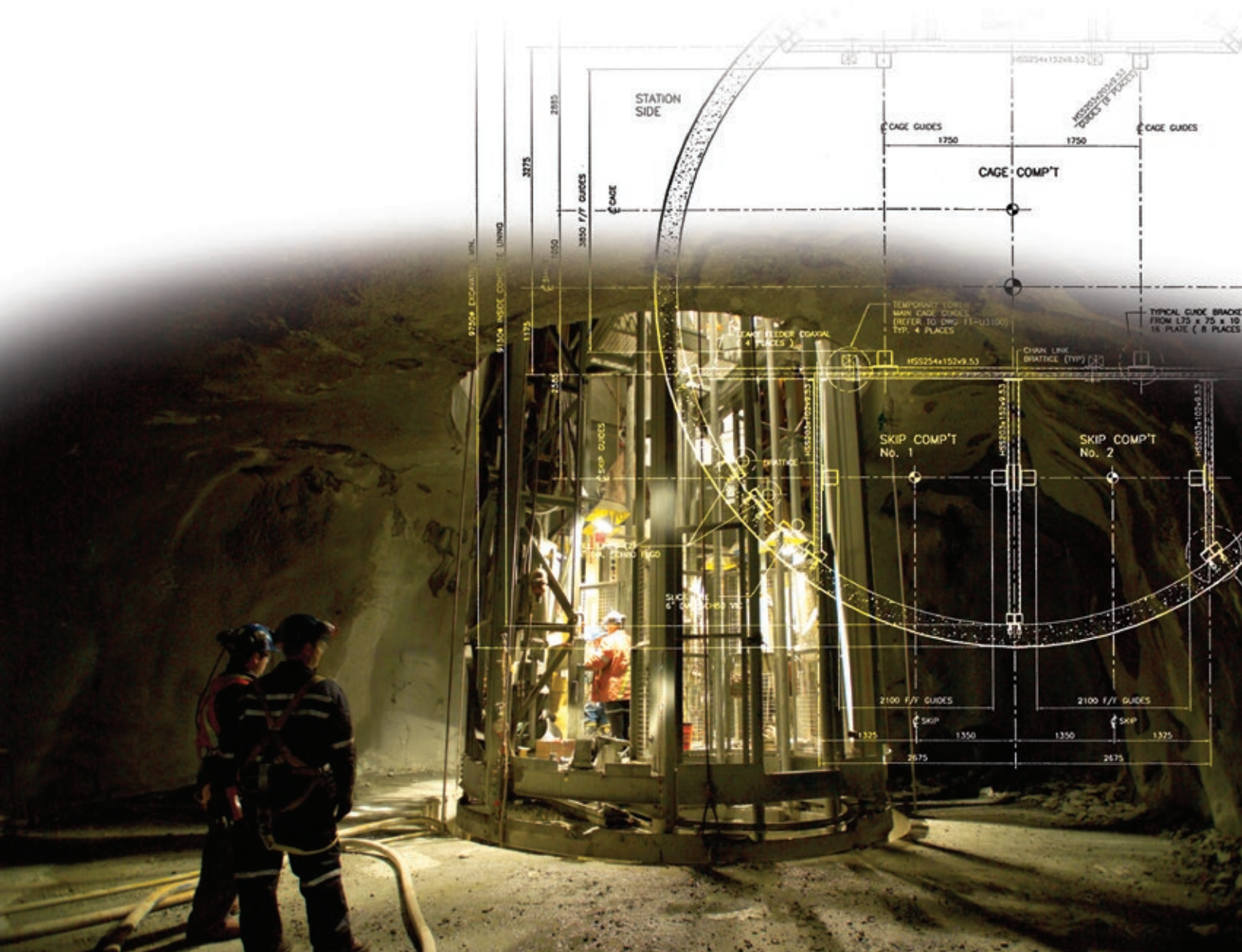


ENGINEERING EXCELLENCE

SAFE, CONSTRUCTIBLE, OPERABLE, MAINTAINABLE INFRASTRUCTURE
FOR UNDERGROUND MINES



BETTER BY DESIGN

A strong influence on our growth as a company has been the presence and sustained growth of our multi-disciplinary engineering group. As part of Cementation's seamless design-build approach, our engineers and technologists are an integral part of the construction process. Our solutions translate into safe, constructible, operable and maintainable designs leveraged from Cementation's experience as an international mine contractor, incorporating actual project experience into all of our designs and study work.



MINE ACCESS AND INFRASTRUCTURE

Our areas of expertise in mine access and infrastructure include

- Mine shafts: shaft liners through all rock types
- Hoisting systems: hoists, headframes, binhouses, shaft guidance systems, loading pockets
- Underground material handling: bins, loadouts, conveyors, ore passes, grizzlies, rock breakers
- Services backbone: piping, power distribution, communications
- Mine dewatering: pumping systems, pump rooms
- Mine ventilation: shaft sizing, fan selection/design
- Underground mine facilities: shops, magazines, refuge stations

We find the right balance between Operability and Constructability. We are committed to making decisions that are in the best interest of the overall project.

INNOVATION

Our innovative solutions deliver the safest infrastructure and achieve the greatest value for our Clients.

Borehole Hoisting: From early engineering, the Cementation team identified an innovative material handling solution by combining proven current technologies into a borehole hoisting shaft, saving the Client on schedule and capital.

Injection Hoisting: Using a combination of existing and proven crushing, pumping and slurry technologies, Cementation has developed a proof of concept model for process injection hoisting that would eliminate the need for mine shaft production hoisting or trucking by transporting ore to the surface using a pump driven pipeline loop. The technology is adaptable to all mining methods and would substantially reduce energy consumption and ventilation requirements.

PROJECT LIFE CYCLE

From an advisory role to full project stewardship, Cementation's engineers and designers can bring value at any stage of the project life cycle: mine studies, scoping, conceptual, pre-feasibility and feasibility study, detailed design and project delivery, sustaining capital as well as project closure.

MINING STUDIES

In addition to underground access and infrastructure studies, the Mining Studies team within Cementation's engineering group provide 3D mine design, economic modelling and analyses as well as enhancements to geotechnical assessments, estimating and scheduling. Our team of senior engineers are Qualified Persons in their areas of expertise, as defined by NI 43-101 Standards of Disclosure for Minerals Projects and as such, capable of supervising and completing the preparation of a technical report in accordance with Form 43-101F1.

In completion of estimating, scheduling and engineering design, we are able to leverage our experience as a mine contractor to incorporate actual project experience into all of our designs and study work.

STUDIES

Early Involvement: Early involvement from Cementation Engineering can dramatically increase project success by utilizing our specialist knowledge in the design of mine access (shaft and ramps), mine infrastructure, material handling and mine design. The greatest influence on a project's capital cost and schedule is during the early stage of the project - through early involvement, a "best for project" attitude is adopted by all parties. We are very flexible in how we can become involved in projects, from an advisory role right through to full project stewardship.

Study Drivers: Our reviews include constructability, cost, schedule, economic analyses, safety/risk analyses and mitigation, and maintaining ore/revenue flow.

Study Stages: We can participate at any stage of study, including trade-off, preliminary economic modeling, scoping, conceptual, pre-feasibility and feasibility.

DETAILED DESIGN

Maximizing Value: Our goal is to achieve maximum value for our Clients. Because we are a design-build mine contractor, we draw heavily on lessons learned from previous work from both an engineering and construction perspective.

Areas of Specialization: Mine access, development and underground infrastructure are areas of specialization for Cementation.

Safety in Design: Cementation Engineering believes in managing safety in the following priority: eliminate or substitute hazards; engineer safeguards to control unavoidable hazards; procedures and warnings; and then personal protective equipment.

SUSTAINING CAPITAL & SITE SERVICES

Sustaining Capital: We participate in all sizes of sustaining capital projects – from small to large and technically challenging. One of our specialties is extending the Life-of-Mine by deepening mine access, including extension of existing personnel and material access, ventilation, power, material handling, dewatering and other services.

Asset Condition Surveys: Cementation's full complement of discipline engineers and quality assurance specialists can conduct on site asset condition surveys and assessments to develop strategies for repair, maintenance and more efficient use of existing infrastructure.

Mine Closure: When it is time for closure, we can assist in the design of mine caps, hydrostatic bulkheads, and services capping.

GLOBAL FOOTPRINT

As a global company we have local experience in many areas of the world, providing Cementation access to design and cost information that takes into account local conditions and productivity. This knowledge base is further enhanced with access to expertise and services through affiliated Murray & Roberts companies within the Cementation Group, such as Murray & Roberts Cementation in South Africa and RUC Cementation in Australia.



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