Supporting Your Success.

Mining Infrastructure

- Across the Site
- ► At the Plant
- And Underground



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EFFICIENT INFRASTRUCTURE SOLUTIONS TO KEEP YOU COMPETITIVE.



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Innovative thinking has been the cornerstone of our success for over 55 years. As industry leaders, AIL Mining and The AIL Group of Companies are committed to product research and development, with solutions that are endorsed by engineers around the world.

Turn-key, value engineered solutions with a difference.

Staying competitive in today's economic climate means building in efficiencies from the ground up. That's why many of the world's most successful mines and quarries use efficient infrastructure solutions from AIL Mining. We can help you save time and money in providing safe, practical work sites for your employees. By design, our custom solutions are easy to ship and install with minimal equipment and local labour, making them ideal for remote locations — even in the Arctic. Plus, with over 55 years of working closely with the global mining industry, our Technical Sales and Engineering teams are well-poised to deliver turn-key, value engineered solutions with a difference. AIL professionals will guide you through every phase of your project — assessment, design, specification, assembly, backfilling and testing — to ensure successful project outcomes.

AlL Mining's infrastructure solutions have been adding value to the world's most successful mine sites for over 55 years.



Contact an AIL Mining Technical Sales Representative. In Canada: 1-877-245-7473 International: +1-778-355-7000



We support sustainable mine site development

AlL Mining recognizes the interdependence between social, environmental and economic sustainability, and we are committed to developing industry-leading sustainable infrastructure through:



Offering low global-warming potential solutions

- > Steel infrastructure has a substantially lower life cycle carbon footprint than concrete
- ► Less energy is used in the production and shipping of steel infrastructure than concrete
- Our manufacturing facilities are substantially solar powered and The AIL Group is moving forward on our goal to be carbon neutral by 2050



Increasing the amount of materials which are reusable/recyclable

- ► Steel is the world's most recycled material* and many of our solutions have high recycled content
- > Zinc used in galvanizing is a naturally occurring material and is 100% recyclable**

Reducing negative biodiversity impacts during construction and in-service, and regenerating the environment, where possible

- ▶ Wide span, open bottom structures reduce stream impacts and washout concerns
- Wildlife crossings and fish passages help maintain movement in habitat
- ▶ Reduced need for cast-in-place concrete on site
- Less effort to decommission steel infrastructure than concrete
- Some structures can be disassembled and reused

Understanding and improving our customers' life cycle costs

Steel infrastructure provides significant savings on overall construction and life cycle maintenance, while still providing the same functionality as concrete

Providing solutions which minimize road closures during construction and while in service

- Steel infrastructure can be built in significantly less time than concrete, reducing disruption time, detours and construction schedules
- Steel structures require virtually no maintenance
- > They are also more resilient to settlement, seismic events and climate change's extreme weather

Providing infrastructure solutions which increase user safety

- ▶ Buried metal bridge crossings typically provide wider, safer road widths
- ▶ Underground structures can be built from one side with THE EDGE Four-Flange Structural Liner

Making positive contributions to our communities

- Steel infrastructure uses non-specialized equipment and labour available through local contractors
- ► It also allows for optimal use of locally available fill material



Learn more about The AIL Group's Sustainability Policy

www.ailmining.com/the-ail-group-sustainability-policy-statement-of-commitment/

*Reference: www.aisc.org **Reference: https://galvanizeit.org/hot-dip-galvanizing/is-galvanizing-sustainable/hdg-environmental-advantages

Statement to be and





Ultra•Cor[®] creates the world's largest and strongest structures.

With the introduction of Ultra•Cor®, AIL has taken engineered infrastructure to new dimensions in capability and performance. As the world's deepest corrugation profile, Ultra•Cor® combines all the advantages of lightweight construction with previously unheard-of strength and durability to create the largest and strongest corrugated steel plate structures available.

With an impressive 500 mm (19.6") pitch and 237 mm (9.5") depth, its ultralarge corrugations allow it to reach spans greater than 35 m (115') and support stockpile heights of over 30 m (98'). See page 12.



THE EDGE makes underground structures stronger, safer.

THE EDGE Four-Flange Structural Liner is an alternative to the traditional lapped connections that extends structural plate's application range and offers several key advantages. See pages 10 and 12.



GRS Bridges put the dirt to work.

AIL's Geotextile Reinforced Soil (GRS) Bridges were developed for resource industry sectors. They use steel anchor rods to connect a structural steel plate arch to the backfill/geotextile composite and transfers the loads into the surrounding GRS mass. See page 12. From some of the world's largest heavy haul road arches and crusher walls to the smaller drainage and utilidor pipes, many of the world's most progressive mine operators use AlL Mining's efficient infrastructure solutions throughout their operations:

Across the Site | At the Plant | And Underground

Wetland or Wildlife Crossings

We offer a variety of solutions in Ultra•Cor[®], Super•Cor[®], Bolt-A-Plate[®] or Dur•A•Span[®] Structural Plate to suit many sizes and types of applications. Corrosion/abrasion-resistant Dur•A•Span[®] Structural Aluminum Plate is particularly well-suited to saltwater or aggressive environments. Geotextile Reinforced Soil (GRS) Bridges are exceptionally fast and economical resource road solutions. Open-bottom designs and our Prefabricated Bridges are effective, environmentally friendly solutions to preserve habitat.



Protection Structures

AIL's Protection Structures provide a protective barrier from overhead debris while also safeguarding your bottom line. Ultra•Cor® or Super•Cor® are recommended for larger applications and Bolt-A-Plate® for mid-size ones.







Haul Road Crossings

Ultra•Cor[®] the world's strongest structural steel plate, and Super•Cor[®] are natural solutions for larger engineered structures that need to withstand the heaviest of loads. For mid-sized structures, Bolt-A-Plate[®] is usually recommended. All are available in a wide range of shapes and sizes, including bottomless, fish-friendly arches.



Road or Rail Underpasses

We recommend Ultra•Cor,[®] Super•Cor[®] or Bolt-A-Plate[®] according to the size, specifications and load factors for road or rail underpasses. All are virtually maintenance-free.





Conveyor Tunnels and Overcasts

Our products have covered a lot of ground on these critical arterial applications. According to the required size and specifications, overcasts and conveyor tunnels can be made from various shape profiles in Super•Cor[®], Bolt-A-Plate[®] or Corrugated Steel Pipe. In some cases, overcasts can incorporate utilidor-type passages to serve double duty.







Drainage, Ventilation and Utilidor Systems

AIL Mining offers a full range of Galvanized, Aluminized Type 2 or Polymer-Laminated Corrugated Steel Pipe for virtually any mine site infrastructure requirement. In addition, we can supply all of the necessary elbows, couplings and access port accessories.





Permanent or Temporary Bridges

Fast and easy, our Custom Prefabricated Bridges and Modular Bridge Systems come in a variety of widths and spans to handle heavy mining vehicles. Ideal for permanent or temporary applications, these bridges ship and install quickly in remote sites without the need for specialized bridge construction companies. Redeployable Modular Bridge Systems are also available as rentals.



Abutments

Our MSE Retaining Wall Systems and Bolt-A-Bin® System create cost-effective on-site abutments and walls. Bolt-A-Bin® is a cellular bin-type of retaining wall system available in a variety of sizes for vertical or battered applications.





Safety Barriers

According to the needs of the site and safety regulations, we can provide our galvanized Guiderail System or Gabion Basket System.



Stockpile and Load Out Tunnels

Another ideal application for our Structural Steel Plate is the stockpile tunnel. Depending on the planned pile height, Ultra•Cor[®], Super•Cor[®] and Bolt-A-Plate[®] offer excellent strength and cost saving over other methods.













Crusher Walls and Ramps

Perfect for remote mine sites, quarries or gravel pits with available fill material, these structures are easily constructed using our MSE Retaining Wall Systems. Made from heavy-duty galvanized wire, these interlocking wall and soil reinforcement systems provide easy, on-site construction solutions without the need for time-consuming concrete. They are also ideal for bridge or tunnel headwalls and wingwalls.



Sound Barrier Walls

When dealing with ambient mine site, quarry or gravel pit noise, AIL Sound Walls provide optimum performance. Easy to install, our Silent Protector® (Absorptive) and Tuf-Barrier® (Reflective) Sound Wall Systems are engineered for maximum noise mitigation. AIL Sound Walls are ideal for Mine/Quarry Perimeters, Haul Road Fencing, Crusher Fencing and Equipment Screens.



- ▶ 10 times stiffer and 5 times stronger than traditional steel liner plate ▶ Handles extreme loadings
- ► Flanged seams instead of conventional plate overlaps ► Accelerated assembly, easier fitting of plates
- Smaller crews needed, lower installed costs > Added safety, structures can be built from one side
- ► Available uncoated or with hot-dip galvanized or Best-Kote[™] Coating Systems ► Suitable for field-applied coatings
- ▶ Grout coupling sizes and placement to suit site conditions ▶ Custom fittings available
- Structures can accommodate Alimak rails/climbers or mine utility services Facilitates deflection angles
- ► Gaskets allow for leak-resistant structures ► Lower-cost tank storage option ► Structures can be dismantled and removed

Portals and Canopies

Specify Ultra•Cor® or Super•Cor® for larger-scale applications and Bolt-A-Plate® for mid-size ones. Each offers a wide variety of shapes and sizes to suit virtually any site or mine vehicle requirement. Your AIL Mining Technical Sales Representative can help you select the best solution for your needs.





South Africa - Super-Cor[®] Arch

rn Quebec - Super•Cor® Arch







Mine Shafts, Vent Raises, Escape Ways

THE EDGE Four-Flange Structural Liner is ideal for creating underground structures such as mine shafts, ventilation raises and escape ways. THE EDGE is faster and more economical than continuous smooth steel or concrete alternatives. The resulting structures are strong, versatile and safer because they can be assembled from the inside.





THE EDGE Four-Flange Structural Liner provides a safe and cost-effective addition for ground support in hazardous areas. Components transport easily to remote sites, where they can be assembled quickly and safely from the inside. Structures can be completely assembled and moved into an area of unsupported ground, or they can be assembled and advanced one section at a time. For added strength and support, fill material is pumped through grout couplings or ports.



















Ultra-Cor[®] Structural Steel Plate

WIDER SPANS • HIGHER COVERS

- ► The world's strongest corrugated steel plate ► Ultra-deep corrugated and recommended for larger applications
- ► Handles extreme loadings ► Spans can exceed 35 m (115') ► Stockpile heights can reach greater than 30 m (98') ► Corrugation profiles of 500 mm (19.6") pitch x 237 mm (9.5") depth
- Available in: Ultra Low, Low or Standard Arches; and Box Structures
- Available with a variety of footing and headwall/wingwall options
- ► Available with tested and approved Best•KoteTM Coating Systems
- Designed and manufactured to National Standards at our third-party guality-certified facility ISO 9001-2015

Super-Cor[®] Structural Steel Plate

- ► Deep corrugated and recommended for medium-sized applications ► Handles extreme loadings
- ▶ Spans of up to 25 m (82') ▶ Corrugation profile of 381 mm (15") pitch × 140 mm (5.5") depth
- Available in: Low, Medium, Standard or High Profiles Arches; Box Structures; Rounds; and Vertical Ellipses
- > Available with a variety of footing and headwall/wingwall options
- ► Available with tested and approved Best•KoteTM Coating Systems
- Designed and manufactured to National Standards at our third-party quality-certified facility ISO 9001-2015

THE EDGE Four-Flange Structural Liner

- ▶ 10 times stiffer and 5 times stronger than traditional steel liner plate ▶ Handles extreme loadings
- Built on Super-Cor[®] platform > Accelerated assembly, easier fitting of plates
- Smaller crews needed, lower installed costs > Added safety, structures can be built from one side
- ► Available uncoated or with hot-dip galvanized or Best-Kote[™] Coating Systems ► Suitable for field-applied coatings
- ► Grout coupling sizes and placement to suit site conditions ► Custom fittings available
- ► Gaskets allow for leak-resistant structures ► Lower-cost tank storage option ► Structures can be dismantled and removed

Bolt-A-Plate[®] Structural Steel Plate

- Standard corrugated and recommended for smaller applications Spans of 1.5 m (5') to 10 m (33')
- Corrugation profile of 152.4 mm (6") pitch x 51 mm (2") depth
- > Available in: Low, Standard or High Profile Arches; Rounds; Horizontal or Vertical Ellipses; Pipe Arches; and Pear Shapes
- > Available with a variety of footing and headwall/wingwall options
- ► Available with tested and approved Best-Kote[™] Coating Systems
- Designed and manufactured to National Standards at our third-party quality-certified facility ISO 9001-2015

Dur•A•Span[™] Structural Aluminum Plate

- Corrosion/abrasion-resistant for aggressive soil and saltwater applications
- ► Lightweight and strong ► Performance proven in over 15.000 installations worldwide
- ► Spans of up to 12.2 m (40') ► Corrugation profile of 230 mm (9") pitch x 64 mm (2.5") depth
- > Available in: Standard or High Profile Arches; Box Structures; Rounds; Horizontal Ellipses; and Pipe Arches
- > Available with a variety of footing and headwall/wingwall options
- Designed and manufactured to National Standards at our third-party guality-certified facility ISO 9001-2015
- ► Resource Road Crossings Stream Crossings
- **Fish Passages**

Culverts

► Environmentally Sensitive Areas

Structural Plate Arches and Bridges

Structural Plate Arches and Bridges

► Stream Crossings ► Box Culverts

► Grade Separations ► Road or Rail Underpasses

Stream Crossings

Stockpile Tunnels

Portals and Canopies

► Grade Separations

Stockpile Tunnels

Storage Structures

► Escape-Ways

Portals and Canopies

Portals and Canopies

► Stockpile Tunnels

► Grade Separations

Road or Rail Underpasses Stream Crossings and Fish Passages

Heavy Haul Road Arches

Stockpile and Escape Tunnels

► Portals and Canopies ► Culverts

► Conveyor Tunnels and Overcasts

► Storage Structures ► Utilidor Systems

Saltwater and Aggressive Applications

Stream Crossings and Fish Passages

► Road Salt and Other Storage Structures

Protection Structures

► Mine Shafts ► Vent Raises

► Ground Support Structures

Road or Rail Underpasses ► Heavy Haul Road Arches

Relining of Existing Structures

Structural Plate Arches and Bridges

Road or Rail Underpasses

Heavy Haul Road Arches

Heavy Haul Road Arches

► Box Culverts

Geotextile Reinforced Soil (GRS) Bridges

- ▶ Pre-engineered soil bridges fast, economical and fish/wildlife-friendly
- ► Transfers loads from soil arch to surrounding GRS mass ► Maintains existing stream bed
- ▶ No need for concrete footings or pile foundations ▶ Lightweight, ships economically to site
- ▶ Rapid installation ▶ Allows for wide range of backfills ▶ Ideal for remote locations ▶ Low maintenance costs
- ▶ Scour- and piping-resistant ▶ Improved user safety ▶ Supports off-road haul trucks and mining shovels
- ▶ Spans up to 16 m (52.5') ▶ Bridge Abutments ▶ Available with tested and approved Best•Kote[™] Coating Systems

Easy to ship and install.

Long-lasting and virtually maintenance-free, AIL Mining's corrugated metal structures ship and install quickly and economically, with minimal equipment and labour requirements. Our technical teams will guide you through the complete project to ensure its success.



Precast or cast-in-place concrete footings are set over the prepared site.



The first arch segment is completely assembled on the ground.



It is then lifted into place and bolted to the footings on either side. In most cases, a boom truck is sufficient for this.



The segments bolt into base channels integrated into the concrete.



Plates then attach individually to make up other arch segments.



If specified, reinforcement ribs are then added.



Layers of engineered backfill are added in sequential lifts.



The road surface is then completed with safety barriers.



Custom Prefabricated Bridges

- Permanent or temporary applications > Strong: able to withstand heavy-duty loading
- ▶ Spans up to 73 m (240'), most economical between 40 m (130') and 73 m (240') ▶ Widths up to 11 m (36')
- ▶ 10.8 cm (4.25") corrugated steel deck is standard ▶ Decking options poured or precast concrete, asphalt, grating, wood or gravel
- ▶ Weathering, Galvanized or Painted Steel ▶ Bearing plates and pads ▶ Curb or rail system
- ► Excellent fish passage solutions ► Sidewalks and utility corridors can be added to enhance use

- Stream Crossings
- Road or Rail Overpasses
- Detour Bridges



Modular Bridge Systems

- Robust and reusable "quick-build" bridges for sale or rent
- Inventoried components ready to ship and install quickly by local crews
- ► Can be launched from one side without lifting equipment ► Permanent or temporary applications
- Easy to dismantle, store and reconfigure for multiple uses Strong: able to withstand heavy-duty loading
- ► Variety of widths, spans of over 100 m (328') ► Galvanized finish ► Variety of decking options
- ▶ Bearing plates and pads ▶ Excellent fish passage solutions ▶ Sidewalks and utility corridors can be added

MSE Retaining Wall Systems

- Economical system for retaining walls, steepened slopes and erosion control
- ► Heavy-duty, black or galvanized, steel wire interlocking wall and mat construction
- ► Can handle extreme surcharge loads ► Available finishes: natural stone, temporary (fabric), shotcrete or vegetated
- Permanent or temporary applications > Wall heights can exceed 30 m (100')
- ► Height increments are 610 mm (2') ► Adapts to curves, angles and steps
- Time-saving Track-Strip[®] Soil Reinforcement System made from durable galvanized steel

Bolt-A-Bin® Cellular Bin-Style Retaining Walls

- Cost-effective, strong and versatile for mine site or quarry cribwalls or bridge abutments
- ▶ Lightweight, easy to install and ideal for remote areas ▶ Galvanized and Aluminized Type 2 steel construction
- ▶ Size range of 1.2 m (4') to 8.5 m (28') in height, in 3 m (10') increments in length
- ► Full design and engineering support

AIL Sound Walls

- ► Lightweight and durable PVC construction ► Interlocking tongue and groove connection ► Quick and easy to install
- ► Lower installed costs ► Sustainable and low maintenance ► Will not rust, rot or stain
- ▶ Impervious to rain, snow and ice ▶ Unaffected by de-icing salts ▶ Wind load tested for hurricane-force winds
- Meets accelerated test requirements for durability Designed to meet applicable design codes (AASHTO, IBC, CSA)
- Meets ASTM F3459-21 Standard Specification for PVC Exterior Profiles used for Sound Walls
- ► Adaptable to different footing systems ► Available as Silent Protector (Absorptive) or Tuf-Barrier (Reflective)



Corrugated Steel Pipe

- Economical, strong, lightweight and easy to install > Variety of sizes, thicknesses and materials
- ► Complete line of standard and specialized fittings and accessories ► Available in Round or Pipe Arch Profiles
- Can be used to reline existing systems

- Stream Crossings
- ► Road or Rail Overpasses Detour Bridges
- ► Utility Corridors

- Crusher Ramps and Walls
- ► Retaining Walls
- ► Headwalls and Wingwalls
 - ► Bridge Abutments
 - ► Grade Separations

Reclaiming or Stabilizing Slopes

- Protecting Shores
- Preventing Erosion
- ► Road Widening
- Headwalls and Wingwalls
- Loading Platforms or Ramps
- ► Wharves ► Barricades
- ► Barricades ► Blast Walls
- ► Cut-Off Walls
- ► Mine/Quarry Perimeters
- ► Haul Road Fencing
- Crusher Fencing
- Equipment Screens

- ► Culverts
- Drainage Systems
- Stormwater Systems
- ► Fish Passages
- ► Conveyor Tunnels and Overcasts
- ► Ventilation Systems Utilidor Systems

Gabions

For safety barriers, steepened slopes and erosion control, these strong, lightweight galvanized steel mesh baskets hold face alignment with machine filling.

Geotextiles

Woven and non-woven Geotextiles for soil stabilization and reinforcement, erosion control, drainage, filtration, separation and other needs.

Guiderail System

Ideal for road dividers and barriers, bridge approaches and railings, curves and other hazards.

Steel Sheet Piling

Roll-formed with a continuous, positive interlock, AlL's Steel Sheet Piling is stronger and easier to drive. Accessories available.

MSE Wire Walls

Ideal for mine sites and quarries, Wire Walls provide fast, flexible embankment protection for both temporary and permanent applications. Wire Walls easily accommodate curves, angles or steps, culverts, bridge piles or other site requirements.



Starter wire face is installed on a compacted base.



Track-Strip[®] Soil Reinforcement System added.



Backfill added over first course of reinforcement.



First fill lift with fabric and select stone above grade.



Track-Strips[®] slip over verticals in wire face.



Repeat previous steps for additional lifts.



Track-Strip[®] System can skew around obstructions.



Then safety barrier and road surface added.

The Track-Strip® Soil Reinforcement System

- Simplifies wall installations
- Saves time and money on labour and materials
- Easily accommodates obstructions and geometric constraints







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Installation

Streamline your next project with an AIL Mining turn-key solution.

AIL Mining's integrated approach delivers design, manufacturing and construction services under one contract with a single point of responsibility.

Minimize your project risk and tighten the delivery schedule.

This system is used to minimize the project risks for the owner and tighten the delivery schedule by overlapping the design and construction phases of a project.

The AIL Mining turn-key solution benefits:

- ► **Faster Delivery:** AlL Mining's collaborative project management means work is completed faster and with fewer problems.
- **Cost Savings:** Our integrated team is geared toward efficiency and innovation.
- Better Quality: We meet performance needs and not just minimum design requirements often developing innovations that result in a better project.
- ▶ Simplified Communications: One entity is held accountable for cost, schedule and performance.
- Decreased Administrative Burden: Owners can focus on the project rather than managing separate contracts.
- ▶ Reduced Risk: The AIL Mining Team assumes additional risk.

How do you benefit?

- ▶ Higher Profit Margin: Our integrated team is fully and equally committed to controlling costs.
- > Decreased Administrative Burden: Our approach streamlines communication between parties.
- ▶ Increased Market Share: More mine owners are choosing turn-key solutions as the preferred approach.



Your global portal to efficient mine site solutions.

With locations and professional representation around the world, The AIL Mining Team can help increase mine site productivity with efficient infrastructure solutions.



AIL Mining

ailmining.com Global activity based out of AIL Group Corporate Headquarters

The AIL Group of Companies

ailgroupofcompanies.com Corporate Headquarters Sackville, New Brunswick, Canada

Atlantic Industries Limited

ail.ca Based in Cambridge, Ontario, Canada Operations Across Canada

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All International Global activity based out of All Group Corporate Headquarters

AIL Sound Walls ailsoundwalls.com A Division of Atlantic Industries Limited

Call AIL Mining In Canada: 1-877-245-7473 International: +1-778-355-7000

Looking into a mine site infrastructure project? We can help.

From the world's largest haul road arch to towering crusher walls, value engineered infrastructure solutions from AIL Mining have been supporting the world's most successful mine sites since 1965.

By design, our solutions ship and install easily, making them ideal for remote sites. Plus, our in-house engineering teams work with you through the entire project cycle to help you build in success from the ground up.

Contact one of the mine infrastructure experts at AIL Mining. The sooner we get involved, the more you might save.

Contact an AIL Mining Technical Sales Representative.

In Canada: 1-877-245-7473 International: +1-778-355-7000



SAVE TIME AND MONEY WITH AN AIL TURN-KEY SOLUTION.

