



WOUTER HARTMAN

SENIOR GEOTECHNICAL ENGINEER

PERSONAL DETAILS

Date of Birth: 9 March 1968
Nationality: Australian

EDUCATION

University of New South Wales
PhD – Rock Bolting Shear
Behaviour Research – In progress

**University of Pretoria – South
Africa**
Master of Science – Rock Mechanics
Bachelor of Science (Hons) – Strata
Control
Bachelor of Science – Geology

University of Potchefstroom
Master of Business Administration

Chamber of Mines – South Africa
Advance Certificate in Rock
Mechanics
Certificate in Rock Mechanics
Elementary Certificate in Rock
Mechanics

PROFESSIONAL MEMBERSHIPS

Member, Australian Geomechanics Society
Member, Australian Underground Construction &
Tunnelling Association
Member, The Australian Institute of Mining and
Metallurgy
Member, Eastern Australia Ground Control Group
Member, International Society of Rock Mechanics
Member, South African National Institute of Rock
Engineers
Member of the Canadian Institute of Mining &
Metallurgy
Pr. Sci. Nat, Professional Natural Scientist – South
African Council for Natural Scientific Professions

EXPERTISE

- Decline and underground excavation support design (low and high stress environments)
- Ground behaviour observation and in situ monitoring
- Rock testing and characterisation
- Rock reinforcement behaviour
- Research project management
- Stope support design (shallow and deep level)
- Rock mass classification systems
- Seismic monitoring
- Seismic risk analysis and seismic damage interpretation
- Numerical modelling for mine stability assessment
- Sprayed Concrete (shotcrete) application and mix design
- Training – Rock Mechanics and Strata Control training – Students, Mine Management, Shift Supervisors, Geotechnical Personnel

EXPERIENCE

▪ *July 2003 to present*

Senior Geotechnical Engineer - AMC Consultants Pty Ltd

- ***Project Manager*** – Brisbane North/South Tunnel Hydraulic Fracture (HF) stress measurement
- Coal Creek – Risk assessment health and safety aspects with Warren Peck – ***Peer Review***
- Walhalla Ground Control, Assessment of ground control in access development – ***Peer Review***
- ***Project Manager*** - Casallis Gold Mine – Underground and surface geotechnical review for exploration and mining development: Portal stability assessment, adit stability, mining method suitability assessment
- Olympic Dam Operations (ODO) – Shaft pillar design review and design consideration, numerical modelling assessment – ***Geotechnical Team***
- Wonthaggi State Coal Mine – Residential rezoning for total extraction coal longwall panels Risk Management, expansive clay investigation and coal mining subsidence residential zoning ***Peer Review***
- ***Project Manager*** - Costerfield Gold Mine Feasibility Study – Geotechnical advise on underground stope stability, development stability and open pit slope stability
- Pajingo Gold Mine – Ventilation shaft raisebore operation stability analysis and ***Peer Review***

▪ *December 2002 to July 2003*

Senior Geotechnical Engineer, Pajingo Gold Operations – Newmont Australia

- Reporting to Manager Mining pertaining to strategies to combat rock falls and rock related injuries.
- Establishment of a ground control management plan.
- Maintenance and control of geotechnical documentation.
- Raisebore geotechnical analysis Jandam Fresh Air Rise – review of all vent shafts done by raisebore method for evaluation purpose.
- Establishment of standards and procedures pertaining to safety and ground control.
- Establish training manuals for underground operators and ground hazard awareness programs.
- Create and maintain rockfall register and database for statistical analysis.
- Management and design of long hole open stoping operations – pillar design hydraulic radius and stope stability ratio, cable support design and backfill placing.

- Support design of Vera South Deeps and Jandam declines.
 - Slope stability prism monitoring for Vera Open Pit - main access to underground workings.
 - Scott Lode open pit tailings thickener placement - geotechnical risk assessment.
 - Jandam Explosive Magazine - support design and shotcrete application - design of safety bolt application for mono rail system.
 - Incident and serious incident reports.
 - Leading team investigations: - major rockfall in decline near miss, two backfill slump incidents, rockfall in decline access assistant surveyor involvement, stope failure and equipment damage.
 - Participate in CIBETS change management strategies and business processes.
- *November 2000 to December 2002*
- Rock Engineering / Geotechnical Consultant - Civil Tunnelling & Mining**
- Mining Research Centre, The University of New South Wales (2002)
Consulting for the mining industry
 - Geomechanical laboratory tests, analysis and reporting for Newlands Coal Mine.
 - Market survey for innovative bolting technology for Hilti Pty Ltd.
 - Unisearch, The University of New South Wales (2002)
Consulting for the mining industry
 - Geomechanical laboratory tests, analysis and reporting for Douglas and Partners.
 - PPK Consultants
Consulting for civil infrastructure related to mining
 - Peer review of finite element analysis for access tunnel under the Newcastle-Sydney highway.
 - SMEC International (2001-2002)
 - Responsible for geotechnical excavation and support design.
 - Sydney Parramatta Rail Link Twin Tunnels Geotechnical Design – design and review of existing geotechnical information, bolt installation and shotcrete recommendation, rock mass classification, beam stability, geo-hydrology water inflow prediction (Empirical, Mathematical Statistical, Seep-W) drainage design.

- Douglas & Partners (2001)
 - Responsible for geotechnical excavation and support design.
 - Melbourne Eastern Freeway Extension Tender design – geotechnical investigation (Joint Venture: SMEC, Leighton Contractors, EUROCC and Douglas Partners – investigation included support recommendations for twin 4 lane tunnels 18m width 8m high, geo-hydrology analysis (hydraulic conductivity etc.) water inflow predictions, wedge analysis for stability, Shaft stability analysis.
 - Sydney Parramatta Rail Link Station Geotechnical Advice – Review of existing geotechnical information, bolt installation recommendation, rock mass classification, beam stability.

- Connell Wagner (2000-2001)
 - Preliminary geotechnical investigation into ventilation shaft stability and excavation method – Nebo colliery (BHP) - Dendrobium Coal Mine.
 - Soft ground Tunnelling investigation – ore conveyance system and transport of men, material and equipment – Nebo Colliery – (BHP) – Dendrobium Mine.
 - Preliminary geotechnical investigation into portal design and long term stability, Dendrobium Mine.
 - Bondi Rail Link – Turn Backs Extension – Cost estimate of project \$115 m.

■ *May 1999 to November 2000*

Senior Rock Engineer (Projects) - Impala Platinum Mines, South Africa

- Reporting to me: 2 Strata Control Officers, 3 Strata Control Observers.
- Advise management on matters pertaining to Rock Engineering Designs for all mining related projects.
- Provide advice concerning new projects at project management meetings.
- Excavation size designs and medium and long term support capabilities.
- Contractor liaisons with respect to quality monitoring of shotcrete Brandrill & Torrex Joint Venture.
- No. 1-Shaft declines – (Conveyor, Chairlift, Silo's, Dams etc.) Resin grouting & Fibre-reinforced shotcrete.
- No. 10-Shaft Conveyor decline - Mesh & Lace, Shotcrete & 6m Long Anchors.
- No. 11-Shaft Declines - (Conveyor, Chairlift, RAW, Vent Shaft, dams, etc) Galvanized splitsets full column grout and Fibre re-enforced shotcrete.
- No. 14-Shaft - Conveyor, Chairlift, RAW, Vent Shaft, dams, etc)


- Ausiebar and Wet Fibre re-enforced shotcrete.
 - Crocodile River – Barplats - Geotechnical investigations into UG2 reef for bord and pillar design. Geotechnical investigations into slope stability for boxcut – decline entrance.
 - Impala Seismic Network - Implementation of Aura Prisms Mini Seismic Network connecting with Existing 3 Surface Geophones; New Project for the extension of the seismic network with capital application.
 - Accident Inquiry Impala Mine Expert Advise.
- *August 1999 to June 2000*
Act. Rock Engineering Manager - Impala Platinum Mines South Africa
 - Reporting to me: 3 Snr. Rock Engineering Officers, 2 Rock Engineering Officers, 4 Strata Control Officers, 7 Jnr. Strata Control Officers, 18 Strata Control Observers and 5 Learner Strata Control Observers.
 - Managing of the rock engineering function – setting two monthly targets.
 - Check strategies and projects.
 - Taking responsibility of the complete rock engineering function including accident investigation.
 - *January 1997 to April 1999*
Rock Engineering Officer - Impala Platinum Mines, South Africa
 - Reporting to me: 2 Strata Control Officers and two Rock Mechanics Observers.
 - 9 and 10 Shaft Responsibility - approximately 50 000m³ Reef mining.
 - Projects on major declines, incline Shafts, Chair lift, stability analysis.
 - Regional pillar design for the depth range 1000m - 1400m below surface.
 - Major crosscut pillar design for stability purposes including both shaft pillar designs.
 - The No. 9-Shaft - Shaft pillar design had some complications with the second reef (i.e. UG2 reef) situated below the Merensky reef and close to the dams and pump chamber.
 - Advise our best practices on support designs for the codes of practice.
 - Involvement in the finalisation of the mines code of practice on combating rockfall and rockbursts.
 - Fall of ground fatal inquiries.
 - Computer modelling stability analysis done on MINAP 94, MINSIM W, JBLOCK, MAP3D.

- *May 1996 to January 1997*
Acting Rock Mechanics Officer - Vaal Reefs Exploration and Mining Company Limited, Anglo American Corporation (Anglo Gold)
 - Advise management to matters pertaining to rock mechanics at the North Division No. 2-Shaft.
 - 3 Mine Overseer sections.
 - Oversee all off-reef and on-reef development layouts, monthly 1:200 stope sheet audits related to stoping risk
 - Assessment, off-reef and on-reef support recommendations.
 - Meetings with representatives from mining support companies, monthly scrutiny meetings with the assistant mine manager, planning meetings with the relevant production personnel, shaft pillar extraction project team meetings.
 - Support Strategy layouts revision reports, extensive computer modelling for on-reef and off-reef stresses determination, as well as ESS calculations for geological discontinuities with Besol/MS 3-dimensional computer program '95 MINAP '94 2-dimensional computer program both Windows applications.
 - Sub-regular underground visits to assess ground conditions and support quality: shotcrete quality control (normal and re-enforced shotcrete).
 - Extensive experience in concrete technology (Concor technicrete - wall rock support application).

- *March 1994 to April 1996*
Strata Control Officer - Vaal Reefs Exploration and Mining Company Limited, Anglo American Corporation (Anglo Gold)
 - Underground support quality control.
 - Regular visits to stoping operations for support and ground condition assessments.

- *August 1993 to March 1994*
Project Assistant - Vaal Reefs Exploration and Mining Company Limited, Anglo American Corporation (Anglo Gold)
 - Intermediate Gold Mining Tunnel Instrumentation monitoring.
 - Mesh and Lacing quality control.
 - In house training.

- *March 1992 to December 1992*
Field Assistant - De Beers Consolidated Mines Transvaal Diamond Exploration (TDE)

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- Reporting to the senior geologist at Central Treatment.
 - In charge of the ultra-fine drying section and the sample storage at Cullinan stores.
 - Setting up a database on QA4 computer data base application program for all the samples stored.