



DURBAN ROODEPOORT DEEP LTD

BLYVOORUITZICHT GOLD MINE

CARBON IN PULP PROJECT (CIP)



BACKGROUND

MAED as project managers completed a Carbon in Pulp (CIP) project at Blyvooruitzicht Gold Mine (BGM) situated at Carltonville in the Gauteng province of South Africa. The CIP plant has a design capability of 240 000 ton/month and had a project budget of R10,8 million.

The heart of the project, the Pump Cell Adsorption circuit, utilizes 6 x 100m³ cells that operate in a carousel.

SCOPE OF WORK

The project took place in an existing (fully functioning) mine environment and required that it co-exist with ongoing production requirements. This and the subsequent tie-ins into the mines' mainstream production lines were completed with minimal disruption.

Blyvooruitzicht required that mass flowmeters and automatic samplers were installed at the feed and discharge ends of the plant to facilitate mine accounting functions.

The design criteria of the system comprised of the following statistics and can handle both high and low grade slurry.

Throughput (dry tons ore per month)	240 000
Slurry flow (cubic meters per hour)	457
Residence time per pump cell (minutes)	13.5
Slurry RD (tons per cubic meters)	1.45
Solids RD (tons per cubic meters)	2.70
Solids particle size (% minus 45 microns)	75
Pre-screening aperture size (microns)	600
Carbon Size (ASTM)	8 x 16
Viscosity (cPs)	10 to 20 (normal)
Interstage screen aperture size (microns)	650
Operational times	24 hr / day (continuous)



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OPTIMISATION

Our philosophy is one of reduced capital costs being achieved by managing projects on a partnership basis with our clients streamlining the project team.

The control and monitoring of the system is carried out via a PLC. This has significant cost and operational benefits in comparison with the conventional CIP circuit. Carbon management in particular is greatly simplified and there is no need for inter-stage transfer of carbon. A five-ton overhead travelling crane was installed for the removal of the cell screens for cleaning and maintenance purposes.

Project execution without unnecessary overheads and extras ensure that our direct costs are the lowest in the industry.

All civil work was carried out by Grinaker Concrete Construction and included surface beds for the CIP plant, vibrating screen and linear screen structures as well as all pump plinths and bunded areas.

Structural steel work, plate work and erection for all the mechanical process equipment including pipe bridges and pipe runs etc., was completed by Cutlaw Construction.

The main contractor for electrical and instrumentation was Dilect Electrical who were responsible for all MCC, drive and control installations.

The main CIP plant technology and integral equipment was supplied by Kemix (Pty) Ltd.

The duration of the programme from conceptual design through to project completion and handover was nine calendar months.