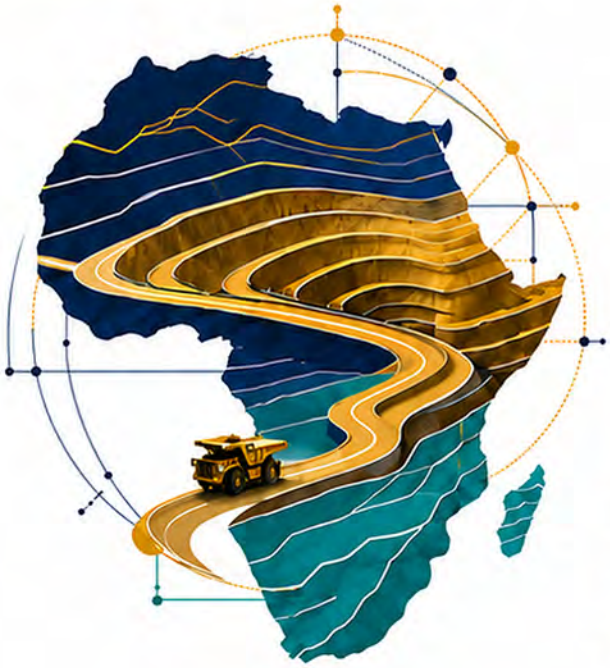
COMPANY PROFILE

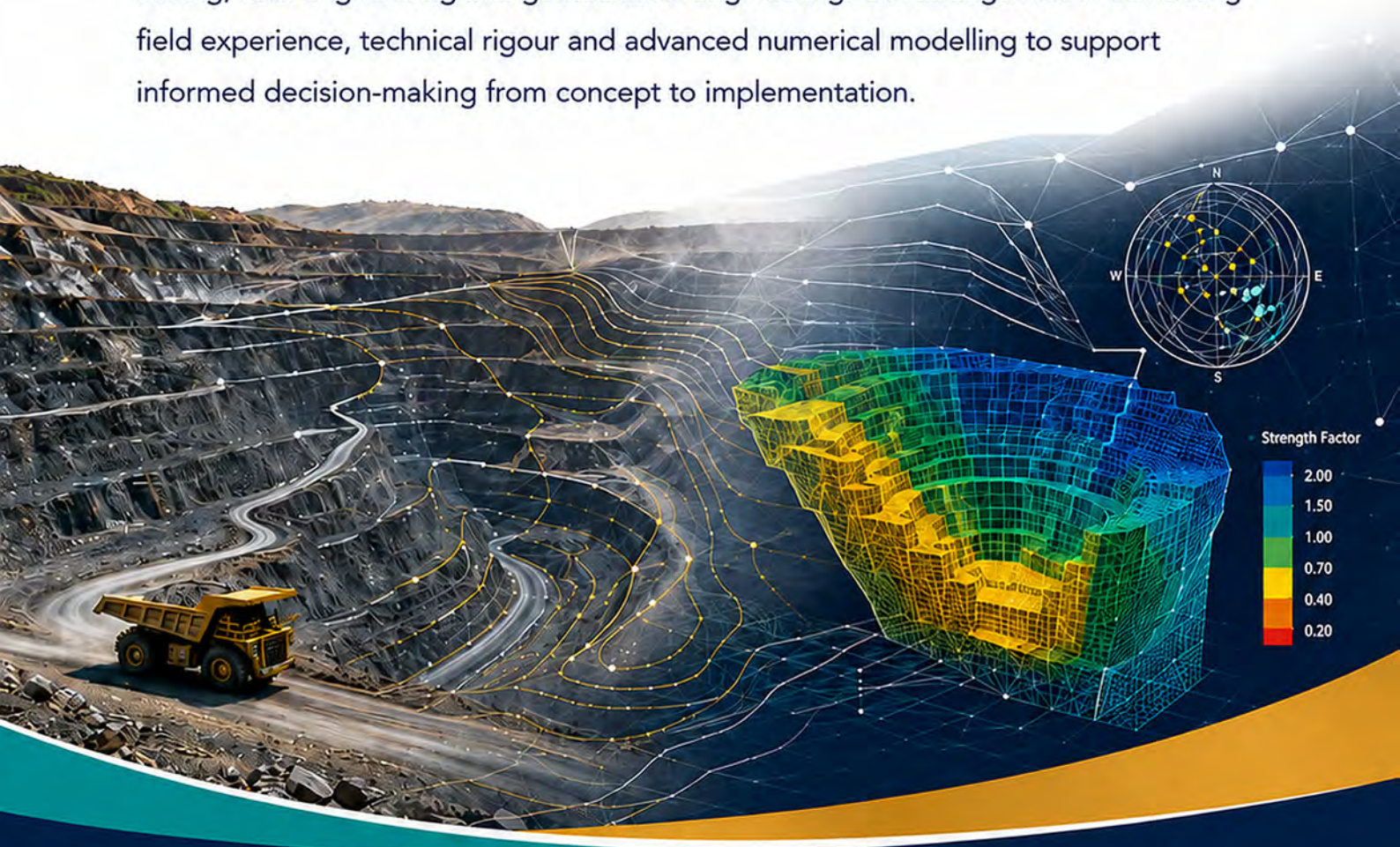


MLB CONSULTING

Mining Consulting | Rock Engineering | Geotechnical Engineering

Specialist technical consulting for the African extractive industry

MLB Consuliting provides practical, cost-effective and sustainable solutions across mining, rock engineering and geotechnical engineering. Our strength lies in combining field experience, technical rigour and advanced numerical modelling to support informed decision-making from concept to implementation.



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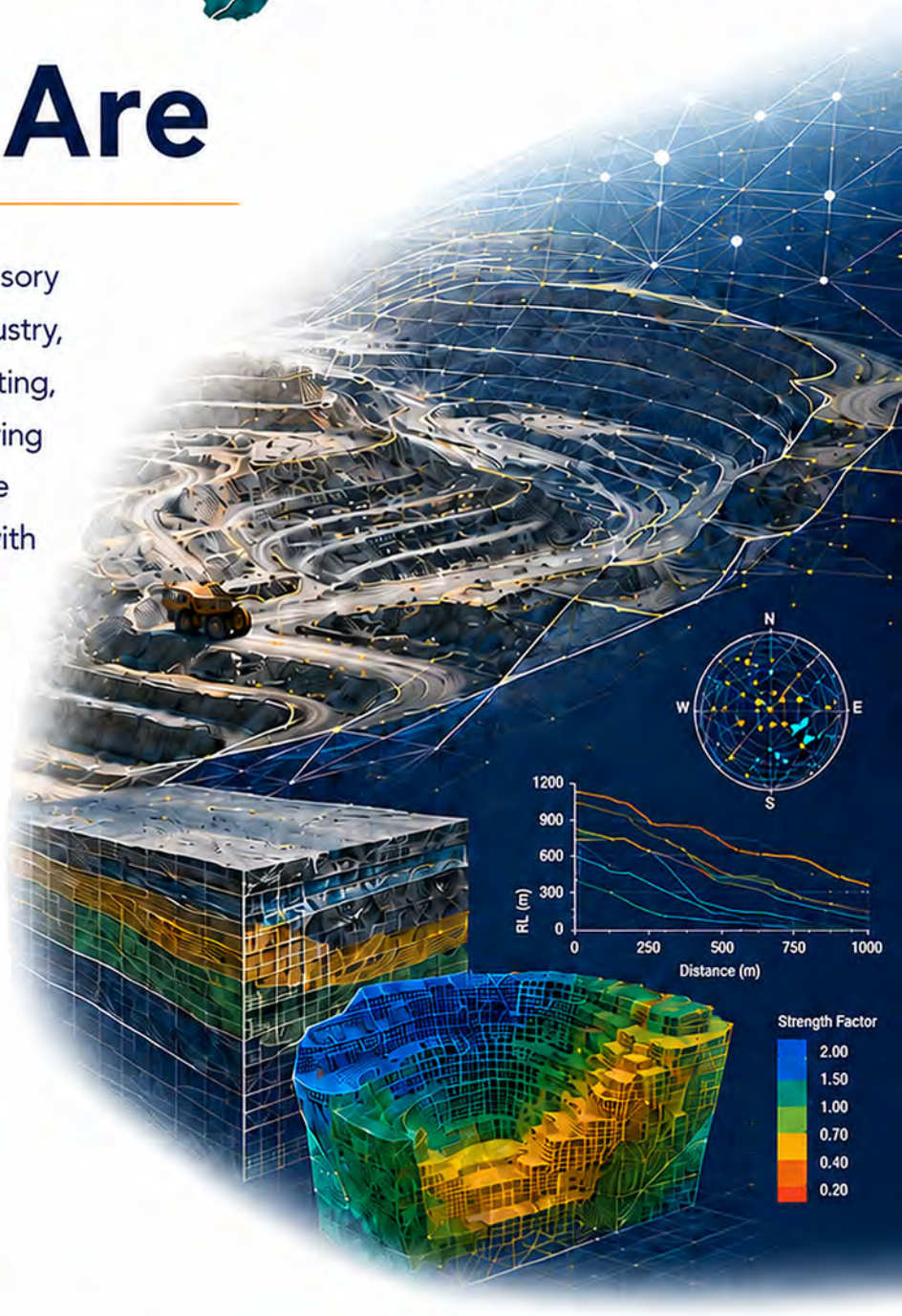
Who We Are

MLB Consulting provides specialist advisory and technical support to the mining industry, with capabilities spanning mining consulting, rock engineering, geotechnical engineering and advanced numerical modelling. We combine practical field understanding with rigorous engineering analysis to deliver solutions that are technically sound, cost-effective and implementation focused.



Our Approach

Technical rigour – evidence-based analysis supported by engineering judgement.

Practical delivery – solutions tailored to operational realities and project constraints.

Integrated insight – linking field data, modelling and design recommendations.

From concept to implementation

We support projects from early study phases through design, review, optimisation and implementation, helping clients make better decisions with confidence.

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Services at a Glance

MLB Consulting provides integrated technical support across the mining value chain, from field data collection and analysis to design, modelling and implementation support.

01 Remote Exploration Services

- Geophysics
- Drilling
- Core logging
- Sampling
- Field mapping
- Data collection and database management

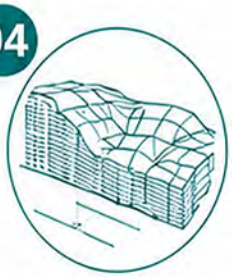
02 Data Analysis

- Geostatistics
- Geological / Geotechnical modelling
- Geophysical interpretation and modelling
- Resource modelling
- Slope stability analysis and support requirements
- QAQC and geochemical reviews

03 Mining / Mine Development

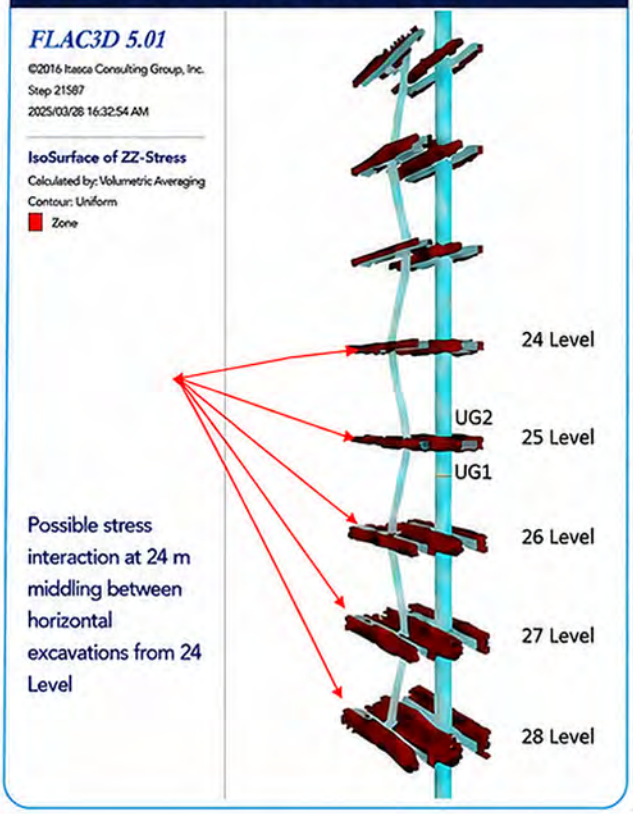
- Mine design and scheduling
- Long, medium and short term planning
- Ventilation design and simulation
- Infrastructure planning
- Mine optimisation studies
- Due diligence and compliance support

04 Numerical Modelling



- Slope stability
- Underground excavation response
- Support interaction
- Geotechnical risk assessment
- Scenario testing
- Decision support

NUMERICAL MODELLING EXAMPLE



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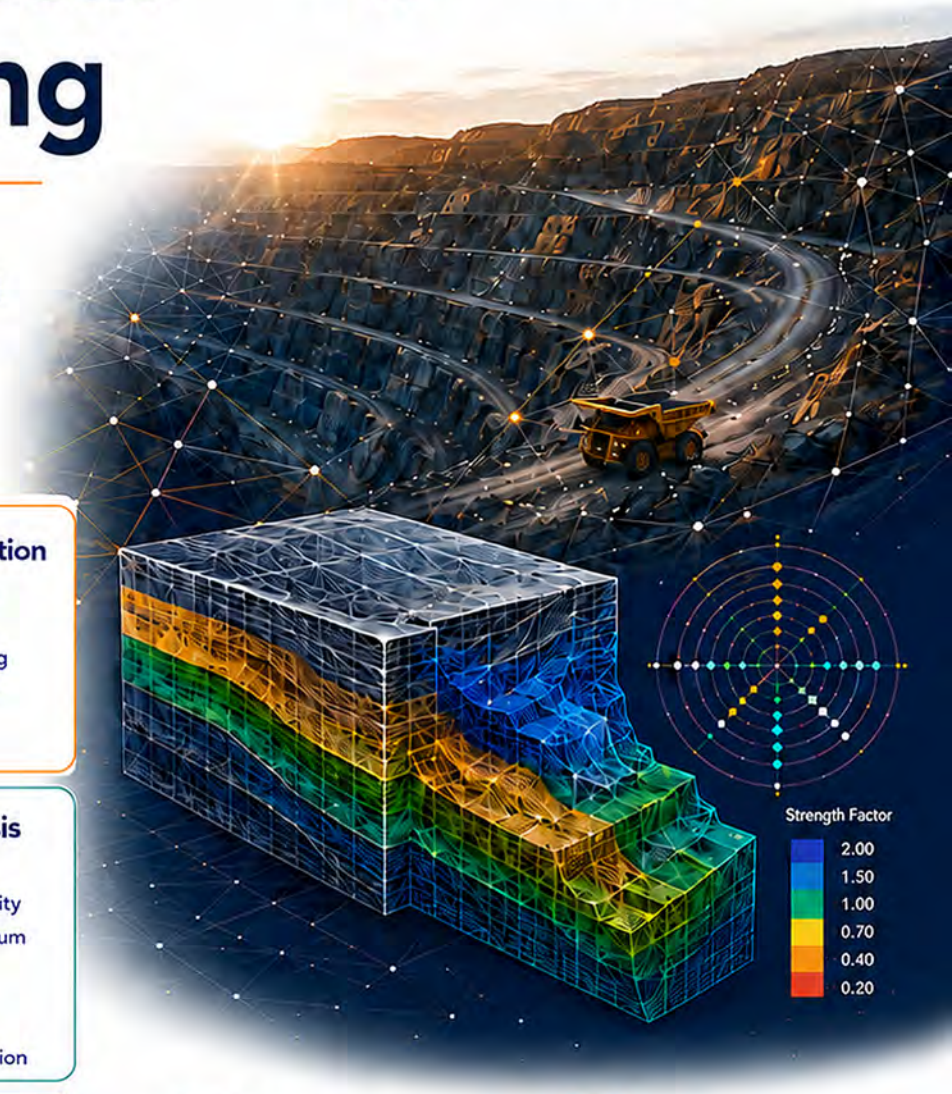
Geotechnical Engineering

MLB Consulting provides geotechnical engineering expertise that ensures ground stability, infrastructure integrity and safe, efficient mining operations across all project stages.



01 Geotechnical Investigation

- Field mapping and logging
- Drilling and sampling
- In-situ and laboratory testing
- Geotechnical interpretation
- Site characterisation

02 Slope Stability Analysis

- Open pit slope design
- Inter-ramp and overall stability
- Kinematic and limit equilibrium analysis
- Probabilistic and sensitivity analysis
- Risk assessment and mitigation

03 Underground Geotechnics

- Ground support design
- Excavation stability assessment
- Stress analysis and numerical modelling
- Geotechnical risk management
- Instrumentation and monitoring design

04 Infrastructure Geotechnics

- Tailings storage facilities
- Waste dump design and stability
- Heap leach pad design
- Roads and foundation engineering
- Settlement and deformation analysis

Advanced Modelling

Numerical modelling for complex geotechnical conditions and design optimisation.

Risk Management

Identify, assess and mitigate geotechnical risks to improve safety and reduce project uncertainty.

Practical Solutions

Solutions tailored to site conditions, operational needs and project objectives.

Integrated Approach

Close collaboration across disciplines to deliver reliable and cost-effective outcomes.

Safe ground. Strong foundations. Sustainable operations.

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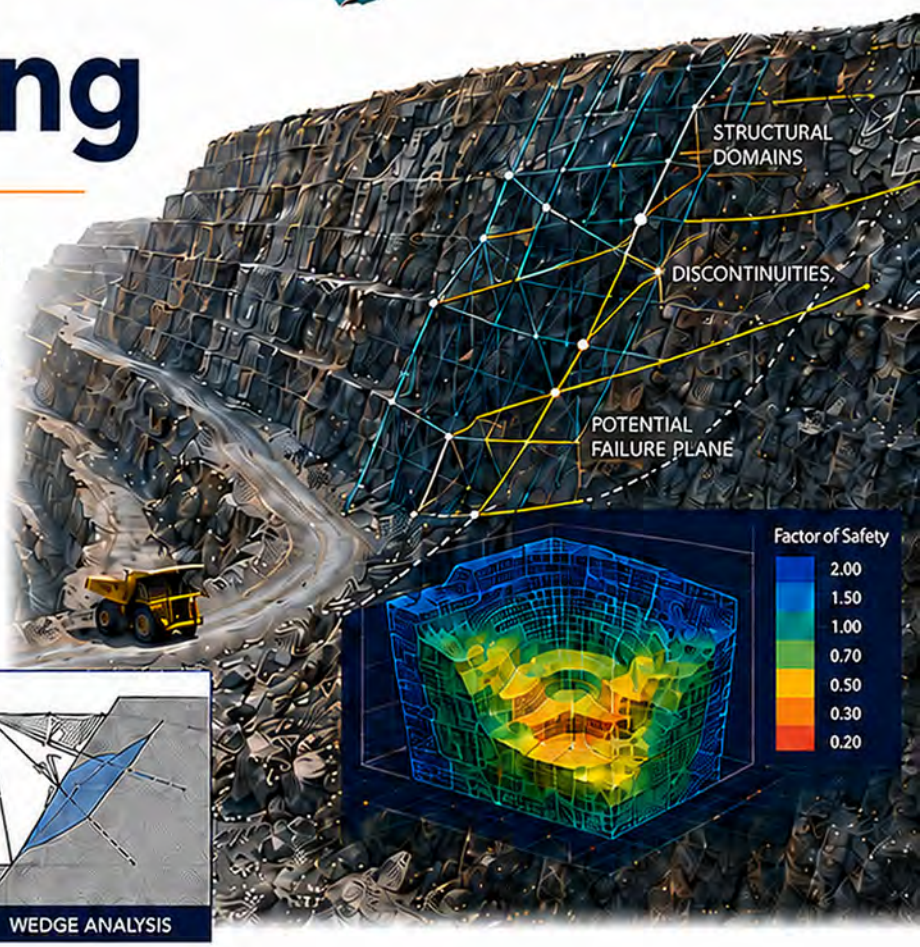
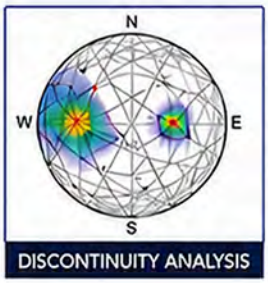
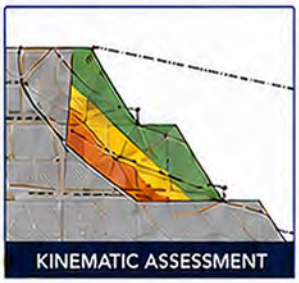
Rock Engineering

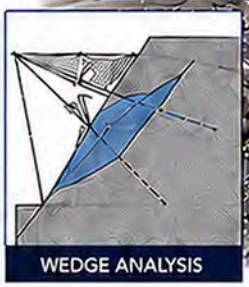
MLB Consulting provides rock engineering input that supports safe, practical and cost-effective mining decisions. We combine sound geotechnical principles, advanced analysis and real-world field understanding to manage risks, optimise designs and improve operational outcomes across open pit and underground environments.





DISCONTINUITY ANALYSIS


KINEMATIC ASSESSMENT


WEDGE ANALYSIS

Slope Stability

- Stability assessments for pits, walls and highwalls
- Support requirements and reinforcement strategies
- Monitoring solutions for informed decision-making

Underground Rock Engineering

- Excavation stability and stand-up time assessments
- Support recommendations and design input
- Ground hazard identification and risk review

Design Review

- Geotechnical acceptance criteria
- Design checks and peer review
- Risk-based recommendations and improvements

Monitoring & Response

- Performance monitoring and data review
- Observational input and trend interpretation
- Practical response strategies and action plans

Engineering judgement supported by analysis and field understanding.

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Numerical Modelling & Simulation

MLB Consulting leverages advanced numerical modelling and simulation to understand complex rock mass behaviour, evaluate risks and optimise designs. Our models integrate geology, geomechanics and operational inputs to deliver robust, evidence-based solutions that support safe, efficient and sustainable mining.

Applications

- Slope stability analysis
- Underground excavation behaviour
- Rock support assessment
- Ground response forecasting
- Mine layout optimisation

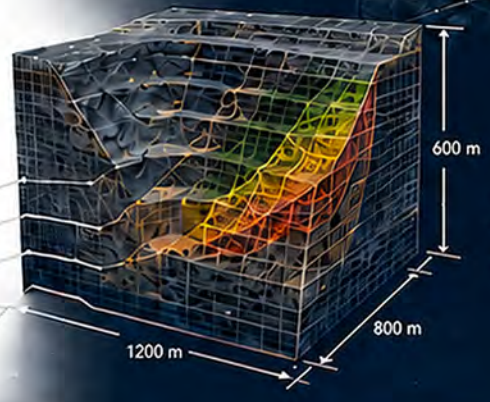
Typical Outputs

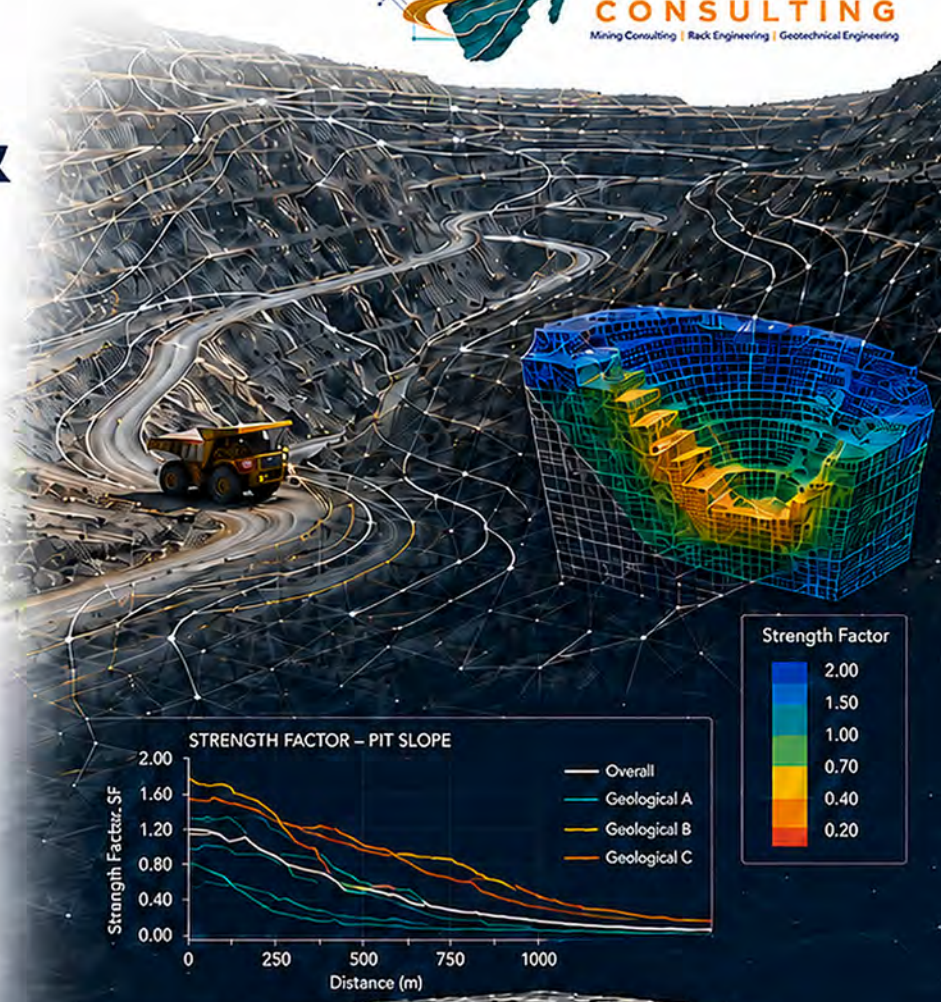
- Displacement contours
- Strength factor plots
- Sensitivity studies
- Design recommendations
- Comparative scenarios

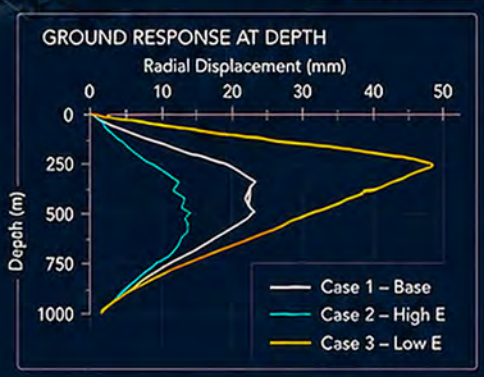
Value to Clients

- Better decisions
- Reduced uncertainty
- Safer designs
- Practical implementation

From conceptual studies to final design and implementation







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Featured Numerical Modelling Projects

Advanced 3DEC and FLAC3D modelling for complex mining environments

MLB Consulting delivers advanced numerical modelling solutions using 3DEC and FLAC3D to understand and manage complex geotechnical conditions in underground and open-pit mining. Our models capture stress redistribution, discontinuity behaviour, excavation interaction and shear strain response.

We translate modelling insight into practical, actionable recommendations that support safer, more efficient and value-driven mine design and decision-making.

MODELLING HIGHLIGHTS

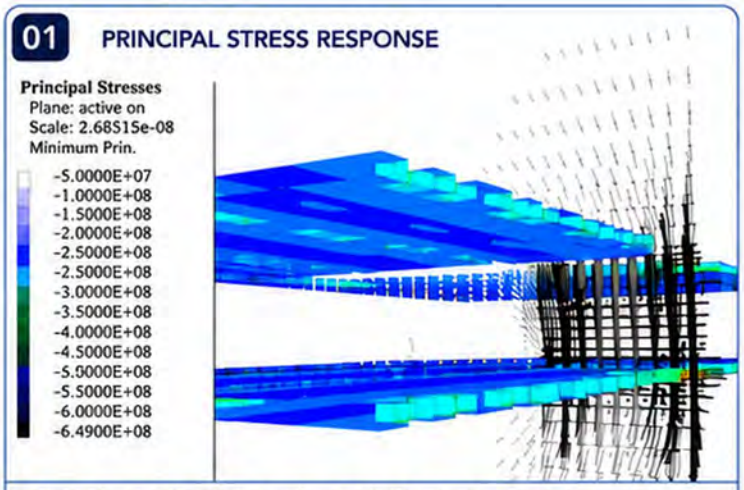
STRESS INTERACTION ASSESSMENT
Quantifies principal stress redistribution around excavations and structural features.

DISCONTINUITY RESPONSE ANALYSIS
Evaluates joint behaviour, normal stress changes and potential breakout zones.

JOINT NORMAL AND SHEAR DISPLACEMENT INTERPRETATION
Interprets displacement and shear vectors to understand movement and deformation along key structures.

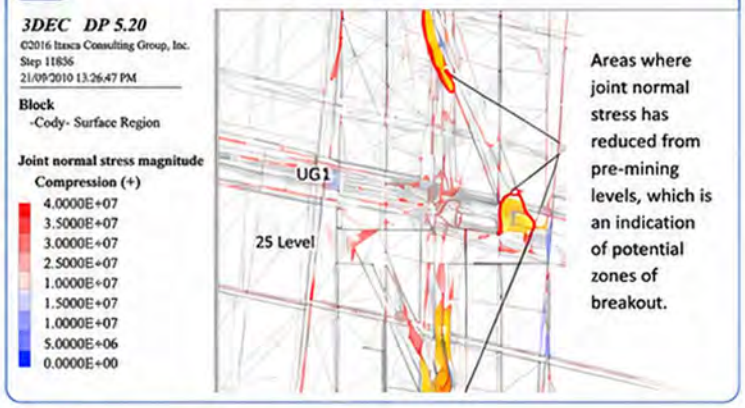
STRAIN-BASED DAMAGE EVALUATION
Identifies shear strain concentrations and potential damage / failure zones for proactive risk management.

01 PRINCIPAL STRESS RESPONSE



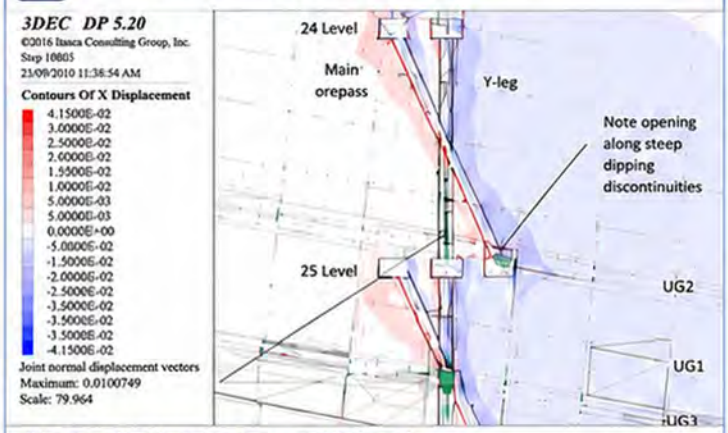
Principal stress distribution and vector field around excavations and structural features.

02 JOINT NORMAL STRESS REDUCTION



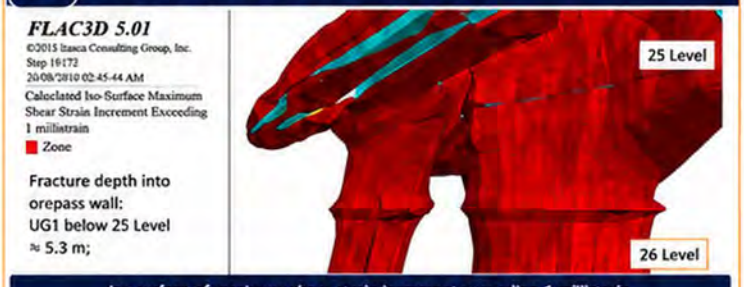
Areas where joint normal stress has reduced from pre-mining levels, which is an indication of potential zones of breakout.

03 DISPLACEMENT AND SHEAR VECTORS



Joint normal displacement vectors and horizontal displacement in the x-direction.

04 SHEAR STRAIN / DAMAGE ZONES



Fracture depth into orepass wall: UG1 below 25 Level ≈ 5.3 m;

Iso-surface of maximum shear strain increment exceeding 1 millistrain

Fracture depth into orepass wall: between 27 and 28 Level ≈ 2.4 m;

Iso-surface of maximum shear strain increment exceeding 1 millistrain

HIGH-VALUE MODELLING INSIGHT FOR DESIGN OPTIMISATION, RISK REDUCTION AND IMPLEMENTATION CONFIDENCE.

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Contact Us

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Get in Touch

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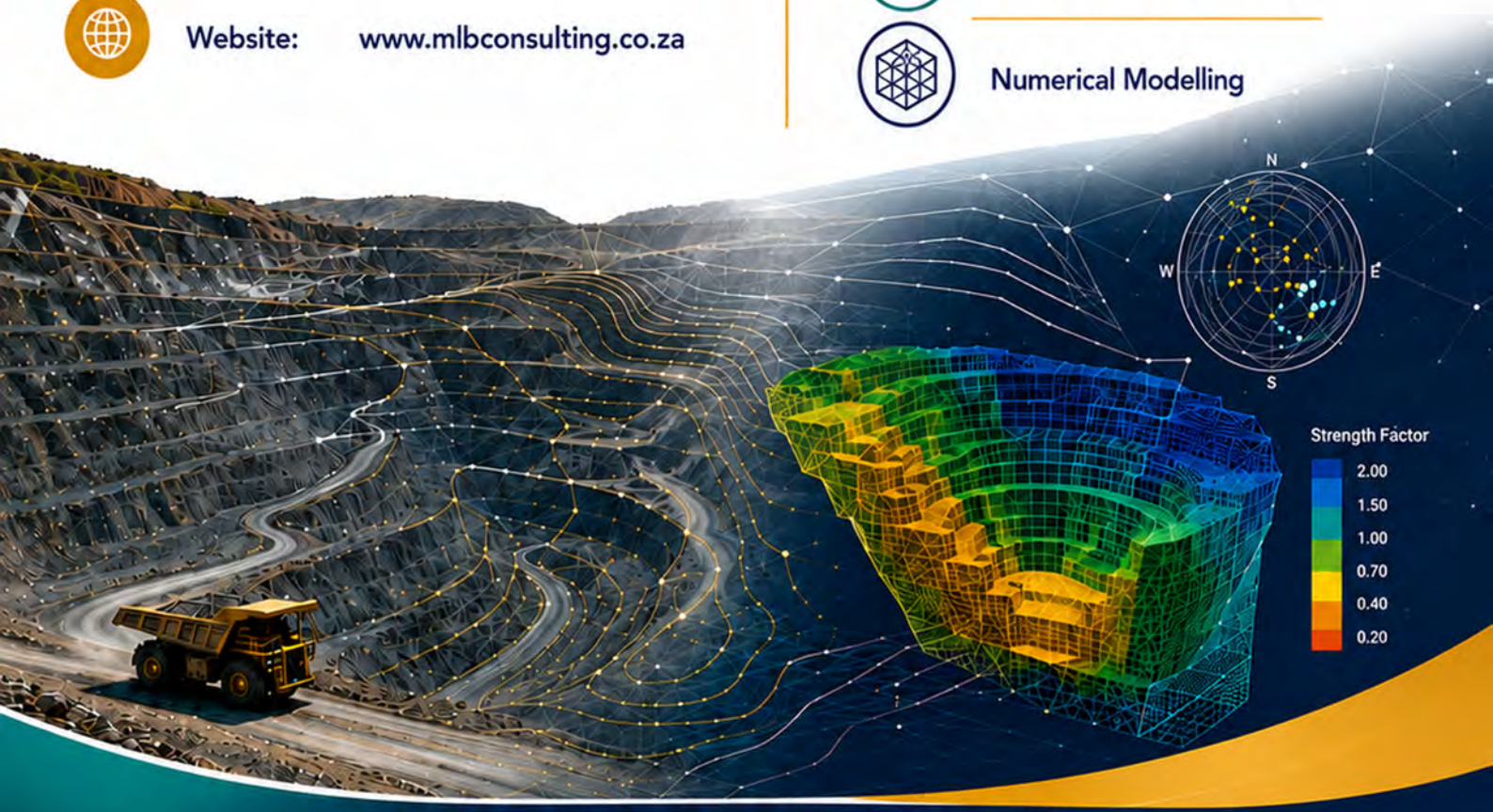
Core Disciplines

- Mining Consulting
- Rock Engineering
- Geotechnical Engineering
- Numerical Modelling



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