test pits and auger trial holes (i.e. positioning of pits/holes, excavation methods, as well contracting and managing of excavation contractors).
- Soil profiling and investigation (i.e. application of the MCCSSO recommended standard procedures).
- Development, planning and implementation of dynamic geotechnical drilling programmes (including budgeting, drilling method (Rotary Core and Percussion drilling), drilled hole collar and positioning, as well as contracting and management of drilling personnel).
- In-situ field testing (e.g. standard penetration tests (SPT), cone penetration tests (CPTu), plate load testing, etc.).
- Implementation of geological, structural and geotechnical logging with the aid of uniform project-specific logging procedures that are in compliance with associated logging principles.
- Dynamic and interactive 3D geological/structural/geotechnical modelling.
- Evaluation of geological hazard, geotechnical risk, and terrain stability.
- Reporting and documentation of geotechnical data.

Dolomite Stability Investigations

- ❖ **Detailed evaluation and enhancement of knowledge on subsurface dolomitic areas in attempt to make appropriate recommendations and precautionary measures prior to infrastructure construction works and land usage.**
- ➢ **<u>This includes (but not limited to)</u>:**
- Detailed desktop studies (i.e. literature review, data reconnaissance, etc.).
- Assessment and evaluation of the geology and geomorphological features (including any previous sinkhole or subsidence occurrences).
- Reconnaissance of hydrogeological data (i.e. presence of groundwater compartments, Quaternary catchment number, original groundwater levels, occurrence/planned dewatering activities, groundwater monitoring activities, etc.).
- Geophysical surveys (e.g. gravity surveys and maps, electromagnetic resistivity, seismic surveys, remote sensing GIS techniques, etc.).
- Excavation of test pits or exploratory trenches for near-surface investigations (i.e. positioning of pits/trenches, excavation methods, as well contracting and managing of excavation contractors).
- Development, planning and implementation of dynamic geotechnical drilling programmes (including budgeting, drilling method (typically Percussion drilling), drilled hole collar and positioning, as well as contracting and management of drilling personnel).

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- Implementation of geological, structural and geotechnical logging with the aid of uniform project-specific logging procedures that are in compliance with associated logging principles.
- Hydrogeological applications (i.e. see section 4.3.2.)
- Associated Geotechnical Investigations (see section 4.2.1.)
- Dynamic and interactive 3D geotechnical modelling.
- Evaluation of geological hazard, geotechnical risk, and terrain stability pertaining to dolomitic areas (i.e. inherent hazard classification of the dolomite site).
- Reporting and documentation of the data in accordance with SANS 1936:2012 and the latest NHBRC manual.

Sampling Strategies, QA/QC Procedures and Laboratory Testing and Analysis.

❖ **Essential for the increase in the accuracy and overall level of confidence in the geotechnical data.**

➢ **<u>This includes</u>:**

- Development and planning of geotechnical engineering sampling programmes.
- Application of uniform and project-specific sampling methods and collection procedures for laboratory testing (i.e. rock and soil sampling).
- Development and application of QA/QC procedures (i.e. monitoring sample for collection, storage, recovery, preparation, and analysis at working sites).
- Laboratory testing and analysis of samples (i.e. including contracting of commercial laboratories).
- Capturing of sampling data in an interactive database system.

Database Setup and Management

❖ **A system that ensures accurate and uniform data capturing, validation, integration and management across a wide range of geotechnical engineering sub-services and various MalRen Geo Divisions.**

➢ **<u>This includes</u>:**

- Setup and management of a customised geotechnical engineering database system.
- On-site or office-based data collection and capturing.
- Integrated information systems and their management.
- Data validation and application of QA/QC procedures.

Project Audit and Evaluation

❖ **Due diligence investigations – Overall verification and validation of the quality of the geotechnical engineering data and any associated project risks.**

➢ **<u>This includes</u>:**

- Application of due diligence studies of geotechnical engineering projects.
- Overall project risk assessments and potential opportunities.
- Contracting of Competent and Qualified Persons for verification and validation.