



**ENGINEERING SERVICES**

[www.elb.co.za](http://www.elb.co.za)

# Processing Solutions





## ABOUT ELB ENGINEERING SERVICES

ELB Engineering Services (ELB) is an internationally recognised technology driven holistic solutions provider to the mining, power, port, construction and industrial sectors. This is achieved through ELB generated innovation, supply of equipment and technology from our world class partners, in-house developed expertise and integration of the services and products from the ELB Group of companies.

Our engineered solutions are based on our own extensive in-house developed expertise, and enhanced by technology agreements with world-class product and know-how companies.

Our comprehensive services include in-house construction, electrical, control and instrumentation, spares and life extensions and total logistics solutions as an integral part of the overall business.

From design to advice, ELB offers quality engineering services that benefit Stay in Business and Greenfield's operations. Our internationally accredited quality assurance system, coupled with efficient project management protocols, ensures that the client receives a consistently high quality product.

We tailor our services to the needs of our growing client base, and focus on maintaining and building long-term relationships with our clients.

## OUR APPROACH TO MINERALS PROCESSING SOLUTIONS

ELB provides innovative Minerals Processing Solutions in challenging market conditions where most mineral resources are of lower grades than in the past and where capital is constrained. We offer complete turnkey solutions from run-of-mine pit to the port. ELB's skill set includes design and optimisation to provide our clients with cost effective solutions without compromising efficiency and reliability for early revenue generation.

As part of our suite of capabilities, ELB renders a complete service offering from design, manufacturing, erection, commissioning to maintenance and Life Extension programmes. Drawing on a high level engineering and intellectual base, the result is a world-class technical service.

### Specific areas of expertise include:

- Comminution,
- Ore sorting,
- Pre-concentration and waste removal,
- Gravity separation and DMS,
- Flotation,
- Thickening and filtration,
- Utilities and services,
- Simulation modeling.

Minerals processing operations are continuously challenged in terms of ore grades, power and water shortages and Capex constraints. The importance of technology and innovation is paramount in an ever changing mining environment. We pursue step change innovations in our designs.



## **OUR APPROACH TO MINERALS PROCESSING SOLUTIONS - continued**

Using the latest technology available, our minerals processing plants are designed to be robust, reliable and safe, coupled with innovative implementation strategies to ensure time efficient implementation and start up.

### **SERVICES**

Through a multidisciplinary team with world class experience and a deep understanding of mining and operations we deliver technically challenging projects of any scale. ELB has the capability to cover most aspects of your project including non-process related services such as infrastructure and spares.

### **PROCESS INNOVATION**

ELB applies well proven technologies ranging from beneficiation to thickening and ore sorting from our extensive experience and combine these into innovative and flexible process flows and layouts.

### **PLANT UPGRADES, EXPANSIONS AND VALUE PROPOSITIONS**

The ELB team includes experts with extensive experience in operations, mining and daily production. We see every project as a relationship and will take the time to understand the existing process, resource and operations to provide profitable solutions that will differentiate our clients from their competitors.

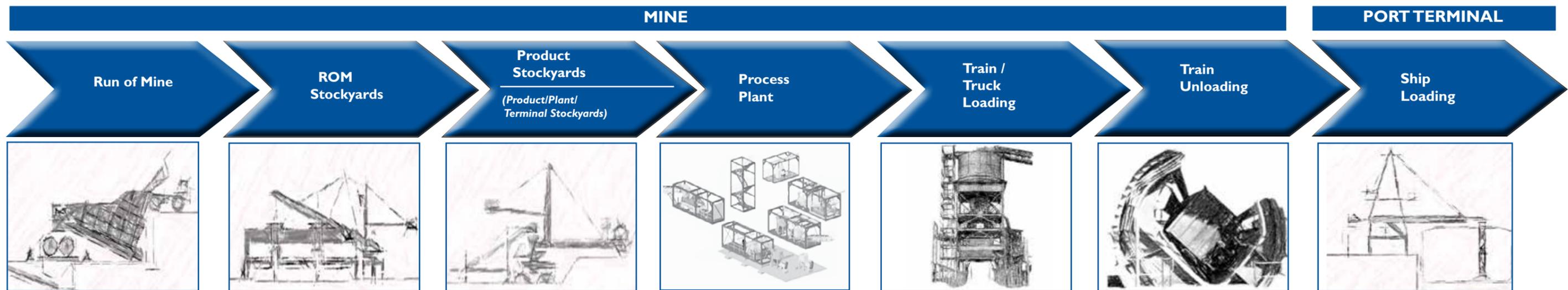
Lower grades of resources, increased costs and environmental challenges demand the application of innovative technology in order for operations to survive and thrive.

With detailed planning and implementation strategies we minimise implementation time and therefore the impact on daily production and operations.





## PROCESSING VALUE-CHAIN



### RUN-OF MINE (ROM)

For ELB, this is where it all starts. The run-of-mine (ROM) ore refers to ore in its natural, unprocessed state. The metal or other valuable material is recovered via "processing". The first stage in processing ore involves crushing and grinding the ROM material to the point where it becomes a fine sand-like substance so that commercially valuable minerals or metals can be separated from the waste material.

As the starting point in the ore processing value chain, ELB's design approach to these systems is to define the point in the curve where particle crushing size and energy consumption intersect to identify the least amount of energy required for the processing operation. ELB designs and supplies crushing and grinding systems that range from mobile plants on skids, rubber tyred or track mounted to static plants.



### STOCKYARDS

When an ELB engineer approaches a stockyard layout and design at a mine, plant or port terminal, it is with the backing of a team with more than 100 years' experience in application engineering to ensure that ROM and product stockyards are optimally designed to the specific client requirements. ELB offers extensive expertise and know-how, whether it be for the supply of stand-alone equipment such as stackers or reclaimers or a turnkey installation.

### CRUSHING AND MILLING

All forms of crushing and sizing equipment are available as custom designed or modular units:

- Primary gyratory, impact, cone and jaw crushers,
- Grinding mills and systems,
- SAG/AG, ball and rod mills.

### DMS

ELB provides Dense-Media Separation (DMS) modules for production of concentrates. Utilizing the difference in material density between liberated particles as the separation mechanism, DMS technology is applied in the diamond and coal processing industry. It is also increasingly being applied in the base metal and Platinum Group Metals (PGM) sectors for pre-concentrating the feed ahead of the main recovery process, significantly reducing the material feed to the mill and removing coarse waste while minimising metal losses.

DMS plants can be configured to follow complex gravity circuits, multi gravity separation and/or other separation techniques such as flotation. This can provide effective low cost solutions to allow the optimal economic recovery of complex ores.

ELB's DMS plants are built as modular plants that can be integrated into overall plant design.



## ELB EXPERTISE

### MAGNETIC CONCENTRATION

ELB has Wet and Dry magnetic separator technology for highly magnetic and weakly magnetic material. Separators can be configured in a 3 in 1 arrangement to optimise Capex and increase overall yield. Dry magnetic separation is possible above 1mm and wet Magnetic Separators operate below 3mm.

### GRAVITY CONCENTRATION

ELB offers the design and supply of the following for gravity concentration:

- Solid Bowl Centrifuges – maximum solids feed capacity of 12 t/hr. Employed in concentrating free gold. High G forces of up to 2500G are possible for the recovery of fine gold particle sizes,
- Sluices – multiple sluice configurations are offered for pre-concentration of heavy minerals or metals such as gold,
- Shaking Tables – a maximum feed solids capacity of 2 t/hr for the concentration of gold, PGM's and other heavy minerals,
- Hindered Bed Settlers – this device uses the hindered settling zone to separate particles having differential density. A range of diameters are offered. Various configurations are possible.

### FLOTATION

ELB has a track record of successful flotation plants operating in Africa, which are processing copper, cobalt, coal and platinum. Twenty years (20) of experience and test work facilities will ensure that our flotation systems will be just right for your application. ELB's robust, reliable, proven design and superior quality gives ELB the edge.

ELB has built its strength on a complete understanding of the process requirements and integrates all the design improvements that have been developed in the last twenty years (20) offering not only the most up-to date technology, but is also (by far) the most cost effective float cells currently available on the market.

ELB uses metallurgical data specific to the mineralogy of the ore processed to accomplish optimum results in flotation technology.

Major features available from ELB Flotation Plants:

- Optimal air control is achieved with ELB's unique impeller design,
- The advantage over conventional equipment is that this system offers individual variable speed and the facility to self-induce optimal air, giving you total control of the flotation parameters,
- Our cell to cell design ensures that each particle has an opportunity to come into contact with air and reagent thus offering optimum recovery,
- Flotation machine does not have air induction limitations,
- Flotation machine reduces flotation train foot print,
- The flotation machine optimises mineral air contact.



## THICKENING

ELB has built its strength on a complete understanding of the process requirements and integrates all the design improvements that have been developed in the last twenty years (20) offering not only the most up-to-date technology, but is also (by far) the most cost effective thickener currently available on the market.

ELB uses metallurgical data specific to the mineralogy of the ore processed to accomplish optimum results in solid-liquid separation processes.

Our new design features the option of a fully bolted construction which has numerous benefits. At this current time we have designed, manufactured, erected and commissioned several of these thickeners with great success.

Our world leading knowledge, as well as our vast experience combined with a number of in-house technologies, enables us to produce an optimal efficient thickening solution.

We are capable of supplying thickeners that range from 1 metre to 120 metres.

### Our range includes the following:

- Rapid rate thickeners,
- Paste thickeners,
- High density thickeners,
- Ultra-high rate thickeners,
- Lamella thickeners.



## FILTRATION

ELB offers the design and supply of Chamber and Membrane Filter Presses. Our capabilities include sizing, specification, commissioning, supplying of spares and after sales service. We specialize in custom design and supply of totally integrated and packaged plants including pre-thickening, filter feed systems, filtrate management, and filter cake conveying. The filter press range offers high end-of-cycle pressures to achieve maximum cake moistures. Filter cake and cloth washing, options are available. Automated, semi-automated or manual filter press cycle control, plate shifting and cake discharge systems can be supplied. A filter press area of up to 1000 m<sup>2</sup> is possible. Design alternatives include overhead or side-bar frames.

### Process plant experience extends to:

- Gold,
- Diamonds,
- Copper recovery,
- Sand plants,
- Lime slaking,
- Coal washing,
- Iron ore beneficiation,
- Chrome.



## ZERO HARM

The ELB Health, Safety & the Environment (SHE) policy guides all of ELB Engineering Services activities and operations to minimise risk to employee health and safety as it continuously strives for zero harm. Business processes are certified in compliance with OHSAS 18001. As part of its commitment to a harm-free environment, ELB projects are conducted in a sustainable manner to ensure minimal impact on the environment.



## QUALITY

ELB is committed to meeting and exceeding best practices and standards within the industry. The company is certified for compliance with international quality management standards (ISO 9001) and proactively manages quality control throughout all its own and its sub-contractors' operations using a formal quality assurance procedure.



## PROJECT MANAGEMENT

Leading-edge project-management systems ensure a high level of control over all stages of a project, with cost and time overruns minimised by timeous management techniques. Productive utilisation of project resources is achieved by integrating the entire project process using best-of-breed software for design, engineering, 3D modelling, cost management, planning, materials control and document tracking and control.



## RISK MANAGEMENT

ELB's de-risking capability co-ordinates the company's collective technical, project execution, construction, financial and relationship building skills, using:

- Structured risk and project management tools that take into account that each project is unique in size, shape, complexity and execution.
- Qualitative and quantitative de-risking methods, supplemented by a broad risk management plan, to continuously evaluate projects in terms of risk from business development to completion and hand-over.

## CONTRACT MANAGEMENT (FLEXIBILITY) AND PROJECT FINANCING

ELB offers flexible contracting options tailored to the requirements of small to mega-sized projects, covering technical audits, studies, EPCM services, turnkey solutions, and life extension and after-sales services.

A project financing facility operates in conjunction with a leading financial institution.



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