



CAPABILITIES OVERVIEW



ISO 9001, 14001, 45001 Certified Company



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ABOUT US

Fortis Mining Engineering and Manufacturing is a privately owned company based out of Saskatoon, Saskatchewan that provides mining, engineering and manufacturing services to the mining and construction industries. Fortis has a global focus that offers contracting, subcontracting, and consulting services to a wide range of customers. Fortis is comprised of 6 divisions; Mining, Engineering, Manufacturing and Fabrication, Health and Safety, Equipment Testing and Recertification, and Mechanical Services.



ISO POLICIES AND ENVIRONMENTAL COMMITMENT

Fortis has achieved and maintained ISO 9001 Quality Management, 14001 Environmental Management, and 45001 Health and Safety Management Certifications. ISO benefits our customers by ensuring our products and services are safe, reliable, and meet industry standards. ISO helps Fortis to continuously improve our processes, which results in increased efficiencies that are passed along to our customers.

SAFETY

Fortis is committed to providing a Safe/Harassment free working environment for all personnel working under Fortis' Management: As such, Fortis has established a Health and Safety Program which guides the company in all its business.

Health and Safety Programs at Fortis focus on the following objectives:

- Prevention of all injuries, accidents, near misses, property damage and environmental releases.
- Compliance to all Occupational Health and Safety legislation.
- Compliance to our Customers Health and Safety Policies and Procedures.
- Ongoing training, education and mentorship of all employees.
- Continuous improvement through auditing and completing corrective actions in a timely fashion.





MINING AND INDUSTRIAL CONSTRUCTION

Fortis offers a wide range of services to the mining and construction industries; from longhole drilling and blasting, diamond drilling, mine development, labor contracts, shaft sinking, shaft rehab, alimaks/conventional raises, steel erection, piling, and concrete work to decommissioning. We perform site assessments and create safe work procedures to complete jobs, whether through a custom procedure, the design of a new piece of equipment or a combination of both. Fortis has access to the necessary engineering, manufacturing and testing facilities to complete this work in-house.

SERVICES AND CAPABILITIES

HARD ROCK MINING SERVICES

- Underground Constructions
- Mine Development
- Labor Contracts
- L.H. Drilling and Blasting
- Shaft Sinking
- Shaft Rehab
- Alimaks/Conventional Raises

DRILLING SERVICES

- Underground Coring
- Surface Coring

PROCEDURE DEVELOPMENT

- Mine Hoist Conveyance Replacement
- Mine Hoist Rope Change/Rope-Up
- Preventative Maintenance Planning

INSTALLATION/REPLACEMENT SERVICES

- Mine Hoist Conveyance Replacement
- Mine Hoist Rope Change/Rope-Up
- Friction/Drum Hoist and Sheave
- Hoist Rope Tensioning (Stage Hoists, Drum Hoists, Blair Hoists, Emergency Hoists, etc.)

EQUIPMENT SUPPLY AND SELECTION SUPPORT

- Mine Hoist Conveyance Replacement
- Mine Hoist Rope Change/Rope-Up
- Drill Rigs
- Haul Trucks
- Coring Rigs
- Long Hole Drills
- Pneumatic Top Hammer
- Hydraulic Jumbos

- Load Haul Dumps
- Jacklegs/Stopers

DESIGN AND SUPPLY

- Mine Hoist Rope Attachment
- Custom Mine Hoist Rope Change/Rope-Up Equipment

SUPPORT SERVICES

- Shaft/Hoist Commissioning
- Project Engineering
- General Project Management and Consulting
- Mine Shaft/Hoist Rope-related Emergency Response
- Mine Hoist Rope/Conveyance Troubleshooting
- Accident Remediation
- Hoist/Shaft Decommissioning



HARDROCK MINING SERVICES

Any mine development needs can be executed with our extensive fleet of Jumbo's, Bolters, LHD, Haul trucks, Jack leg/ stopers, and Longtoms. Our qualified operators are also capable of operating project site supplied equipment as required by the client

SERVICES AND CAPABILITIES

ALIMAKS/CONVENTIONAL RAISES

- Develop Ventilation Raises
- Escape Ways
- Manways From Level to Level
- Ore and Waste Passes
- Slots For L.H.

UNDERGROUND CONSTRUCTION

- Underground Shops
- Dewatering
- Vent Walls
- Paste Walls
- Shafts
- Bulkheads
- Ventilation Fan Systems
- Refuge Stations
- Hoists
- Mine Rehab

LABOR CONTRACTS

- Provide Equipment Operators (Underground and Surface)
- Conventional and Mechanized Miners (Jackleg/Stoper/Longtom Jumbo)
- Mechanical
- Mechanized and Conventional Raise Miners
- Construction Miners

L.H. DRILLING AND BLASTING

- Long Hole Drill and Bast
- Slot and Inverse Raises
- Utility and Services Holes
- Cable Bolt Installation
- Drill and Grout
- Pneumatic/ Hydraulic, DTH
- Top Hammer

SHAFT SINKING

- Bald Shafts
- Vent Shafts
- Production Shafts/ Cement Finish
- Loading Pockets

SHAFT REHAB

- Timber Set Installations/ Replacements
- Bald Shafts
- Cemented Shafts
- Loading Pockets
- Grizzlies
- Ore Passes/Waste Passes

SPECIALTY SERVICES

- Equipment Rentals.
- Engineering and Manufacturing
- Consulting



DRILLING SERVICES

Fortis' experienced mine technicians can safely and efficiently complete any above ground or underground drilling project. Our in house engineers, mechanics and fabrication team allows us to customize our drills to fit your site needs.

CABLE BOLT DRILLING

Fortis provides both the drilling and bolt installation for the convenience and time/cost savings of a single contractor. For cable bolt drilling, up-holes are drilled in the back of underground tunnels to install cables which are cemented and tensioned to help cover wide spread excavations or areas that require additional support.

CORING SERVICES

SURFACE CORING

- Deep Coring
- Versatile Equipment
- Closed Loop, Zero Discharge

UNDERGROUND CORING

- Offer Coring from BQ to PQ
- Include Double and Triple Tube
- Wireline and Conventional Coring
- Offer Accuracy Through Core Orientation, Single and Multi Shot and Gyro
- Pressure Grouting



MINE HOIST ROPE AND CONVEYANCE SERVICES

Fortis is world renowned as experts in mine hoist rope and conveyance handling. We have proudly offered our services and consulted mining clients around the world. Whether it be the Oyu Tolgoi mine in Mongolia or the Kabul gold mine in Africa or the potash mines of Saskatchewan.. You can expect Fortis to offer every service from procedure development, design and supply to install and replacement services. Fortis has a unique industry advantage by having it's sister company Northern Strands supplying all the necessary mine shaft wire rope and attachments.

PROCEDURE DEVELOPMENT

- Mine Hoist Conveyance Replacement
- Mine Hoist Rope Change/Rope-Up
- Preventative Maintenance Planning
- Engineered Lift Plan Development

INSTALLATION/REPLACEMENT SERVICES

- Mine Hoist Conveyance Replacement
- Mine Hoist Rope Change/Rope-Up
- Friction/Drum Hoist and Sheave
- Hoist Rope Tensioning (Stage Hoists, Drum Hoists, Blair Hoists, Emergency Hoists, etc.)

DESIGN AND SUPPLY

- Mine Hoist Rope Attachment Equipment
- Mine Hoist Conveyance
- Custom Mine Hoist Rope Change/Rope-Up Equipment

SUPPORT SERVICES

- Shaft/Hoist Commissioning
- Project Engineering
- General Project Management and Consulting
- Mine Shaft/Hoist Rope-related Emergency Response
- Mine Hoist Rope/Conveyance Troubleshooting
- Mine Shaft Accident Remediation
- Hoist/Shaft Decommissioning

RELATED WORK HISTORY – Procedure Development and Consulting

HATCH LTD. – MOSAIC ESTERHAZY K3 – SOUTH SHAFT ROPE-UP CONSULTING

The project scope entailed consulting with EPCM contractor Hatch Ltd. in development of the Mosaic Esterhazy K3 South Shaft Rope-Up Procedure for competitive bid and execution. Inclusive of equipment selection, rope-up methodology, safe work procedures, preliminary schedule, budgetary cost estimate, and pre-work/commissioning requirement overview. Project completed April 2020.

KIBALI GOLD (DEMOCRATIC REPUBLIC OF THE CONGO) – GUIDE ROPE REPLACEMENT PROCEDURE DEVELOPMENT

In late 2019 Fortis wrapped up a consulting project for Kibali Gold in the Democratic Republic of the Congo which included an assessment, walk-through, and develop a detailed guide rope replacement procedure including equipment requirements, procedure steps, sequence sketches, and safe work procedures. Fortis has completed the on-site visit and is currently in the stages of the detailed procedure and drawing development.

BHP (DMC MINING SERVICES) – JANSEN MINE SITE – ROPE CONSULTING

Fortis provides consulting and technical field services to DMC Mining Services as a subcontractor to BHP at their Jansen Mine site. Fortis personnel provide technical oversight and support for rope end cuts, rope sample preparation, and socketing on site.

HATCH LTD. – MOSAIC ESTERHAZY K3 – NORTH SHAFT ROPE-UP PROCEDURE DEVELOPMENT

In 2016, Fortis consulted to EPCM contractor Hatch Ltd. to develop the Mosaic Esterhazy K3 North Shaft Rope-Up Procedure for competitive bid and execution. Inclusive of equipment selection, rope-up methodology, safe work procedures, preliminary schedule, budgetary cost estimate, and pre-work/commissioning requirement overview.

RELATED WORK HISTORY – Rope Changes

NUTRIEN VANSCHOY POTASH OPERATIONS – HEAD ROPE CHANGE

In the spring of 2019, Nutrien contracted Fortis to assist in replacing all six (6) head ropes on the ground mounted hoist in their production shaft. The method to complete this rope change was to use a Timberland puller tensioner (bullwheel) at surface to install the new head ropes from surface.

NUTRIEN CORY – NO.2 GUIDE ROPE AND CHEESEWEIGHT REPLACEMENT

NUTRIEN CORY – NO.1 GUIDE ROPE AND PENDANT ROD REPLACEMENT

In August of 2018, Fortis was contracted by Nutrien Potash Cory Division to complete the planning and execution of both the No.2 shaft guide rope and cheeseweight replacement and the No.1 shaft guide rope and cheeseweight pendant rod replacement. For both projects Fortis' scope included supply of manpower and equipment to support the execution of the work.

MOSAIC ESTERHAZY K3 (AMC) – NORTH SHAFT HOIST ROPE REPLACEMENT

MOSAIC ESTERHAZY K3 (AMC) – SOUTH SHAFT HOIST ROPE REPLACEMENT

In May of 2018, Fortis was contracted by Associated Mining Construction (AMC) as a subcontractor at Mosaic Esterhazy K3 to complete the replacement of the north shaft hoist ropes. Fortis' scope included the supply of manpower and equipment (bullwheel tensioner, reeling machines, and pneumatic tuggers) to perform the work. Fortis was also responsible for development of the Inspection and Test Plan (ITP) and Quality Turnover Package for the scope of work.

In February 2018, Fortis completed the same scope of work for the south shaft hoist ropes.



RELATED WORK HISTORY

– Conveyance Replacements

MOSAIC COLONSAY – NO.2 SHAFT CONVEYANCE REPLACEMENT

During their 2019 summer shutdown, Mosaic contracted Fortis to complete the removal and replacement of their service cage. As Mosaic uses a tower mounted Koepe hoist in the service shaft, the method to replace the service cage was to chair the balance ropes at collar level as well as chairing and jacking the head ropes at the deflection sheave floor. An air tugger with multi-part line was then used to remove the old service cage and install the new one.



GENESIS ALKALI – GREEN RIVER WYOMING – NO.4 SHAFT SKIP REPLACEMENT

In October of 2018, Fortis was contracted by Genesis Alkali (formerly Tronox Alkali Corp.) to remove and replace one of the two skips at the No.4 shaft, which consists of a ground mounted hoist. In order to remove and replace the skip both the balance ropes needed to be chaired at collar level as well as banking the head ropes in the headframe. A reeving winch and mobile crane were used to remove and install the skip on surface. Once the new skip was installed, the balance ropes and head ropes were reattached. The scope of work also consisted of commissioning the skip. This encompassed trial runs in the shaft to confirm clearances, entry and stop points in the dump and loading pocket as well as tensioning of the head ropes.



AGRIUM VANSCOY POTASH OPERATIONS – SKIP CHANGE OUT

In the summer of 2012, Agrium Vanscoy Operations contracted Fortis to complete their production shaft skip change out. The scope of work was to remove the two existing 30-ton skips and replace them with two sacrificial 30-ton skips. The execution plan for this project included banking the existing head and balance ropes in the shaft to complete the removal and install of the skips. Fortis supplied the winches and all rigging that were used to remove and replace the skips. This project was completed safely and successfully within Agrium's summer shutdown.



In 2017, Fortis replaced the Skip Buckets for Agrium Vanscoy Operations. Including removal of both buckets, refurbishment of the east bucket, install of the new west bucket and re-install of the refurbished east bucket.

RELATED WORK HISTORY

– Rope-Up and Conveyance Installations

MOSAIC K3 SOUTH SHAFT ROPE UP

The fall of 2021 brings the completion of the new South Shaft for Mosaic at its K3 mine site near Esterhazy. Fortis working under Hatch was awarded the rope up and skip installation phase of the project. This scope of work included the installation of two 60 ton skips as well as the hoist ropes that will bring Potash from the underground mine up to surface to be milled. This is the second of two shaft rope ups that Fortis has successfully completed for the Mosaic K3 Mine.



JACOBS ENGINEERING GROUP – OYU TOLGOI (MONGOLIA) – SHAFT NO.2 ROPE-UP

Fortis has recently completed the successful rope-up of the production and service hoists at Shaft No.2 of the Oyu Tolgoi Mine Site in Mongolia, which was completed ahead of schedule and under budget. The No.2 shaft consists of two tower mounted Koepe hoists, which were roped up utilizing Siemag Tecberg multi-rope friction winch and Clamping Lifting Device (CLD).



PCS SCISSORS CREEK – ROPE-UP AND CAGE/COUNTERWEIGHT INSTALLATION

The scope of this project was to rope-up the new Koepe hoist at the Scissors Creek mine site. As this shaft was a bare shaft, the scope of work included the installation of all new guide ropes, balance ropes and head ropes along with the installation of a new cage and counterweight. One of PCS's 65,000 lbs. stage winches that was used in the sinking of the shaft was utilized as the primary winch to pull up the new ropes from the potash level. As the underground work area was accessed by going underground at shaft #2, followed by a 45-minute commute to the work area, staggered crew start times were utilized to have work being completed 24 hours per day. Fortis supplied all other equipment related to the project which included but not limited to hydraulic reeling machines, mobile reel handler unit, any and all rigging as well as a tractor trailer unit for the installation of the cage. The PCS Scissors Creek Project was successfully completed within the scheduled time in late fall of 2015.

HATCH LTD. – MOSAIC ESTERHAZY K3 – NORTH SHAFT ROPE-UP

In early March of 2019 Fortis had completed execution and commissioning of the Mosaic Esterhazy K3 North Shaft Rope-Up; including supply of engineering, manpower, and equipment. The project entailed rope-up of a Siemag-Tecberg Blair Hoist and installation of an FLSmidth Service Cage in the service compartment. As well as rope-up of a Siemag-Tecberg Koepe Hoist and installation of two 60T production skips in the production compartment.



RELATED WORK HISTORY – Shaft Conversions with Structural Component

PCS ROCANVILLE – NO.2 SHAFT DE-ROPE, SHAFT STEEL INSTALLATION, ROPE-UP AND PRODUCTION SKIP INSTALLATION

In 2016 Fortis was contracted by PCS Rocanville to supply manpower and equipment to remove the existing mine hoist ropes, replace existing shaft bottom steel and tie in to new shaft tower structure (as part of the conversion from a mine service shaft to mine production shaft), install new production shaft hoist ropes, and install and commission new 50 Ton production skips.

CAMECO CIGAR LAKE – SHAFT FURNISHING, CONVEYANCE INSTALL AND ROPE INSTALLATION

In 2012/2013 Fortis was contracted by DMC Mining to execute the furnishing of the No.2 shaft at the Cameco Cigar Lake mine. This large-scale project included the pouring of a 480m concrete divider wall, installation of shaft services such as electrical cable, water lines, high pressure slurry lines as well steel sets and ridged guides in the shaft. Along with the furnishing scope of work, was to remove the existing Galloway system in the shaft and replace it with a service cage and counterweight for Cameco's day to day operations. This scope included the replacement of ropes on the double drum hoist along with the installation of a service cage and counterweight.

RELATED WORK HISTORY – De-Rope, Rope-Up and Conveyance Installation

TRONOX ALKALI – GREEN RIVER WYOMING NO.4 SHAFT ROPE AND SKIP REPLACEMENT

In May of 2017, Fortis was contracted by Tronox Alkali Corp. in Wyoming to complete a head rope replacement and skip replacement in their No.4 shaft during a long wall shutdown. Phase one of this project was to remove the four existing head ropes from their ground mounted hoist. This consisted of chairing the three balance ropes at the collar level on surface as well as banking the existing skip in the headframe. A surface winch was used to lower the old ropes underground. A reeling machine was set up at the mining level to simultaneously reel the ropes up onto empty reels. Once all old ropes were removed from the shaft, the upper tails were removed from around the ground mounted hoist.

Phase two was to remove the existing skip from the headframe. The surface winch along with a mobile crane were used to remove the skip from the headframe. The new skip was installed using the same method as removal. Phase three consisted of the installation of the four new head ropes. These ropes were raised up from underground using the surface winch to hoist them up. Once the new head ropes were installed, the balance ropes were reconnected, and the new skip was made operational. The project was completed within the scheduled shutdown period.



AGRIUM VANSKOY POTASH OPERATIONS (AMC) – DE-ROPE, ROPE-UP AND SKIP CHANGE OUT

In the summer of 2014 Fortis was subcontracted by Associated Mining Construction (AMC) to complete the rope installation phase of Agrium's production shafts new hoist system install. The first phase of the scope of work for this project was to de-rope the existing balance ropes and head ropes from the Koepe hoist as well as remove the existing 30-ton skips. This was in preparation for the rope-up of the new six rope ground mounted hoist. Once the hoist was de-roped, Fortis then assisted in the removal of the koepe hoist from the headframe. To start the second phase of the project Fortis repositioned the guide ropes and cheeseweights in the shaft to accommodate the new larger 50 ton skips. Balance ropes were installed followed by the installation of the six head ropes. For this project Fortis supplied a 40,000 lbs. winch that served several functions on the project. Fortis is proud to have safely and successfully completed this project in Jan of 2015 for the Vault Project and Agrium Vanscoy.

PCS CORY – ROPE-UP AND SKIP CHANGE OUT

In the summer of 2010, Fortis was contracted by PCS Cory to complete their rope-up and skip change out during their summer shutdown. The first phase of the scope of work included removing the existing balance ropes and head ropes and the removal of the existing 30 ton skips in the production shaft. Once de-rope was complete, the second phase of work included the install of new balance ropes, head ropes and the install of 2 new 50 ton skips. The winches and all rigging that were required for the project were supplied by Fortis. The banking beams that were necessary for the balance ropes were also engineered and fabricated by Fortis. This project was completed safely and successfully in the scheduled shutdown period.

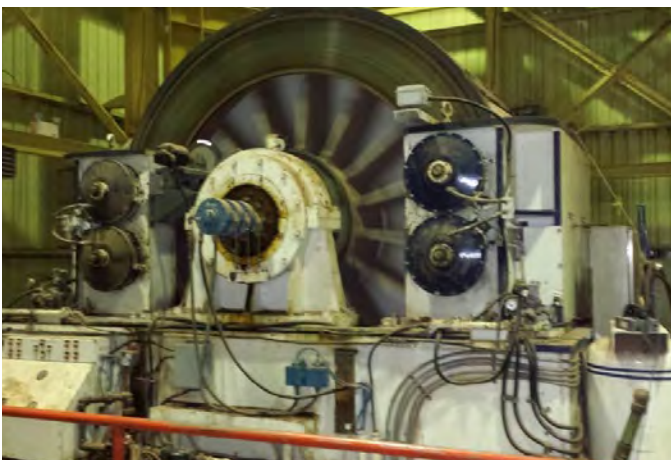
RELATED WORK HISTORY – Additional Projects

- Nutrien Vanscoy Balance Rope Changes – Ongoing
- Nutrien Vanscoy Guide Rope Changes – Ongoing
- Mosaic Colonsay Balance Rope Changes – 2020
- Mosaic Colonsay Guide Rope Changes – 2019
- Mosaic K2 Head Rope Replacement Consultation – 2016
- Mosaic Colonsay Counterweight Replacement – 2016
- PCS Cory Guide Rope Replacement – 2015
- Mosaic K2 Guide Rope and Head Rope Replacement Consultation – 2015
- Mosaic K2 Head Rope Replacement Consultation – 2013
- Mosaic Colonsay Guide Rope Replacement – 2013
- PCS Lanigan Cage and Counterweight Replacement – 2013
- Agrium Head Rope Replacement – 2011

RELATED WORK HISTORY – Hoist Removals, Installations and Commissioning

PCS SCISSORS CREEK AND ROCANVILLE SHAFT 2 – REEVING HOIST INSTALLATION

Fortis (as part of NSGC) removed 100,000lb Stage Hoist from PCS Lanigan and Relocated/Re-Purposed as Reeving Hoist for PCS Scissors Creek Rope Up. Once PCS Scissors Creek Rope Up was complete, the Reeving Hoist was removed and relocated to PCS Rocanville No.2 Shaft to support the De-Rope of the existing hoist and Rope up of the new Friction Hoist. Fortis also removed the existing friction hoist from the Rocanville No.2 shaft for the installation of the new ABB Friction Hoist. Fortis also installed new liner blocks on the new ABB hoist following the installation.





UNDERGROUND CONSTRUCTION AND DEVELOPMENT

Fortis offers a full range of underground mine construction and development services. Our mine construction experience ranges from mine development and operations to mine decommissioning. past projects include ground control, ground rehabilitation, conveyor installations, removals as well as overhead crane installation, crane repair, crane demolition. Our team is comprised of highly skilled construction miners, operators, project managers, engineers, and experienced mining staff. We have experience in developing jobsite procedures and safe work plans. Fortis has managed all types of projects ranging from small to large complex projects.

PROJECTS:

NUTRIEN ROCANVILLE EAST ORE STORAGE BINS

In the summer of 2021, Fortis was awarded a large underground project by Nutrien Rocanville. This project consists of erecting three ore storage bins as well as one surge bin in this underground Potash mine. Fortis began mobilizing for the project in late summer and by early fall construction had begun to take place on this 9 month project. As the demand for potash increases, and the mine continues to expand additional underground storage is required to keep up with production.



NUTRIEN VANSKOY UNDERGROUND DEVELOPMENT AND REHABILITATION

Fortis has recently partnered with Thoar Mining on an underground rehabilitation project for the Nutrien Vanscoy mine. Fortis and THOAR Mining were awarded 8 underground capital projects including underground rehab, development, and mainline conveyor installation. This project was awarded to Fortis and Thoar in the fall of 2021 and have been hiring additional personnel to execute multiple rehab projects over the next seven months.

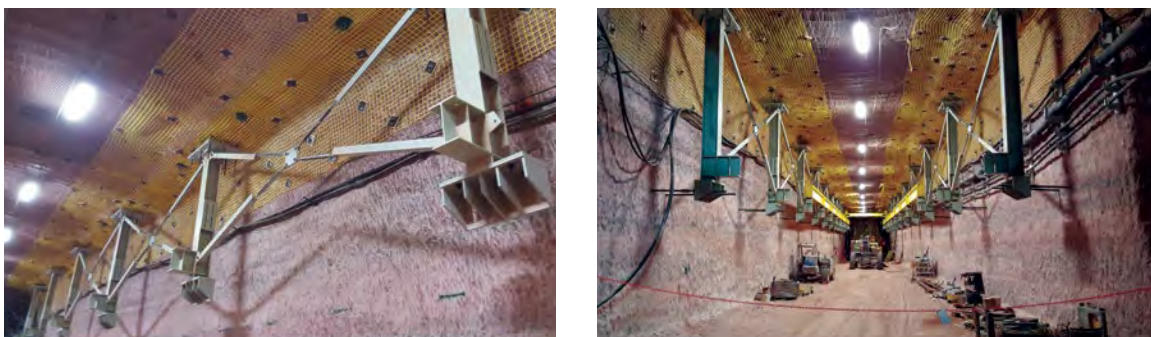


MOSAIC COLONSAY – S112 NO.5 BELTLINE, W137 AND S36 CONVEYOR STRUCTURE UPGRADE

Fortis was contracted by Mosaic Colonsay to complete the upgrade of the S112 No.5 beltline. This project included the removal of the existing 48” conveyor belt and structure followed by the installation of 60” structure with 54” conveyor belt. This project was completed on schedule.

MOSAIC COLONSAY – NO. 2 SHAFT OVERHEAD CRANE REPLACEMENT

Fortis was contracted by Mosaic to dismantle, remove and replace the existing 30/10T overhead crane underground at the No.2 Shaft station of the Mosaic Potash Colonsay mine site. This work entailed the controlled demolition of the existing overhead bridge crane and accompanying structure. Once removed the walls of the underground shaft station were excavated to expand the width of the shaft station/staging area. Upon completion of the excavation, Fortis installed a new 200 foot long back mounted rail system, new bridge assembly complete with a new 30/10T crane assemblies. The installation included supporting the manufacturer on site and completing a CSA B167 compliant load test of the new bridge crane.



MOSAIC COLONSAY - FUEL STORAGE RELOCATION

Fortis completed the Fuel Storage Relocation Project at Mosaic Colonsay. This included the installation of: East and West Fire Doors in Fuel and Lube Bay. The Fire Suppression System, heat detectors, strobe lights/horn combo, control system panels, fans and ventilation ducting, including door modifications to pass ducting through.



MOSAIC COLONSAY - UNDERGROUND CONVEYOR UPGRADE INSTALLATION

The scope of work included: demolition and removal of the existing conveyor; mucking, excavation, rehabilitation and rock bolting; installation of structural steel, mechanical equipment and all conveyor components. Fortis successfully completed the scope of work ahead of its scheduled completion date with no safety incidents. Fortis is proud of the quality of work it provided and its timely completion.



MOSAIC COMPANY, COLONSAY MINE - UNDERGROUND BIN REFURBISHMENT

In this project Fortis leveled the bin structure and replaced the suspension cables that supported the bin. The new cables were equipped with load cells for uniform and controlled tensioning. The load cells will allow for close monitoring of the loading on the cables. Fortis built a cat walk to enable the maintenance personnel to check the cables and the load cells. The maintenance personnel can visually inspect each cable and load cell and make adjustments as required.



NUTRIEN, CORY DIVISION - REPAIR OF UNDERGROUND RAW ORE BINS

Fortis was contracted to complete repairs on one of the underground raw ore bins. This 500 ton capacity bin needed to be leveled due to ground movement in the mine. Fortis utilized hydraulic jacks to remove and replace shims as required to level the bin structure.

MINE SHAFT MAINTENANCE AND REPAIR



Fortis specializes in all aspects of mine shaft maintenance and repair and outfitting. Our experience ranges from shaft development through to service installations. Our team has worked on a variety of shaft rehabilitation projects that include concrete liner repair, ground rehabilitation, shaft steel installation and repairs and shaft services installation and removal. We have successfully completed numerous shaft electrical cable installations ranging from communication cable up to 25kVA shaft feeder cables. Fortis is well known for our mine shaft knowledge and expertise. We routinely develop safe and effective mine shaft procedures and plans for mines throughout the world.

Fortis has previously completed the design, fabrication and testing of several styles of shaft brackets for various shaft services. Fortis has facilitated electrical cable testing with shaft bracket assemblies including pre-testing of electrical cables, testing under load, and post-testing cables to ensure securing methods do not impact functionality of the services. Fortis has an in-house horizontal test bed capable of pulling up to 400,000lbs for non-destructive and destructive load testing.

PROJECTS:

PCS SCISSORS CREEK – SHAFT BRACKET AND FEEDER CABLE

Fortis supplied all manpower and equipment to install new 15kv Prysmian Airguard 350MCM shaft feeder cables. It was Installed from a cable reel mounted in the service cage bail as hoisted from underground to surface installing in CMP Zenith cable cleats on custom designed shaft brackets along the way.



MOSAIC ESTERHAZY K1

All manpower and equipment to install shaft brackets/wedges and (2x) 15kv Prysmian Airguard 350 MCM shaft feeder cables were supplied by Fortis. We did a top-Down installation of a feeder cable utilizing Fortis' 44,000lb winch and custom designed Reel Trailer and Cable Lowering Sheave Stand.



MCARTHUR RIVER

Fortis was commissioned to install 2 feeder cables, 2 ground cables, 2 fiber optic cable down two 8" boreholes 500 + meters deep. These cables feed the underground substation. Fortis custom designed and tested cable clamps which combined and supported the sacrificial support cable, fiber optic cable, ground conductor and 25Kv Verlock feeder cable. Cable assembly was suspended by a Northern Strands 20T Suspension Gland on a Fortis custom designed Sheave Stand Assembly which also included (3x) terminations for the internal tensile support members of the Verlock feeder cable. The cable bending radius's had to be carefully accommodated. Also a suspended load capability of 30,000 lbs had to be incorporated into the equipment design. As a result Fortis designed and built a wire rope sheave stand assembly to perform the task. See picture below. The job went very well, it was completed safely and ahead of schedule.



ALTAGAS, FORREST KERR

Supplied manpower and equipment to assist with install of 54 electrical cables in bus shaft at Forrest Kerr project. Performed a top-down installation utilizing pneumatic winch and custom reel trailer and sheave stand. All engineering and installation methodology developed by Fortis.



MOSAIC COLONSAY

Fortis provided all manpower and equipment to install (2x) 13.8kv shaft feeder cables and associated instrumentation cables in No.2 shaft. Fortis executed a top-Down installation utilizing Fortis' 44,000lb winch, custom reel trailer and sheave stand. All engineering and installation methodology developed by Fortis.



NUTRIEN (AGRIUM) VANSKOY POTASH OPERATIONS – SHAFT LINER REMEDIATION

Fortis has previously executed a very similar shaft liner remediation project at the Agrium Vanscoy Potash Operations mine site in the No.2 (Service) Shaft from approximately October 2013 through January 2015. The project was successfully executed over approximately 15 months with no recordable incidents. The methodology for the Agrium Shaft Liner Remediation included the design and fabrication of a shaft work deck, installation of ground support, installation of drain pipes and flow meters, controlled demolition of existing shaft liner, design and fabrication of a concrete delivery system, and forming and pouring of concrete in the repair area executed similarly to the proposed execution methodology for PCS Allan Production Shaft Liner Remediation project. Through the execution of the Agrium shaft liner remediation project Fortis has proven an ability to efficiently and collaboratively work with Alan Auld as a design engineer on a similar project.

NUTRIEN, ALLAN DIVISION

Fortis completed shaft remediation on the concrete liner in #2 Shaft. Over time water began eroding the ground behind the concrete liner. This erosion then put pressure on the liner and began to push it out into the shaft. Fortis installed mine grid mesh and steel strapping to temporarily secure the liner until a long term plan is developed to repair the concrete liner.

NUTRIEN, ALLAN DIVISION #2 SHAFT

Fortis successfully completed the loading pocket steel Installation. The scope of work included the supply and installation of tower steel from the loading pocket up to the potash level.

MOSAIC COMPANY, COLONSAY MINE - #2 SHAFT UPPER SHAFT STEEL REPLACEMENT

Fortis was commissioned to remove and replace the structural tower steel. The project was time critical as this shaft is the service shaft which transports personnel and materials underground. Fortis successfully completed this project on time so Mosaic could return to their regularly scheduled cage times.

NUTRIEN, LANIGAN DIVISION - FEEDER CABLES



Fortis was contracted to install six 25kV Feeder Cables in the Service Shaft. Fortis successfully completed the installation of three cables in 2011 and the remaining three in July 2012. Fortis utilizes a cross head with integrated camera to guide the cable down the shaft to the lower drift level at the bottom of the shaft. The cross head is assembled in the shaft on top of the skip or cage. Camera provides live video of the cable being lowered down the shaft.





INDUSTRIAL CONSTRUCTION

Our employees are highly skilled in a broad variety of construction activities. Fortis has the versatility to mobilize a single crew for multiple facets of work. This allows us to select the workers with the right skill set for the job. Our team's skill set ranges from piling and concrete work to structural steel installation, demolition and rehabilitation. We have highly trained riggers and hoist operators that have the capacity and expertise needed to supply, install and commission hoist devices. We have experience developing jobsite procedures and lifting plans.

PROJECTS:

SASKPOWER POPLAR RIVER POWER STATION (PRPS) - ELEVATOR STRUCTURAL STEEL SUPPLY AND INSTALLATION

Fortis was contracted to complete the demolition of exiting stairwells and electrical components, fabrication and installation of new structural steel, supply and installation of new electrical, and supply and installation of new cladding for the Poplar River Power Station Manlift Replacement. Fortis has obtained crucial working experience with an installation very similar to the Spy Hill Power Station Elevator project through the execution of the PRPS Manlift Replacement. Fortis worked cooperatively with SaskPower, subcontractors and the elevator installation contractor to successfully complete the project and turn over the new system to the power plant.

SASKPOWER POPLAR RIVER POWER STATION - FLU GAS EMISSIONS STACK HIGH ANGLE RESCUE LUG

Fortis was contracted by SaskPower to complete the installation of high angle rescue lugs and a jib crane on the Flue Gas Emissions Stack at the Poplar River Power Station. The High Angle Rescue lugs were WINSAFE 5T lugs welded onto backing plates which were mounted via Hilti resin anchors in sets of 4 at each of the landings up the ~400' stack. The project also included the installation of a 1/2T jib crane at the door access platform of the stack (~300' from ground level) which required load testing as per CSA B167. During the performance of the work some extras and structural deficiencies were noted on the stack which Fortis was contracted to remedy under a change order to the original contract.

SASKPOWER POPLAR RIVER POWER STATION - SPILL BOOM DESIGN/SUPPLY/ INSTALLATION

Fortis designed, supplied, and installed a permanent spill boom system for the CW Canal at the Poplar River Power Station. Design was completed for a Permanent Harbour Boom (Subcontracted to Versatech), Tidal Compensator Assemblies (Fortis Engineering) and Spill Management Stair Assembly (Fortis Engineering). Installation of the permanent spill boom, tidal compensator and stair assembly were completed on site by Fortis personnel. Fortis managed the subcontractors for the installation and surveying of the Helical Screw Piles.



SASKPOWER E.B. CAMPBELL DAM - SPILL BOOM DESIGN/SUPPLY/ INSTALLATION

Fortis was contracted by SaskPower for the removal of an existing safety boom and the supply and installation of a new water safety boom system for E.B. Campbell Dam. As General Contractor, Fortis constructed a laydown area along the South shore of the spillway and set sail to a month-long project alongside several subcontractors. Early milestone tasks consisted of placing large, floating barge sections into the water and building an access platform for a 55T RT Crane to be positioned onto the H-Barge.

The new safety boom system consisted of 20,000 lb. 5'x5' concrete anchor blocks placed underwater via the 55T RT Crane atop the floating barges and a diving crew for safe handling/lowering and rigging. These concrete anchors were the foundation for the 24" diameter x 20' and 40' steel pipe pontoons (painted to spec and filled with EPS Foam for floatation) positioned and anchored across the water from South shore to North shore, near the E.B. Campbell Spillway. A 24" x 30' vertical steel pile was driven into the ground along the North dam and utilized as tie-off/anchorage for the steel safety pontoons.





SASKPOWER EB CAMPBELL - AIR TANK RECEIVER PLATFORMS

Fortis designed, supplied, and installed new structural steel walkways with handrail and ladders for maintenance access to six (6) separate Air Tank Receiver units within the EB Campbell Hydropower Station. Fortis facilitated all hot-work permitting requirements as the work mainly consisted of cutting/torching existing steel structure to be replaced with new via welding services.

SASKPOWER SHAND POWER STATION - LIFTING LUG AND MONORAIL REMEDIATION

Fortis was contracted to complete the fabrication, installation, and commissioning of a new 10T monorail as well as the replacement of a 10T Chain Hoist on an existing 10T Monorail. The front end work included the shop fabrication of a new curved 10T monorail, procurement of (2x) new 10T Chain Hoists. Once materials were delivered to site Fortis installed the new 10T monorail and accompanying structural steel reinforcements. Once the monorail was installed to specification Fortis installed the (2x) new 10T Chain hoists and subcontracted the electrical installations and commissioning of the new hoists. Once the hoists were installed on the monorails the new and existing monorails/hoists were load tested as per CSA B167 standards with engineer stamped test reports issued to SaskPower for their records.



STRUCTURAL DEMOLITION / EQUIPMENT SALVAGING PROJECT

Fortis was contracted for the safe removal/demolition of production facility processing equipment and surrounding steel structures and concrete foundations. Fortis was responsible for salvaging tanks and centrifuges for re-sale to a third-party buyer.

Safe load handling via mobile crane and small telehandler of all material and equipment was paramount to the success of the project.



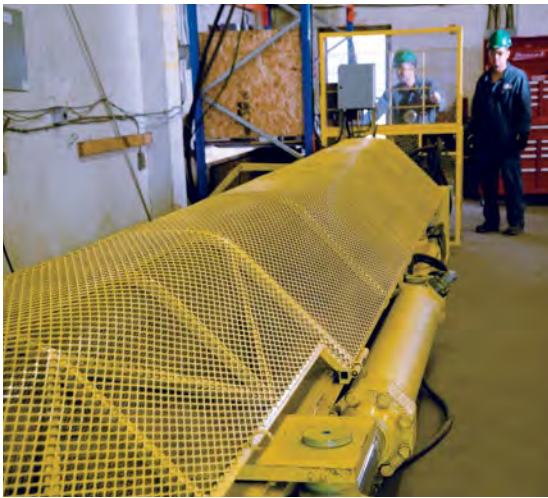
NUTRIEN, ALLAN DIVISION - Headframe Structural Bracing

Fortis completed the A-Frame Leg Bracing Project on the #2 headframe at PCS Allan. The scope of this project was to install four 75 foot long cylindrical braces on the existing A-frame legs. The use of two cranes and a man lift were utilized to safely complete these critical lifts. Working around weather delays, this project was successfully completed.

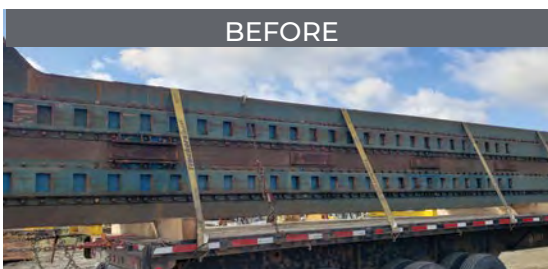
EQUIPMENT TESTING AND RECERTIFICATION

WILL YOUR EQUIPMENT PERFORM AS RATED?

We have the ability to repair, restore and recertify many types of equipment, such as slings, D-plates and spreader beams. Our horizontal test bed is capable of pulling up to 400,000 lbs. We are continually expanding our recertification capacities and abilities.



- Pull testing
- Pull testing to destruction
- Rigging
- Research and development
- Proof loading
- Third-party non-destructive testing
- Annual recertification
- Material baskets
- Lifting beams
- Personnel carriers
- Equipment refurbishment and recertification



Conveyance rebuilt/refurbished



Mining wire rope attachments refurbished and recertified



ENGINEERING

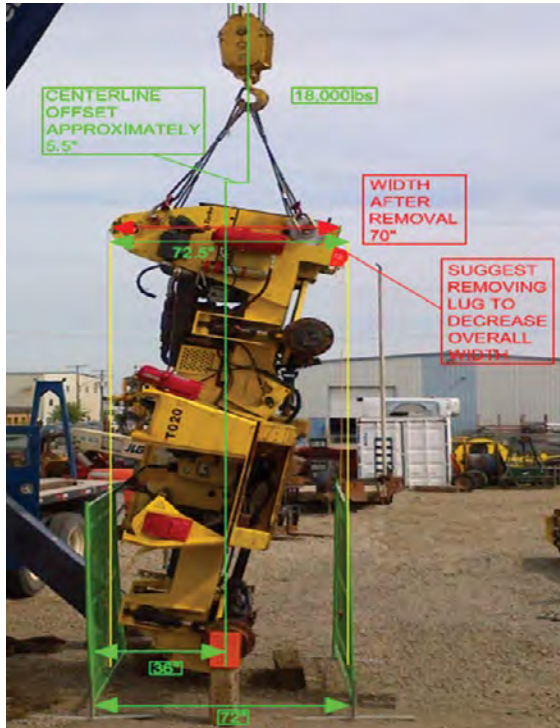
Fortis' Engineering Services team consists of engineers and technicians that are not only strong in fundamental sciences, but are also experienced in practical solutions. Our design and consulting teams offer services in mechanical and mining engineering. Many of the engineered products sold by the other Divisions are built inhouse. This enables us to provide a one-stop solution for our customers. From customer concept, design, build, test, install, use, and maintain. Fortis can provide technical expertise through the entire process.

SERVICES AND CAPABILITIES

- Structural Design and Detailing
- Mechanical Design and Detailing
- Construction Drawings and Methodologies
- On-site Engineering Support
- Engineered Lift Plans
- Shop Drawings
- Custom Designs
- Jib Cranes, Monorails, Gantry
- Personnel Baskets
- Emergency Egress Shaft Conveyance
- Material Handling Equipment
- Reel Handling Equipment
- Muck and Concrete Bucket Design
- Galloway Design
- Specialty Shaft Rope-up Tools and Equipment
- Rope Attachments and Cheese Weights



ENGINEERED LIFT PLANNING



Fortis Mining Engineering and Manufacturing has an abundance of experience in providing lift studies and engineered lift plans for the Potash Mines of Saskatchewan, with recent experience including development of lowering procedures with Blair Hoists and Sinking Winches.

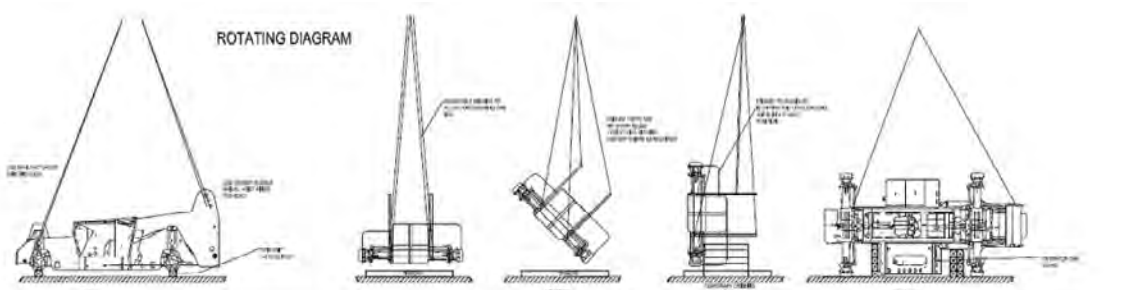
Fortis has developed a test lifting criteria for components which confirms that each piece of equipment hangs as per design within the individual shaft parameters which virtually eliminates rigging issues during shaft lowering.

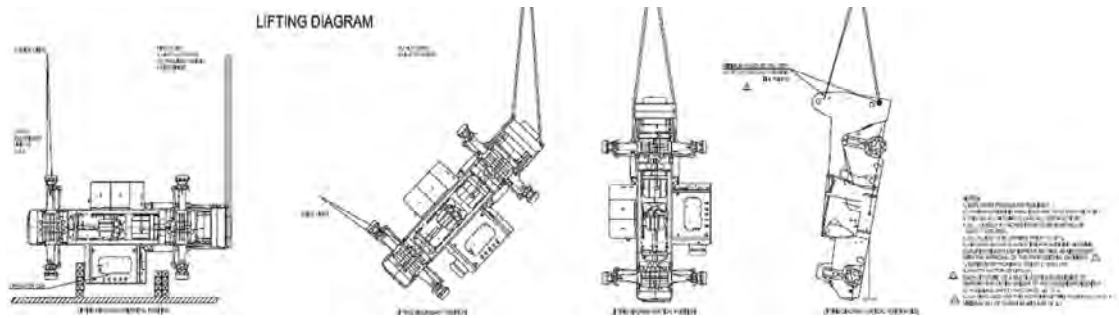
Fortis rigging plans utilize our underground experience to maximize the capabilities of the shaft profile and hoist lifting capabilities.

Reduction in disassembly of underground equipment has saved clients time and money.

Comprehensive lowering methodologies typically include a site specific material hoisting basket design that is compatible with the sinking arrangement if a cage is not available. This allows 'light loads' on pallets, bundles, or crates to be safely transported underground with speed and consistency.

Fortis is an industry leader in the development of critical lift plans for the mining and construction industries.





INNOVATION

Fortis has and always will be an industry leader in innovation. Whether it is a tangible piece of gear, or a process or procedure, we engineer and manufacture with the goal of improving safety, efficiency, and cost effectiveness. If there is a need for it, Fortis will design and build it. We use the products we build!



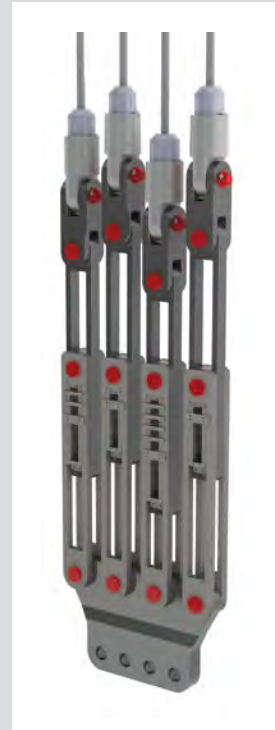
Pillow Block



Socketing Stand



Material Basket



Hydraulic Linkage



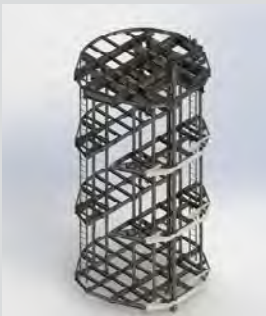
Cable Clamp



Grout Bucket



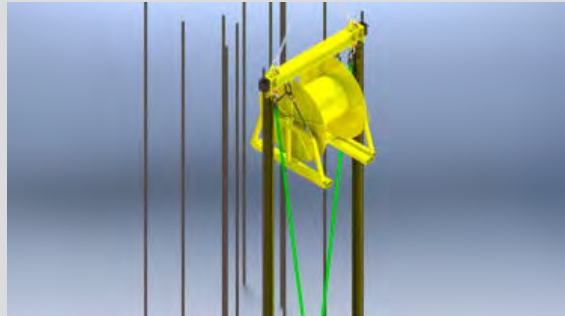
Admix Platform



Galloway



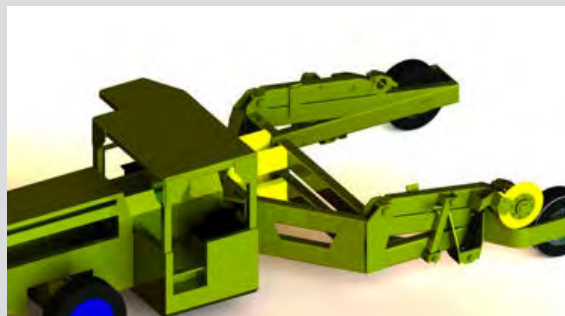
Gland Stand



ECR with Spreader Bar



Spreader Beam



Custom Mobile Reel handlers



FABRICATION

Fortis' Manufacturing facilities offer machining and welding services as part of the entire fabrication process. Fortis machines many of the custom mining attachments required by our clients including chaseblocks, cheeseweights, swivels, and sockets. Fortis' welding shop has fabricated numerous custom products and equipment for customers as well as equipment that is used by Fortis, including safety barriers and reeling machines. With the access to a manufacturing shop and support from our engineering department, we can design and build solutions for our customer's needs.

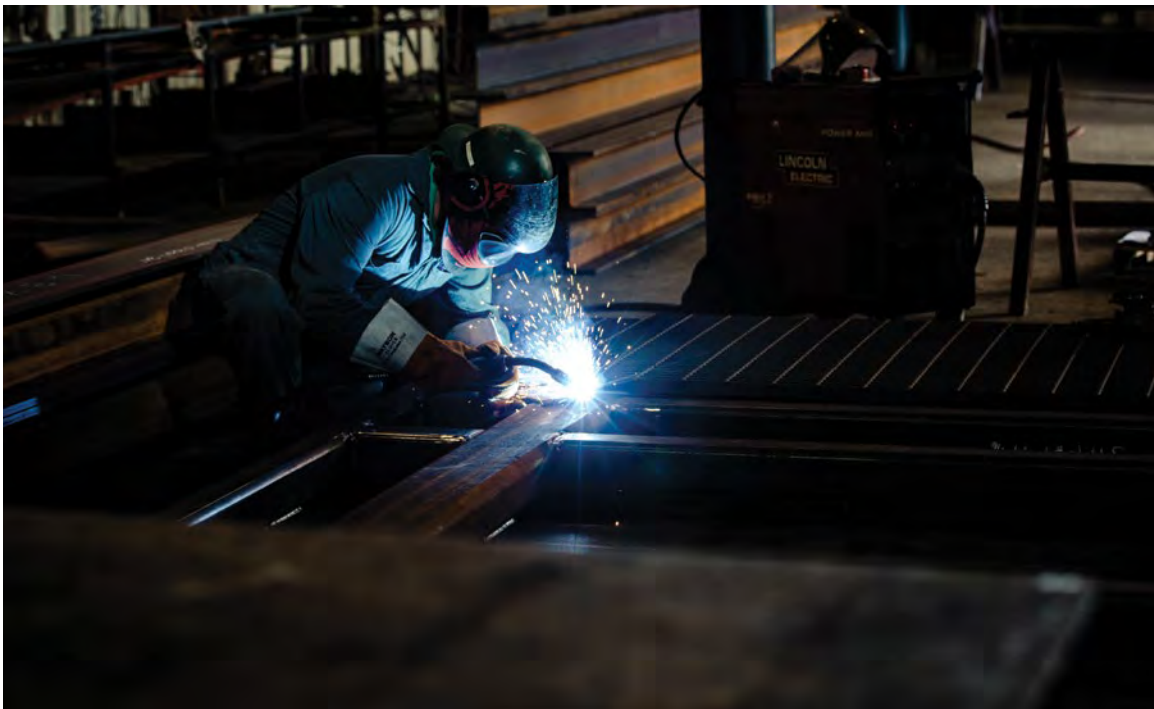
CAPABILITIES AND SERVICES

- CWB Certified in Steel and Stainless
- CWB Certified Journey-Person Welders and Fabricators
- CEB Level 1 Weld Inspectors
- Journey-Person Machinists
- Machining Steel, Stainless, Iron, Brass, Bronze, and Plastics
- Wide Range of Inventory Sizes for 4140, 1018, and Aluminum
- Custom Fabrication
- Custom Equipment Modifications
- Custom Sheaves, Pins, Bushings
- Custom Hoisting and Rigging Products
- Equipment Recertification
- 400,000 lb Pull Test Bed



FORTIS HAS CUSTOM FABRICATED:

- Work Platforms
- Head Covers and Protective Structures
- Certified ROPS and FOPS
- Bins, Tanks, and Chutes
- Handrail and Barricading
- Reel Trailer and Reeling Machines
- Personnel Carriers and Baskets
- Concrete and Muck Buckets
- Monorails
- Shaft Steel
- Rope Attachments
- Cheeseweights
- Emergency Man Capsule
- Explosive Cabinet
- Chaining Beams
- Spreader Bars
- Custom Rope-up Equipment





Deflection Sheave Assembly



Fork Lift Lifting Boom



Reel Trailer



Structural Steel



Gin Car



Concrete Bucket



Muck Bucket



Material Basket



ROPS Cage



Monorail



Underground Ceiling Anchor



High Pressure Brine Tank platform



High Pressure Brine Tank (inside)



Testing of Material Basket



Construction Barricade



Custom Mobile Reel handlers



Ore Bin



Tiled Chute



Explosives Cabinet



Emergency Man Capsule

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

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The logo for Fortis Mining Engineering Manufacturing. It features a stylized circular icon on the left, followed by the word "Fortis" in a large, bold, sans-serif font. To the right of "Fortis" is a vertical line, followed by the words "Mining", "Engineering", and "Manufacturing" stacked vertically in a smaller, bold, sans-serif font.

Fortis | Mining Engineering Manufacturing

ISO 9001, 14001, 45001 Certified Company

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