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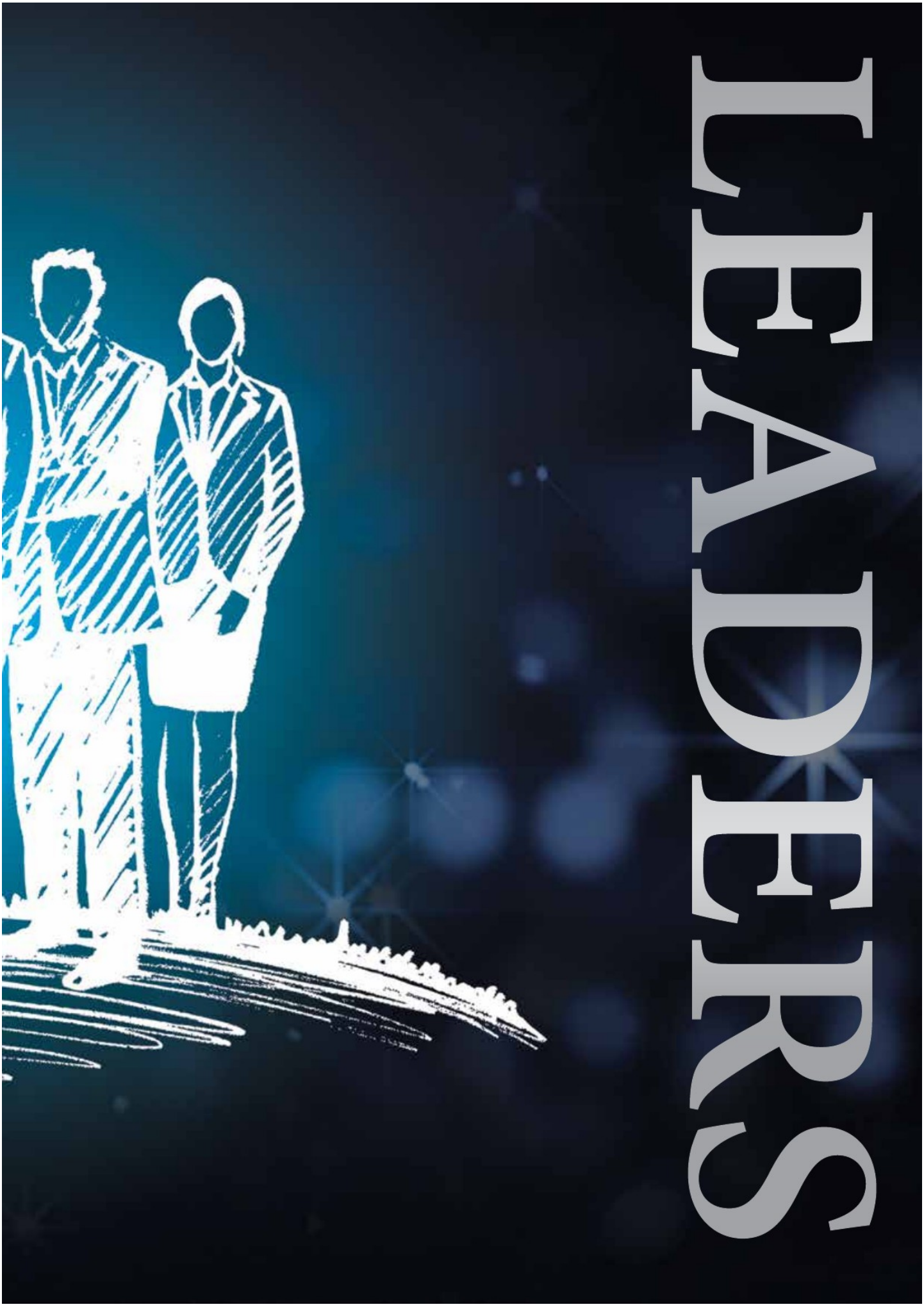
Production Ready Mineral Processing Solutions
Scaleability, Availability, Reliability


LEADERS

MAIN SPONSORSHIP SHOWCASE

GREENFIELDS PROJECT DEVELOPMENT

COVID-19 DIDN'T KEEP CONSULMET DOWN

Strong engineering skill sets and expertise has seen Consulmet's business continue to flourish, even during the worst periods of COVID-19. The company will look back on 2020 as a year of great achievement and highlights four key project successes.

2 - 3tph hard rock plant for gravity recoverable gold for small-scale miners

Small-scale gold mining in Africa has grown exponentially over the last decade with the majority of small scale miners targeting easier to mine, alluvial gold deposits. There has however been increasing activity and interest in the very small-scale hard rock gold recovery space, with many of the small-scale miners looking for cost effective, high efficiency, mobile hard rock gravity recoverable gold recovery plants.

With this in mind, Consulmet has designed a cost effective, recovery efficient, mobile 2 - 3tph hard rock gold plant for gravity recoverable gold.

The entire plant is delivered to site in 1 x 12 m and 1 x 6 m containers and for erection requires a flat surface area of approximately 20 m x 30 m.

The design of the plant is fit-for-purpose and can be operated by two people. The pricing includes all fabrication, pipework, valves, mechanical equipment, and electrics i.e. MCC, electric motors, cabling, start-stop controls, and module plant lighting. Consulmet also offers assistance with the erection, commissioning, on the ground training of local operators and operation of the plant.

The inclusion of a mill into the circuit, instead of an impact crusher, has specifically been done to ensure a finer grind to increase the recovery of gravity recoverable gold. All the client has to provide is power, water and final tailings disposal.

The plant will produce a mineral rich concentrate which flows into a concentrate canister. The concentrate can be sold as is or further upgraded and smelted into gold dore'.

As optional extras, Consulmet can provide a shaking table for the upgrade of the concentrate to a smeltable product, as well as a furnace and pots for smelting. The shaking table and furnace can then be fitted into the 6 m container as a secure gold room.

Securing its largest coal materials handling project to date

In late 2019, Consulmet was awarded its largest materials handling project to date. The lump sum turnkey (LSTK) design, modification, fabrication and complete installation and commissioning of two coal feed bins, two 450 - 500 tph apron feeders, two crushers and two 1 200 mm national road cross-over conveyor gantries complete with conveyors.

Consulmet's scope included the design, fabrication, supply, installation, and commissioning of:

- 2 x 90 t feed bins, complete with 2 x 450 - 500 tph apron feeders
- 2 x roll crusher installation
- Feed chutes into crushers
- Crusher support structure and discharge chute onto the conveyors
- Conveyor supply and gantries for road crossing
- Upgraded discharge area
- All civils and electrical, including installation
- Retaining walls to create feed tip to the feed bins

Consulmet managed to source a second hand conveyor gantry, which was modified to fit two 1 200 mm conveyors, creating a significant saving for the client.

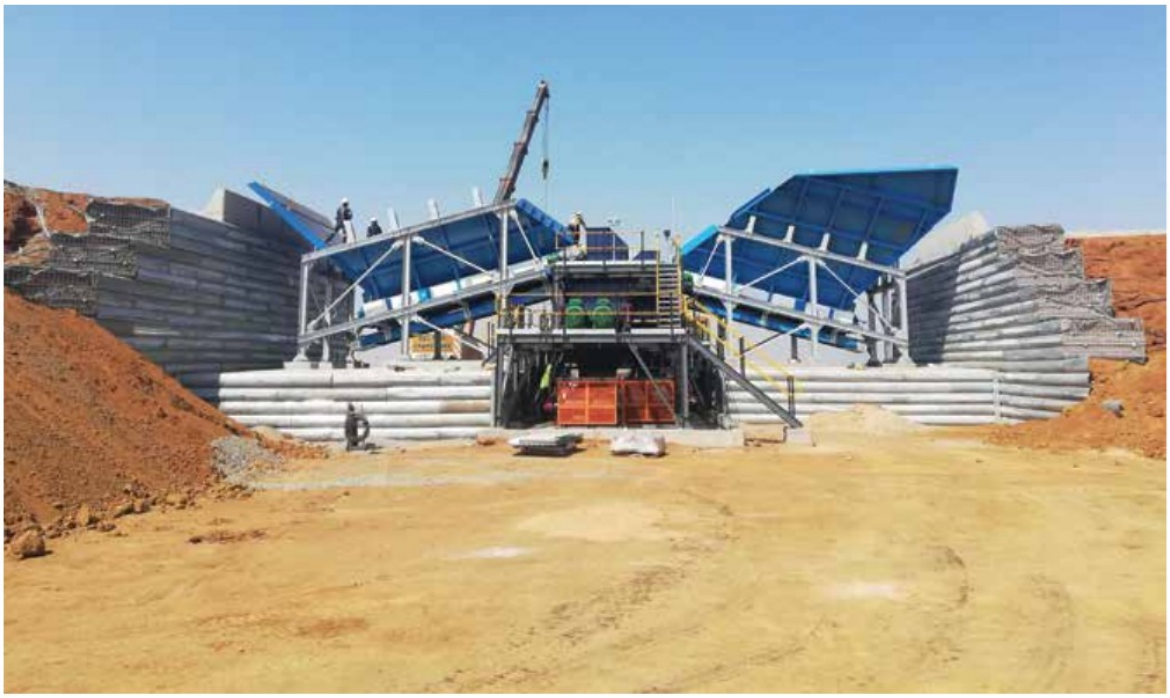
The conveyors and gantry were designed to handle 450 - 500 tph each, operating for 18 hours per day, six days per week, relating to a handling capacity of roughly 200 000 t per belt per month. The gantry was designed and fabricated with two walkways (one on each side of the gantry structure) to allow access for maintenance and cleaning.

Two feed bins, each designed to accommodate 90 t of feed, directly tipped from a 90 t truck, fitted with apron feeders, and suitably protected with liners, were installed opposite one another, to allow the independent feed to each conveyor circuit. This resulted in an improved turnaround time on the trucks, as well as the ability to feed dedicated material from different pit areas. The ramps were constructed using Recosa retaining wall buckets, which were supplied and installed by Consulmet. Material and bulk earthworks to construct the ramps were provided and placed by the client.

Each apron feeder was designed to feed 450 - 500 tph and the apron feeders were fitted with variable speed drives (VSDs) in a control loop with each of the conveyors incorporating a weightometer, to ensure that the belts would always be fed at a controlled feed rate.

The two 1 200 mm wide crossover conveyor belts were fitted with all the required safety equipment to ensure the material would be conveyed in a safe manner over the national road. Speed switches, misalignment switches, rip detectors, nip guards, primary and secondary belt scrapers, were all supplied and fitted to ensure a proper and safe operation.

Image: Consulmet's largest materials handling project to date



For legal and safety compliance, the section crossing the national road was designed and installed with a checker plate bottom floor with kickplates, and the sides and top of the gantries were closed off with sheeting. The steel A-frame columns closest to the national road were protected by stand-alone concrete barriers.

A free-standing, field mounted, weatherproof MCC panel, with PLC controlled interlocks, was also provided to service the apron feeders, conveyor and all the ancillary power required.

The project installation was originally planned to be concluded by the end of May 2020, with the first stage of cold commissioning starting on 1 June 2020. As a result of the COVID-19 lockdown, this schedule was pushed out. Consulmet continued with detailed design and planning during the shutdown which resulted in an accelerated re-commencement of the project immediately after the shutdown. The project was completed and commissioned in December 2020.

A smart 500 tph ROM diamond process plant

On 20 January 2020, Consulmet secured the contract for the LSTK supply of a 500 tph ROM kimberlite processing plant.

The solution from Consulmet included the design and supply of a conventional diamond plant, with five crushing stages, a scrubbing circuit that includes two log washers for additional liberation and to assist with the removal of debris, with a combination of three XRTs sorters that will act as coarse concentrators, three 200 tph fines DMSs and a final recovery with the latest Debtech X-ray sorter design.

The plant has been designed for the recovery of diamonds from the competent kimberlite and high clay content in kimberlite.

The design incorporated various learnings on diamond value management from previous projects i.e. comminution selection, minimising crushing selection ratios, optimising crusher selection and settings, introducing diamond recovery stages between secondary and tertiary crushing stages in applicable size ranges and minimising drop heights at material transfers points.

The plant process flow is inclusive of:

- Front end – pre-primary crushing
- Front end – primary crushing
- Scrubbing and screening module
- Log washer and screening module
- Secondary crushing module
- XRT module
- Tertiary crushing module

Top image: Logwasher module installed as a secondary scrubber on 500 tph diamond processing plant

Bottom image: Left - 200 tph DMS module. Right - XRT sorter

- DMS module
- Quaternary crushing module
- Final recovery module
- Water recovery and reticulation circuit
- Electrical design supply

The Consulmet scope further included all of the interplant conveyors, the interplant piping and control valves, electrics, PLC control and instrumentation.

The project will be designed, installed and commissioned in 15 months (including the effects of COVID-19).

Kimberlite dump re-processing plant utilising logwasher and XRT technology

Consulmet secured the contract for the LSTK design, fabrication, supply, installation, and commissioning of a 70 tph diamond recovery plant. The process plant is initially planned to confirm the resource grade (Phase 1) of previously mined surface resources. The plant will be upgraded to treat fresh ore once additional infrastructure covering mining operations, bulk power supply, bulk water supply and associated buildings are in place.

The Phase 1 scope managed by Consulmet included the construction of a single stream diamond preparation plant with a scrubber, logwasher, elutriation, XRT diamond recovery and sort house. The Consulmet scope further included all of the plant conveyors, piping, electrics, control and instrumentation as well as diesel generators.

Included in the original Consulmet scope was the provision for the manning of the XRT operation only, but due to excellent client relations and the exceptional performance delivered during the installation and commissioning of the plant, the client requested Consulmet to take over the operations and maintenance of the entire plant, including the mining components.

Another successful LSTK project completed by Consulmet, on time and in budget. ■

Image: 70 tph diamond recovery plant

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