



Engineering
for people



OUR EXPERTISE IN MINING AND METALS



cima.ca



A LEADER IN CONSULTING ENGINEERING



EMPLOYEE-OWNED AND CLIENT FOCUSED

With more than 30 years of industry experience, CIMA+ is the consulting engineering firm of choice across Canada. Our interdisciplinary team works hand-in-hand with clients to deliver exceptional results on projects large and small.

We are proud to be employee-owned and rated one of Canada's best employers. This unique business model supports our strong culture of excellence, entrepreneurial spirit, and accountability. Clients love working with our talented roster of professionals and we take pride in delivering successful projects that set the stage for long-lasting, partnerships.

40+
offices across
Canada

30+
years of industry
experience

3,600+
employees



“ We wish to make a difference with our employees, clients, and business partners to shape an inclusive, fair and carbon neutral world. We must work towards this ideal that is not contrary but rather complementary to the sustained growth we are aiming to achieve. ”

Denis Thivierge, P. Eng.
President and Chief Executive Officer



MINING IS CRUCIAL NOW MORE THAN EVER

Today’s mining companies are innovating, and reshaping how they operate to be more eco-responsible. They have the important responsibility of implementing the main principles of the Mining Association of Canada Towards Sustainable Mining (TSM).

Mining companies contribute to the industrial development and the fight against climate change by providing the valuable natural resources that are essential to our society’s energy transition. The Canadian subsoil is namely rich in lithium, nickel, graphite and cobalt, minerals that are essential

in the production of batteries for electric vehicles. When mines operate responsibly, they can create jobs and are vectors of change in transportation electrification, and several other regional and national economic issues.



HELPING MINES FOR MORE THAN 30 YEARS

With more than 30 years of experience in Canadian mining, our multidisciplinary teams offer integrated services adapted to this very demanding sector. Our people cover all fields of engineering expertise, from mine to port. Over 300 engineers and technicians are directly involved in numerous mining projects of all sizes every step of the way.

Thanks to our hands-on approach and our on-site presence, we have a better understanding of our clients’ needs and of the constraints associated with the remoteness of most mining sites. Our creative solutions are focused on constructability and meet the most challenging standards imposed by the mining industry.

We have helped a wide variety of clients meet their goals by bringing niche expertise to the table on an “as needed” basis, while providing a critical mass of specialists to manage and execute projects of all sizes.



MINING IS CRUCIAL NOW MORE THAN EVER

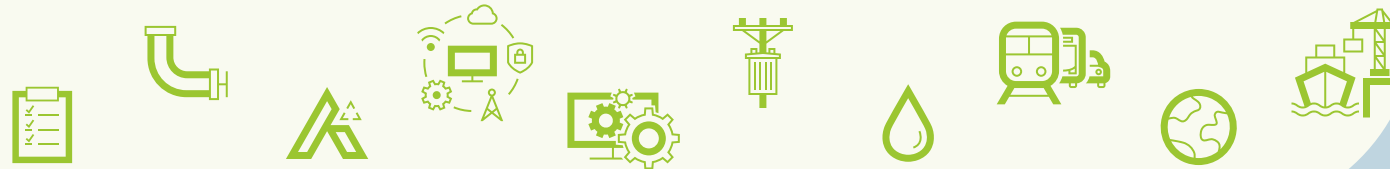
ALL UNDER ONE ROOF

Mining know-how

- Mine-to-port
- Bulk handling optimization
- Mineral processing and metallurgy
- Tailings and waste management
- Potable and process water management
- Mining infrastructure
- Energy management and transition
- T&D, substations, and utility interconnection
- Rail and road accesses
- Telecommunication systems and cybersecurity
- Automation of operations
- Environmental assessment and permits
- Decarbonization master plan

ENGINEERING

- Process
- Mechanical and piping
- Civil and structure
- Electrical and automation
- Transmission and distribution
- Water engineering
- Instrumentation and controls
- Telecommunications
- Rail and transportation
- Ports and marine
- Earth and environment



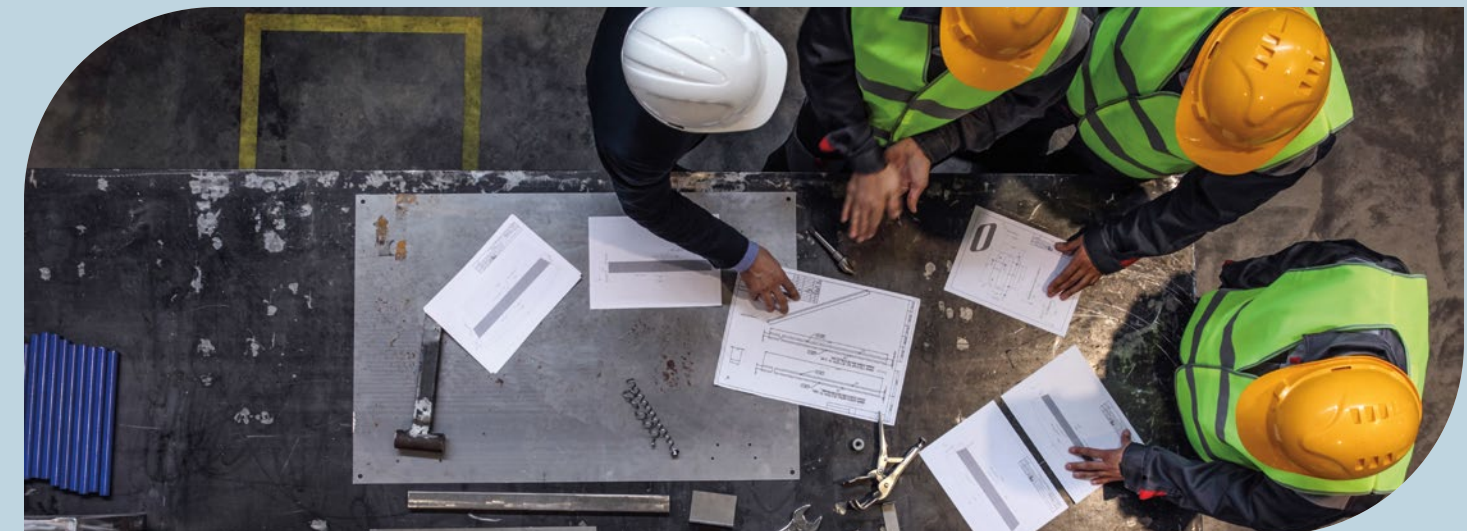
EXTENSIVE BROWNFIELD EXPERTISE

Our goal is clear: meet the needs of eco-conscious clients who also want to be profitable.

When buying new equipment is not an option, our mining specialists are at their best. They make sure to extend the life of expensive corroded or worn-out equipment and structures without compromising safety. Their risk management skills did not fall from the sky: they earned them, with over 20 years of brownfield projects under their belt. The flexibility and quick turnaround time of our teams ensure the sustainability of mining facilities, operational and energy efficiency, worker safety, process automation and greenhouse gas (GHG) reduction.

Increased production and ore recovery rates with efficient case studies and flow streamlining.

Minimized downtime and safer / faster maintenance with optimized crushing, grinding, classification, dewatering and beneficiation process.





MINING IS CRUCIAL NOW MORE THAN EVER

SPECIALISTS YOU CAN COUNT ON

Many of our specialists have not only worked as consultants, they also have experience working with owners.

Our team has a strong sense of the realities of operations, and use this common sense in our greenfield design. We look at the constructability of our designs, possible operation clashes during implementation and the impact commissioning can have on the site.

Our low turnover rate is namely due to...

- Ongoing employee development through the participation to stimulating projects and multiple training opportunities
- Competitive compensation (salaries and benefits)
- Access to shareholding based on performance





WHAT WE DO BEST



CIMA+'S EXPERTISE IN PROCESS ENGINEERING

Our process specialists can help you find the best solution for your plant. They are experts at complex problem solving and in all aspects of metallurgical studies from preliminary economic analysis to tailings management projects.

Our process team has expertise in the following:

- Development of metallurgical network and data analysis
- Conceptual studies
- P&ID and process flow diagram development
- Flow sheet optimization
- Functional description, equipment selection and sizing
- Mass and heat balances, water balances
- Material handling and slurry piping design
- Reagent storage and mixing facilities
- Advanced process simulation tools

Our process professionals have successfully completed many projects of all sizes. Their experience covers:

- Ore size reduction
- Leaching (CIL/CIP)
- Gravity separation
- Flotation
- Solid-liquid separation
- Tailings management
- Filtration
- Dewatering
- Hydrometallurgy
- Pyrometallurgy
- Slurry pumping





WHAT WE DO BEST



MINE-TO-PORT ENGINEERING

Our staff have extensive experience in key mine-to-port components such as bulk handling design and implementation, dock design and repair (including in northern climates), as well as rail spur design, and loadout towers. For example,

when a stacker's mechanical failure was preventing the unloading of a vessel at a cost to our client of \$10,000 a day, CIMA+ quickly developed a rolling repair procedure after review and analysis.



BULK HANDLING

CIMA+ offers comprehensive services integrating equipment in existing sectors of operation. Our mechanical specialists, assisted by their automation colleagues, can optimize handling processes for both raw materials and finished products. Our experts know the suppliers of handling equipment and the qualities and defects

of their products. They have solved a long list of failures and meticulously oversee many increases in capacity, always within budget. Our specialists are also proficient in sequential controls, variable frequency drives and intelligent pneumatic or hydraulic systems, resulting in significant productivity gains and reduced maintenance costs.



WHAT WE DO BEST

INDUSTRIAL AND PLANT ENGINEERING

Why our knowledge of suppliers matters

- More accurate equipment pricing based on technical specifications, datasheets and scope of work
- Take on OEM's experience on similar projects
- Better constructability: Integrated engineering, mine design and mine planning
- Prefabricated modules can be delivered to the site to reduce erection costs
- Quickly turnaround for information and models to support engineering design and estimate
- Optimized Operation Readiness Plan (ORP)

Over the years, CIMA+ has distinguished itself through its partnership approach in plant engineering, which makes it an “extension” of its clients’ internal engineering. Our teams carry out numerous projects in compliance with daily plant activities and specific client and site standards. Thus, designs are optimized by integrating seamlessly with existing systems, such as spare parts management or factory downtime scheduling. This proximity to the specific needs of factories has allowed us to develop an enviable expertise in all industrial auxiliary services.



SAVING YOU TIME AND MONEY

Most of our specialists have spent years on clients’ construction sites and facilities. As a result, their designs consider a host of important details that facilitate constructability, operations, and maintenance.

GETTING THE MOST OUT OF SUPPLIERS

CIMA+ works closely with leading mining equipment manufacturers from the earliest stages of projects. More than ever, the selection criteria for new equipment must be carefully defined to select the best options as early as possible to avoid major project delays.

ENFORCING EQUIPMENT WARRANTIES

When one of your critical pieces of equipment is lagging, we can help you repair it at the best possible price. Our electrical engineers are here to negotiate with manufacturers and provide clients with a clear view of motors’ condition and warranties.

CONSTANT FOCUS ON CONSTRUCTABILITY — WORKING WITH CONTRACTORS

Keeping a constant eye on construction makes a world of difference when it comes to major or complex projects. Early in the design phase, we consider the client’s and contractor’s experience to identify risks and avoid problems during construction, as well as delays in the project delivery. CIMA+ knows how to manage early contractor involvement (ECI) to the benefit of clients..

Why working with contractors matters

- Shorter project delivery duration
- Greater certainty regarding cost and schedule
- More accurate workforce planning for the construction phase
- Better understanding of the project from a contractor’s point of view, which provides for developing a contractual strategy more specifically focused on the success of the project



WHAT WE DO BEST



INDUSTRIAL ELECTRICAL ENGINEERING

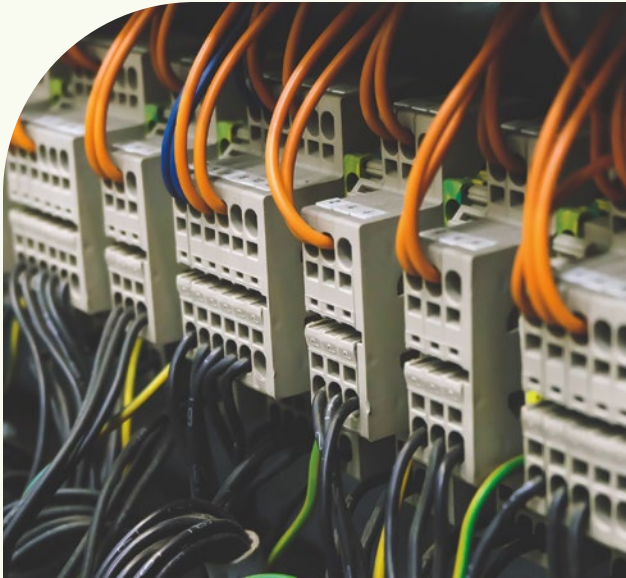
Over the past decades, CIMA+ has been a major contributor in the expansion of the Quebec electricity grid. Our teams designed thousands of kilometres of transmission lines and distribution networks and hundreds of substations for utilities and major mining and industrial companies.

Our industrial electrical team provides a full range of services, including power supply, network management, equipment protection, energy recovery, optimization of existing networks and commissioning.



AUTOMATION AND INSTRUMENTATION

Any industrial process is linked to the measurement and control of the variables of its production. The selection, networking and proper installation of instruments and control systems are part of a process that CIMA+'s industrial teams fully master. We integrate into our clients' projects programming and start-up of programmable logic controllers and operator interface systems from the best suppliers on the market.



ENERGY MANAGEMENT

Merging solar and wind energy with battery storage systems can generate huge savings for off-grid mines. CIMA+ is your one-stop shop for the successful implementation of a microgrid. This includes knowledge on how to integrate different types of energy sources, building energy management, energy storage and controllers, as well as often overlooked cybersecurity requirements. Furthermore, our team has the knowledge and skills required to integrate several energy sources simultaneously, which can then be managed in real time. We constantly focus on reducing operating costs, enhancing reliability for smooth operations and ensuring worker and machine safety.





WHAT WE DO BEST



CIVIL, STRUCTURAL AND BUILDING ENGINEERING

The location of the mines, often remote from major cities or in arctic regions with cold weather and rugged terrain, requires specialized expertise in terms of infrastructure design. Our civil experts have carried out many access road projects for mining clients and those in remote areas.

Our civil and structural engineering specialists adapt their designs to industrial requirements. They are familiar with industrial standards and practices, as well as all the constraints related to the continuity of production or plant shutdown work.

We can perform structural inspections using a risk matrix developed, based on our extensive field experience. This matrix allows us to categorize the failures observed according to their severity and recommend solutions based on the level of urgency.

Structural assessments

- Upgrading to standards and seismic reinforcements
- Upgrading and strengthening of existing structures
- Design of walkways and equipment structures
- Concrete, galvanized steel and stainless-steel structures
- Site development and drainage
- Access roads
- Equipment foundations



MECHANICAL AND PIPING ENGINEERING

CIMA+ specialists can ensure the implementation of all process equipment, regardless of its complexity. We have supported our clients both for simple additions of equipment and building of complete factory sections.

We master expertise related to the specialized piping required for the installation of industrial equipment. Complex designs and prefabrication are studied while considering installations that are typically carried out during plant shutdowns which need to be limited to a minimum.

Mining facilities are subject to vibrations and chemicals, and their maintenance requires working at heights or in confined spaces. We can also offer permanent solutions to accelerate repetitive maintenance work. Sometimes, it's as simple as providing maintenance staff with well-located anchor points, beam clamps, lifelines and anchor eyelets.

Typical services

- Implementation or modification of equipment
- System integration
- Plant development
- New plant design or existing plant expansion
- Productivity studies
- Site management and supervision
- Safety of machinery, tools and industrial processes
- Drafting of equipment maintenance procedures
- Execution of qualification protocols (installation, operation, performance)



1 Structural inspection



WHAT WE DO BEST



POWER PLANTS AND DAMS

Founded in 2006, CIMA+'s Hydro and Dams division offers integrated engineering services that meet the legal requirements specific to each region. We help each client assess whether it is more advantageous to invest in new power plants or modernize existing facilities, based on technical and economic feasibility. We also manage the project, providing adequate documentation and ensuring that work progresses safely, on schedule and within budget, and producing deliverables that meet the highest industry standards.

Our approach is based on extensive experience in the development, construction, rehabilitation and upgrading of energy production structures and facilities to bring them into compliance with current standards.

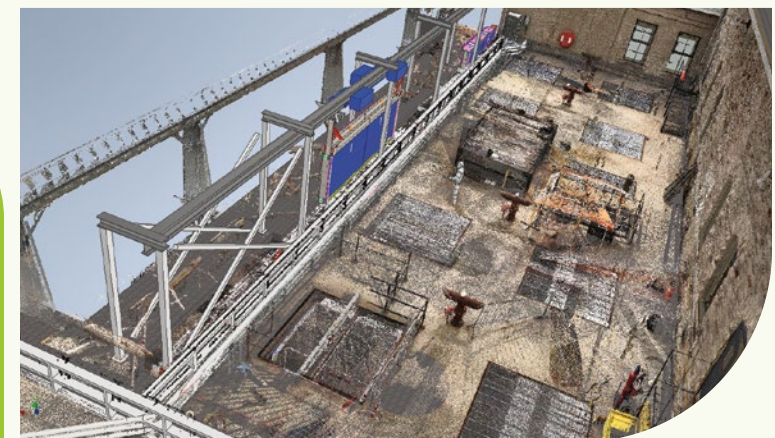
Leveraging its expertise in hydraulics, geotechnics, electromechanics, heavy mechanics and structural engineering, CIMA+ offers optimized solutions for power plant and dam construction, rehabilitation and expansion projects, providing high-quality, tailor-made deliverables to meet the specific needs of public utilities and private sector clients. Thanks to our close relationships with independent power producers and major utility providers, our team

stands out as an industry leader. We also have the skill set to manage your project from design to operation, including technical and environmental studies, due diligence and construction supervision.

Our understanding and experience of various provincial laws and regulations have enabled us to successfully complete numerous safety assessments of dams and hydraulic structures across Canada. This expertise facilitates the process of obtaining the necessary government authorizations for the construction, rehabilitation or upgrading of dams and hydroelectric structures.

Services offered

- Application for permits and environmental authorizations
- Dam safety and upgrading of structures
- Complete life cycle of structures, including opportunity studies, optimization, engineering, construction monitoring and commissioning
- Increase in production capacity
- Hydrological and hydraulic studies
- Geology and geotechnics
- Mechanical auxiliary systems and electrical equipment
- Control, protection and automation engineering
- Turbine-generator mechanics, including equipment selection, optimization, design and operational support
- Heavy mechanical engineering: valves, grooves, lifting systems





WHAT WE DO BEST



DECARBONIZATION: STUDIES AND MASTER PLANS

Across Canada, mining companies are actively seeking ways to reduce their greenhouse gas (GHG) emissions and minimize their impact on local ecosystems. Climate change also poses significant risks to existing infrastructure and operations, challenging the industry's long-term resilience.

In response to these growing needs, CIMA+ has developed a specialized range of sustainable development consulting services designed to help clients in the mining sector navigate decarbonization, GHG reduction planning, regulatory compliance, climate risk and vulnerability assessments, as well as the development of climate change adaptation pathways. Our services also include assessing the feasibility of electrifying your vehicle fleets to support your transition to low-carbon operations. Using advanced modelling and simulation tools, we assess the impact of climate change on existing infrastructure and develop realistic action plans to help you adapt and strengthen your operations.

Beyond strategic advice, our team is the ideal business partner to translate these recommendations into action, thanks to our first-class engineering services and technical expertise in integrating solutions and technologies that will help you decarbonize your operations and assets.

CIMA+ can guide you through each step of the process, offering technically sound solutions that are strategically aligned with your operational objectives and compliant with current regulations.



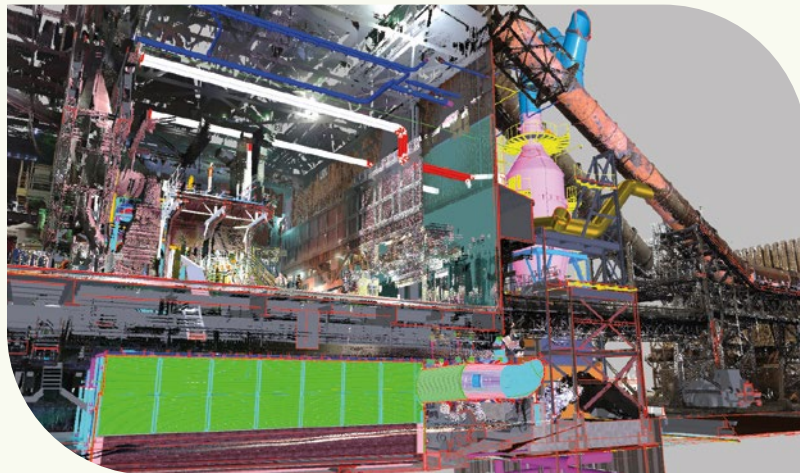


WHAT WE DO BEST

DRONES AND LAND SURVEYS

We use innovative technology to speed things up: digital modelling of engineering structures using Virtual Design and Construction (VDC or BIM), surveys (using 3D scans and drones), and all-in-one auscultation and diagnostic services for underground pipelines.

By combining the accuracy of 3D scanning with the high resolution of drone photogrammetric surveys, we offer a value-added solution for carrying out visual inspections of infrastructures (bridges, buildings, chimneys) or modelling an existing environment with minute precision.



TELECOMMUNICATION SYSTEMS

At CIMA+, we provide customized solutions for wireless and wired telecommunications for every kind of business, organization or company based on their needs, requirements, budgets, and objectives.

We can re-engineer your network architecture to support your business growth and meet your current and future needs. We ensure that you have stable state-of-the-art wireless or wired networks with the highest level of reliability and security, and high data storage and processing capacity.





WHAT WE DO BEST



RAIL ENGINEERING

Our team understands how railways operate, their processes and procedures. As recognized leaders in our field, we take pride in our ability to not just produce drawings, specifications and reports, but act as trusted advisors to assist our clients throughout the design and construction process.

Our railway engineering team provides tailor-made solutions that integrate your specific. Whether your project involves planning, design or construction, we provide assistance with:

- Yards and terminals
- Operation planning and analysis
- Route planning and corridor studies
- Railway bridges
- Railway signals
- Roadway/railway crossings
- Crossing safety assessments and whistle cessation studies
- Regulatory support
- Surveys and geomatics



PORT AND MARINE ENGINEERING

CIMA+ has been active in the field of port and marine engineering since its foundation. Our professionals have in-depth experience of structures' complete life cycle, including the design, study, supervision, construction management and execution, as well as inspection and assessment of infrastructure assets.

Our achievements include several hundred completed projects involving a wide variety of infrastructure assets such as:

- Solid and liquid bulk terminals
- Container terminals
- Commercial and industrial ports
- Locks and breakwaters, etc.
- Harbour terminals
- Protected marine infrastructure assets
- Stabilization and protection structures

Regardless of a project's scale, our team considers the need to ensure the continuity of operations, the challenges arising from geotechnical and climatic conditions, the realities affecting remote or isolated regions, and the environmental constraints. The solutions put forward by CIMA+ are compliant with all applicable standards, requirements and regulatory frameworks governing port and marine engineering.





WHAT WE DO BEST



EARTH AND ENVIRONMENT

CIMA+ offers a full range of environmental services to help clients successfully complete their projects regardless of scale or complexity.

Our environmental professionals work regularly with CIMA+'s design and engineering teams and are adept at navigating the project-approval process through their solid knowledge of the regulatory frameworks in which they work. Our team includes environmental and geological engineers, hydrogeologists, geographers, biologists, foresters, arborists, botanists, environmental practitioners, landscape architects and designers, urban planners, geomatics specialists, and technicians who specialize in the collection of environmental field data. They provide our clients with specialized services and professional and technical guidance.



1 Sediments and contaminated soils characterization



WHAT WE DO BEST

OUR SOLUTIONS ARE FULLY ADAPTED TO NORTHERN CONDITIONS

Mines located in arctic regions far from any power grid face a specific set of challenges.

Ore extraction and transformation require reliable and powerful energy sources, while equipment must be able to operate at -40 degrees Celsius. Shipment of heavy equipment requires barges that only operate a few months a year.

After completing more than 1,000 projects in northern areas, CIMA+ understands all the obstacles and constraints that mines face.

Limited transportation of goods by sea or rail

The delivery of our engineering services is dependent on rail and sea transportation restrictions in northern regions, which means that we have a yearly window of opportunity of one to two months in terms of material and equipment transportation. In the framework of the projects we carry out on behalf of our clients, we often design with the materials already available on site and we also recycle and repurpose discarded containers, steel, wood, etc.

Design for northern climate

We comply with all applicable standards pertaining to buildings in northern regions. For example:

- Load calculations for heating and insulating buildings
- Impact of heavy winds and snow loads on roofs and structures
- Backup source of energy
- Permafrost constructability

Modularization strategies for constructability

Used to maximize on-site assemblies. Our specialists have extensive experience in modular design, which facilitates on-site assembly.





OUR EXPERTISE AT YOUR SERVICE: A DEMONSTRATION OF OUR KNOW-HOW

BOOM STACKER AND CONVEYOR DESIGN MODIFICATION

CIMA+ was entrusted with performing the detailed engineering for modifications to be made to an existing boom stacker and a conveyor in preparation for the installation of a temporary telestacker.

After analyzing several options, the team decided to replace the old and corroded tripper structure with a new conveyor section. The existing conveyor was adapted and reinforced to allow for the installation of this new conveyor section. New precast concrete foundations were provided to heighten the existing conveyor, new conveyor section, and telestacker.

The project costs were adapted to be appropriate for an installation made to last $\pm$ 2 years. To accommodate the client's schedule, CIMA+ quickly provided a realigned design, when the project scope was modified after the beginning of the detailed engineering due to site conditions. In addition, the construction took place during winter, with most surrounding equipment in operation.

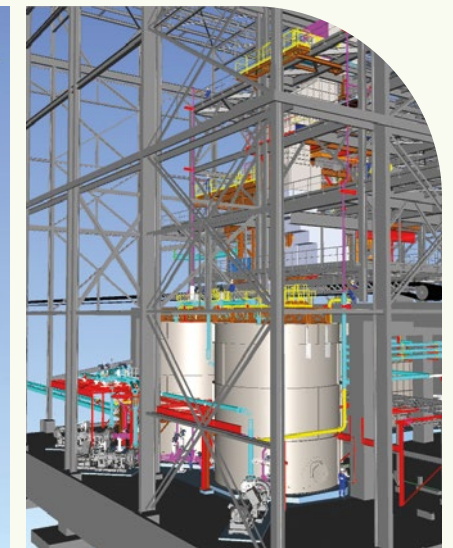
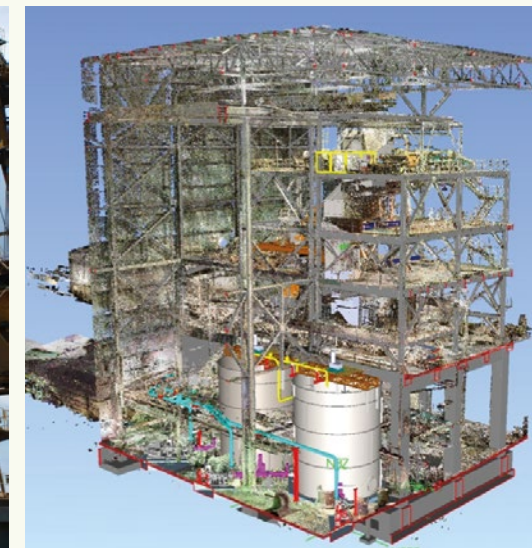
OPTIMIZING THE GRINDING CIRCUIT TO OPERATE A PLANT AT FULL CAPACITY

CIMA+ provided a solution to the operational challenges paused by a milling circuit in a mining plant, which prevented the facility from reaching full nameplate capacity. The objective of the CIMA+ design team was debottlenecking the milling circuit.

A large percentage of fines (i.e., material finer than 1 mm) were observed to consistently re-enter the milling circuit as fresh feed. Already being at the target size, this material takes up capacity within the mills, and further reducing its size provides no benefit to the process. CIMA+ proposed to prescreen the minus 1 mm material prior to milling.

Therefore, fewer milling lines would be required to process the reduced mill feed, which would ensure full nameplate capacity was achieved.

CIMA+ designed the fine by-pass system that removes the fines from the mill circuit feed and pumps it directly to the existing gravity concentration circuit.





OUR EXPERTISE AT YOUR SERVICE: A DEMONSTRATION OF OUR KNOW-HOW

ADD A NEW PRODUCTION LINE TO AN EXISTING PLANT

Our client developed a production process to be integrated into its metallurgical complex. CIMA+ presented several concepts during the FEL studies, among which the full gravity process, which was ultimately selected by the client.

The project being underway during the COVID-19 pandemic, CIMA+ used 3D scanning to carry out very detailed surveys without the need for on-site visits.

A minimum of equipment was installed outside the existing building. A modular shelter installed at height made it possible to keep the existing storage silo, to add a second one dedicated to the new product type and to install two magnetic separators. Two loading systems under the silos have also been planned for the transport by truck.

The new system has been seamlessly integrated to the production plant, which was kept in operation during the work.



REHABILITATION OF A RAILCAR TIPPER

The pinion and gear rim assembly of a railcar tipper were old and worn (30+ years) and the client wanted to extend their useful life.

In the context where technical support for this equipment was no longer provided, CIMA+ was called upon to reverse engineer the pinion-gear rim assembly and write the replacement and alignment procedure allowing the client to carry out the work autonomously if necessary.





OUR EXPERTISE AT YOUR SERVICE: A DEMONSTRATION OF OUR KNOW-HOW

PROTECTION AND CONTROL SYSTEMS FOR ELECTRIC ARC FURNACES

The furnaces had to be reconditioned, and the MV switchgear, circuit breakers and protective relays needed to be upgraded or replaced.

CIMA+ designed the entire power distribution for the furnaces, the medium voltage switchgear and the controls and protections, including remote trips. The FAT, SAT, POV and final commissioning were also entrusted

to CIMA+. All work was planned according to a very strict sequence as numerous simultaneous multidisciplinary work was being carried out in a plant in full operation.



EXTENDING THE LIFE OF CRITICAL PROCESSING EQUIPMENT IN A MINING COMPLEX

Since 2010, we have been rehabilitating critical equipment and corroded structures, thereby contributing to the safety of operations at a mining complex in Northern Québec.

With the discovery of new deposits, the mine wants to extend the life of its site by approximately 20 years.

Certain worn-out pieces of processing equipment require repair or replacement. CIMA+ has been involved in upgrading the concentrator for several years. We design and coordinate major repairs for tailings thickeners, flotation cells, heat exchangers, concentrate press supports, etc., during planned and emergency shutdowns, under strict budgets and timeframes.

CIMA+ is present for all semi-annual shutdowns to coordinate the work, inspect locations that are normally inaccessible and prioritize repairs to be carried out during upcoming stoppages.

Our engineering expertise is helping the mine preserve its aging equipment without compromising safety, and minimize unplanned production disruptions.



1 Before
2 After



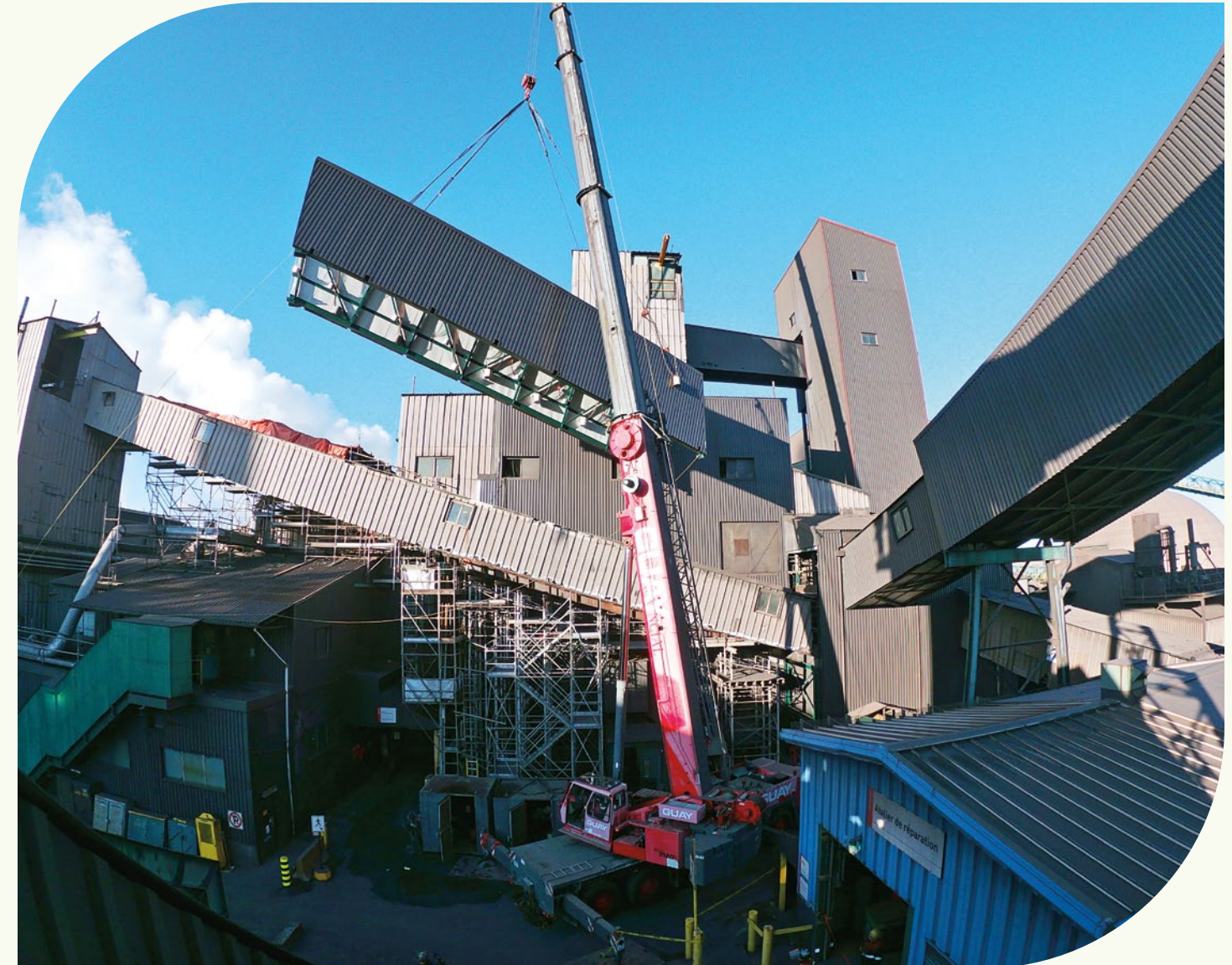
OUR EXPERTISE AT YOUR SERVICE: A DEMONSTRATION OF OUR KNOW-HOW

CRITICAL STRUCTURE ASSESSMENT PROGRAM

To prevent the aging of facilities in its industrial complex, the client asked CIMA+ to set up a five-year structural evaluation program, with planned inspections in order to prioritize remediation work.

To ensure consistency of the program, CIMA+ prepared guidelines for structural inspections and developed a defect classification table based on the client's risk matrix.

The five-year program was released in August 2020. Since then, more than thirty buildings and twenty conveyor galleries were inspected in one area of the complex alone, and thirty emergency structural repairs resulted from this audit and twelve projects were launched in the FEL1 phase. Further visits and visual inspections are underway in two different areas of the plant.





FOR MORE INFORMATION, CONTACT US:

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WE HAVE A LOCAL PRESENCE FROM COAST TO COAST, ALL ACROSS CANADA.

Baie-Comeau Beauce Bécancour Barrie Bowmanville Burlington Calgary – Airport Calgary – Downtown
Clareville Edmonton – Downtown Edmonton – West Gatineau Granby Guelph Halifax Kelowna Kitchener
Labrador City Laval Lévis London Longueuil Mississauga Montréal Oakville Ottawa Québec City Red Lake
Regina Rimouski Rivière-du-Loup Rouyn-Noranda Saguenay Saskatoon Sept-Îles Sherbrooke Sorel-Tracy
St John's Sudbury Terrace Thunder Bay Toronto Vancouver Victoria West Kootenays

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for **people**

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