

Fritz Van Sittert, Pr.Tech., M.Tech.



Fritz Van Sittert completed his National Diploma (Civil Eng) at the Cape Technikon in 1994. In 1995 and 1996 he completed courses in Construction Management and Urban Engineering and was awarded the BTech (*cum laude*) degree. He received his MTech (*cum laude*) degree in 1999 for novel research done on the turbulent flow of non-Newtonian slurries in rough pipes. He is responsible for administering the PCCE slurry test laboratory and continued development of slurry testing equipment. Fritz has extensive experience in the following fields;

- Large scale pipe loop tests
- Commissioning
- Hydraulic design
- Pilot plant testing
- Process audits
- On site testing
- Viscometer tests
- Wear tests
- Development of novel equipment for the process and mining industry.
- Analysis and modelling of a wide range of slurry types

Qualifications

National Diploma
Engineering: Civil, Cape
Technikon 1994
B Tech Engineering:
Civil, Cape Technikon
1996
M Tech Engineering:
Civil, Cape Technikon
1999

Professional Status

Registered As
Professional Engineering
Technologist

Specialization

Slurry pipeline flow
behaviour, particularly
the flow of non-
Newtonian slurries

Commissioning and
process audits

EPCM contracts

Hydraulic and process
design of slurry pumping
systems

Development of novel
process equipment

Notable Projects

Anglo RBMR MC plant, Rustenburg (2009)

Design, commission and optimization of RBMR MC plant.

Sasol Paste Plant, Secunda (2009)

EPCM contract for fully instrumented past plant.

Site Test Work, Namibia (2008)

Process rheology audit for Langer Heinrich Uranium.

Pilot plant tests, Namibia (2008)

Rheology and pump performance tests for Langer Heinrich Uranium.

Anglo Base Metal Refinery MC Plant Design Review (2008)

Black Mountain Mine Backfill Plant Audit (2007)

Minera Escondida Limitada, Chile (2006)

On Site Thickened Tailings Rheology Test Work

DeBeers AK6 Pilot Plant Test Work (2006)

Anglo Platinum Rustenburg Base Metals Refiners (2006)

MC Plant Milling and Magnetic Separation Optimisation

On-Site Test Work for De Beers Combined Treatment Plant (2006)

Black Mountain Mine On Site Pipe Loop Tests (2005)

DeBeers Voorspoed Mine Residue Disposal Test Work (2005)

Pilot Plant Tests, Brazil (2004)

Cyclone optimization tests for Cuiabá mine tailings.

Impala Platinum Thickener Underflow Investigation (2003)

On site tests conduction an audit for Impala Platinum on the thickeners and pumping system.

Large Scale Pipe Loop Tests for Anglo Platinum Twickenham Project (2003)

Large scale pipe loop tests for the detail design phase of the Twickenham project using the Atok and Modikwa tailings.

Large Scale Pipe Loop Tests for Fairbreeze Mine Plant Relocation Project (2003)

Large scale pipe loop tests using the ROM and sand tailings to gather design information for the Fairbreeze mine plant relocation project.

On Site Tests, Brazil (2003)

Rheological characterisation of Queiroz metallurgical plant flotation tailings. Paste tests on the total tailings. Process audit of Cuiabá mine backfill plant.

Large Scale Pipe Loop Tests for De Beers Finsch Mine, (2002)

De Beers Finsch Mine is evaluating the re-mining of the "Pre 79" dumps. Large scale pipe loop tests have been conducted using the ODS 2 and ODS 3 samples to determine the flow properties of the material.

Process Audit of Orapa No 2 Plant Ultrasep Thickner Control, Botswana (2002)

Orapa mine have been experiencing blockage problems with the No 2 plant Ultrasep thickeners. A process audit of the No 2 plant Ultrasep Thickeners has been conducted to address the operational problems.

Hillendale Mine Pilot Plant Testing, (2002)

Rheological characterisation of the different slurry streams in the process plant during pilot plant testing at Hillendale mine.

Large Scale Pipe Loop Tests for Trojan Platinum's Winnaarshoek Tailings Pumping System, (2002)

Large scale pipe loop tests have been conducted using the Winnaarshoek platinum tailings to gather design information for the pumping system.

Paste Flow Behaviour Investigation, Canada (2001)

An investigation into the flow behaviour of proposed paste mix designs for the surface and underground disposal systems

Paste Flow Behaviour Investigation of Cyclone Overflow for Myra Falls Operations, Canada (2001)

Pipe loop tests to establish pipeline pressure gradient and pump pressure requirements for pumping cyclone overflow past to Tailings Disposal Area 2.

Pipe Loop Tests and Rheological Characterisation of Jwaneng Mine Slimes and Grits Slurry, Botswana (2001)

Pipe loop and centrifugal pump performance tests for Jwaneng Mine for the upgrading of the existing slimes pumping systems to transport co-thickened slimes and grits.

Pipe Loop Tests and Rheological Characterisation of Finsch Mine Slurry, Botswana (2001)

Pipeline and pump performance tests to evaluate the flow behaviour of Finsch mine kimberlite tailings.

Pipe Loop Tests and Hydraulic Design for the Proposed Thickened Tailings System for Osborne Mine, Australia (2001)

Establish the pipeline pressure gradients and minimum operating velocities. Determine the effect of the two slurry types on the performance of centrifugal pumps.

Corridor Sands Fines Disposal Pumping System, Moçambique (2001)

A series of slurry tests were conducted to establish design parameters for the Corridor Sands Fines Disposal Pumping System

Iscor Hillendale Mine, South Africa (2000)

Design audit and review of design of high concentration tailings pipeline. Audit includes assessment of pipe loop test work, rheological analysis, and proposed design. PCCE are completing the front end engineering and specification of 8.8 MPa thickened tailings pumping system.

Orapa Diamond Mine, Botswana (2000)

Conducted on-site test work to evaluate the pumping requirements for high density thickener underflow tailings. The test programme provided design data used for the hydraulic design of the Orapa 2000 tailings system.

Konkola, Zambia (2000)

Pipeline and pump performance tests to evaluate the flow behaviour of Konkola backfill material.

Implats, South Africa (1999-2000)

Pipe loop and pump performance tests on Impala Mine tailings to determine the requirements to upgrade the existing tailings system to transport high density platinum tailings.

Foskor, South Africa (2000)

Pipe loop and pump performance tests on Foskor tailings to determine the slurry flow behaviour and pumping requirements.

Western Deep Levels Gold Mine, South Africa (1998)

Pipeline pressure gradient and wear tests to determine the effect of gypsum addition on the slurry flow behaviour and wear properties of Western Deep Level backfill tailings.

Eskom (Electricity Supply Commission), South Africa (1997- 98)

Pipeline wear tests to evaluate suitable wear resistant pipe lining materials for Eskom ash tailings pipelines. A variety of wear resistant linings were tested. The test results are compared to measured full scale pipeline wear of a test section in an operating tailings pipeline.

Publications

“The effect of pipe roughness on non-Newtonian turbulent flow” by Paul T. Slatter and Fritz P. van Sittert. 9th International Conference on TRANSPORT AND SEDIMENT OF SOLID PARTICLES 2-5 September 1997, Cracow, Poland

“Analysis of rough wall non-Newtonian turbulent flow” by P T Slatter, School of Civil Engineering, Cape Town, South Africa and F P van Sittert, Paterson & Cooke Consulting Engineers (Pty) Limited, South Africa HYDROTRANSPORT 14 on SLURRY HANDLING AND PIPELINE TRANSPORT 8-10 September 1999, The Netherlands, Maastricht.