



# Mine Site Solutions

Offering innovative products & solutions  
designed to meet the specialized needs of  
today's mines



# ARMTEC CONSTRUCTION PRODUCTS FOR THE MINING INDUSTRY

Armtec has been a leading partner to mining engineers, contractors and project managers for over 100 years. Today Armtec relies on their wealth of experience to help Owners find mining solutions that maximize profitability, ensure efficiency, speed site development, minimize safety risk and promote environmental sustainability. Armtec offers a range of services from on-site engineering consultation to design and drawing preparation to help meet today's challenge of moving larger ore volumes at faster rates and lower costs.



PORTAL ENTRANCE



ESCAPE TUNNEL

Armtec's range of solutions is designed to meet the specialized needs of today's mines in all geographic locations, including unsurpassed strength, high mobility, easy installation, reliability, functionality, versatility and lightweight handling. Our products provide engineered solutions for mine development, materials handling and mining operations, including:

- Mine access roads
  - Grade separations
  - Stream crossings
- Mine portals
- Load-out and reclaim tunnels
- Conveyor covers, conveyor galleries and tunnels
- Underground rockfall protection
- Tunnel liners for soft ground or drift protection
- Geosynthetics for environmental protection, slope reinforcement and soil stabilization
- Raisebore liners for vertical shaft protection
- HDPE pipe for site drainage and heap leach collection





CONVEYOR TUNNEL

## MINING OPERATIONS

### Mine Portals

Mine Portals made from Bridge Plate or Multi Plate provide safe access from surface level to the underground mine entrance. Portals can be designed for depths of over 20m and are made in several shapes and sizes to accommodate single or double lane traffic. If necessary, mine portals can be constructed without significant interruption to mine traffic. Portals are also used for ventilation, weather protection and subsurface road crossings.

### Conveyor Tunnels

Bridge Plate and Multi Plate are used for conveyor, reclaim, safety escape, and stockpile tunnels. They are available in circular or arch shapes to house conveyor belts of all sizes. Tunnels can be sized to include maintenance walkways, lighting, utility lines and ventilation pipes. Hopper and feeder openings can be included if needed.



MINE PORTALS

## RAISEBORE LININGS

Raisebore linings provide a simple, easy to install solution for the protection of personnel and equipment using drilled or bored vertical shafts in underground mines. The linings are fabricated from galvanized corrugated steel sheets curved into circular sections. Once bolted together the sections are lowered in place and anchored to the rock wall. After being anchored, the void between the liner and wall is grouted or filled with aggregate. Raisebore liners are available in sizes from 1200mm to 2000mm and can be fitted with safety ladders and platforms. Raisebore linings have many useful features including long service life, safety and economy.

- Sections can be nested for easy transportation to the site.
- Miners work inside the protected raisebore.
- All sections are plant-fabricated which reduces construction time.
- Sections are easily transported within the mine.
- Easy and fast to install.
- Proven performance.
- Culvert quality galvanizing for long service life.
- Economical material and installation.
- Many uses – manways, ventilation ducts, ore and waste passes, fill raises and service shafts.



RAISEBORE LINING



3/4 HINGED LOCKABLE COVER

## CONVEYOR COVERS

Conveyor covers are available for belt widths from 300mm to 2100mm and manufactured in heavy galvanized steel thickness from 1.3 to 3.5 mm. Covers are normally set at 1200mm centres and are available in full and 3/4 hinged and nonhinged arrangements to allow easy access for belt and idler repair. A 1.8mm thick zinc coating combined with a variety of steel gauges results in life expectancies as much as five times that of other covers. The covers and support bands are made with a 68mm x 13mm corrugation profile which provides added strength to resist heavy wind loads.







BRIDGE PLATE

## ROCK FALL PROTECTION

As roof fall related accidents and development costs in some types of mines continue to rise, it is imperative that safer and more efficient mining methods be established. The issue of protecting work areas requires a protection system that can be easily, safely and economically installed.

Two products suitable for this critical application are Bridge Plate and Tunnel Liner Plate. Both of these products are available in a variety of sizes and shapes to suit a wide range of conditions. Armtec's Tunnel Liner's light weight makes for easy handling and construction of liners for tunnels, shafts or enclosures. Liner Plate can be used to form circular pipes, arches or elliptical shapes and is the ideal product for use in mine applications because it is entirely erected from inside.

For more demanding applications and larger spans, Bridge Plate may be the product of choice. The deeper corrugation and heavier gauge of steel provides more strength over larger spans.



TUNNEL LINER

# PRODUCTS

## Bridge Plate

Bridge Plate offers a deep strong structural plate corrugation. It is ideally suited for the rigors of heavy mine equipment and is used extensively around the world for haul road crossings, deep buried mine portals, long span grade separations and high cover reclaim tunnels. It's stiffness and strength supports today's high capacity mine trucks with a wide range of sizes and shapes. Recognized by ASTM, AASHTO, and CSA, Armtec's unique 400mm x 150mm corrugation is manufactured in 1200mm wide plates, the widest available.

- One of the strongest corrugation in the market.
- Provides ten times the stiffness and three times the strength of conventional SPCSP products. (Structural Plate Corrugated Steel Product)
- Allows height of covers ranging from 0.5m up to 17m.
- Wide range of shapes and sizes, from 4m box culverts to single and double radius 20m arches.

### APPLICATIONS

- Double Lane Portals
- Stockpile and Reclaim Tunnels
- Mine Haul Roads
- Escape Tunnels



MULTI PLATE



BRIDGE PLATE

## Multi Plate

Armtec Multi Plate was first introduced in Canada in 1934 for culvert applications. Since then, the product has gained wide acceptance not only for culverts but for many uses in mining both above ground and in the mine.

- Wide range of sizes and shapes.
- Delivered nested for easy transportation especially to remote areas.
- Can be erected by unskilled workers.
- Fast construction.
- Galvanized for long service life.
- Can be dismantled and re-used.
- High stiffness to resist compaction loads.
- Handles the heaviest mine haulers.

### NOTE:

Multi Plate consists of galvanized corrugated steel plates which are bolted together to form various mine structures such as:

- Mine Portals
- Conveyor Tunnels
- Storage Bins
- Aerial Galleries
- Culverts
- Reclaim Tunnels





BIN WALL

## BIN WALL

Armtec Bin Wall is made up of individual steel members – stringers, spacers, vertical connectors and accessories. The components are erected on site into a series of inter-connected bins. The bins are 3.05m long (parallel to the overall wall length) varying in 6 standard designs from 1.7m depth to more than 5m depth and heights of more than 9m. Bin Wall can be erected at the mine site to form a ramp and level platform for dumping ore and other materials into transport vehicles, rail cars or storage bins. Usually the platform has a reinforced concrete slab onto which trucks back for dumping.

- Individual members are nested for easy shipping and unloading to remote sites.
- Total construction time is very low compared to conventional reinforced concrete design.
- Simple and easy to erect. No special skilled labour required. Parts can be manhandled.
- Can be dismantled and rebuilt elsewhere.
- Fast delivery on all Bin Wall parts.
- No concrete footings required.
- Bin Wall can be used for bridge abutments for access roads.
- Bin Wall is a proven product with 50 years of installations worldwide.

### APPLICATIONS

- Ramps
- Dumping Platforms
- Retaining Walls



BIN WALL



**BOSS 2000**

## BOSS 2000 HIGH DENSITY POLYETHYLENE LEACHATE PIPE

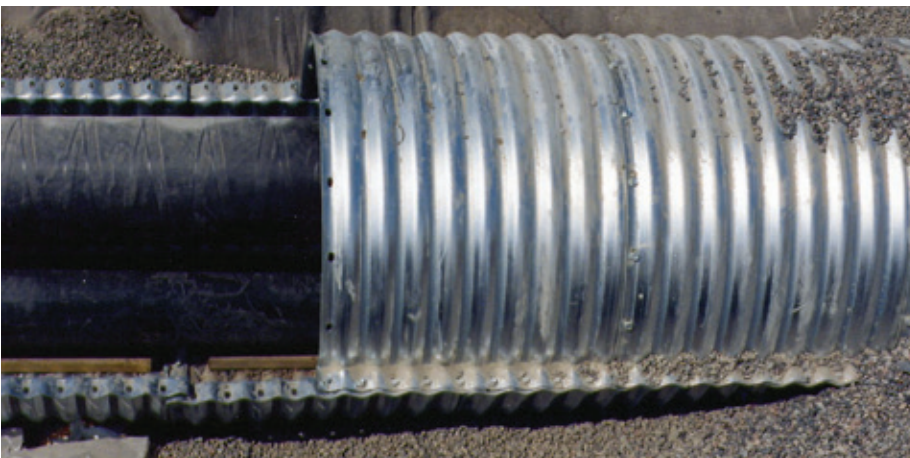
BOSS 2000 corrugated High Density Polyethylene Pipe (HDPE) is used extensively for the collection of liquids in heap leach mining operations. Standard or high strength leachate pipe is available in both watertight bell and gasket, and soil tight split coupling systems. The double wall, smooth interior construction meets the hydraulic and the high strength required of leachate pad installations. Armtec also manufactures BOSS 2000 in solid and perforated pipe, for gravity, sewer and site drainage application, in sizes from 100mm to 900mm in diameter. Armtec BOSS 2000 HDPE pipe is available with a full line of fittings.



**BOSS 2000**

**NOTE:**

Armtec manufactures BOSS 2000 in solid and perforated pipe fully compliant with AASHTO, ASTM and CSA requirements in sizes from 100mm to 900mm diameter.



## NESTABLE CULVERT

When there is difficulty in transporting full length drainage pipe to a remote mine site, it may be beneficial to use Nestable Culvert Pipe. The pipe is available in two types, notched or flanged, in which half sections are bundled together to simplify delivery and for easy assembly at the site. Armtec Nestable Culvert is available in sizes from 300mm to 1800mm in a variety of steel gauges.

**APPLICATIONS**

- Drainage**
- Utility Casings**
- Process Pipe Protection**
- Column Protection**  
(in warehouses ect)
- Ditch Lining**



## SITE DEVELOPMENT

Before any mine can start producing revenue, the site must first be developed. Armtec has a number of products for a variety of mine site applications.

### Drainage

Since 1908, Armtec has been manufacturing corrugated steel pipe. Today, Armtec is able to offer a wide range of pipe products in a variety of materials. Depending upon site conditions, the material of choice can be Galvanized Steel, Aluminized Type II Steel, Polymer Coated Galvanized Steel or High Density Polyethylene Pipe.

### Soil Stabilization

In situations where access roads, airfields, or mine operations are constructed on weak sub-grade soils, cost effective geosynthetic solutions include high strength woven geotextiles or geogrids. These products can reinforce and confine the engineered fill materials, while limiting the amount of sub-excavation and volume of engineered fill required.

### Vegetated Erosion Control

From slope protection to channel linings, rolled erosion controlled products such as Turf Reinforcement Mats and Erosion Control Blankets are highly effective in protecting seed, fertilizer and soil from erosive wind and water forces until well after a permanent root matrix is established.

### Earth Retention

Armtec offers a wide range of retaining wall solutions utilizing both steel and geosynthetic products. Steel retaining wall options include: Sheet Piling and the Bin Wall gravity retaining wall system. Geosynthetic retaining wall solutions generally utilize uni-axial geogrids as the soil reinforcement combined with a variety of facing options. These fascias include: welded wire mesh, cellular confinement, and geosynthetic wrapped face over-steepened slopes.

### Remediation and Decommissioning

Geotubes offer a fast and cost effective solution when dealing with dewatering of sludge and containment ponds. Fabricated using high strength woven geotextiles, geotubes act as the containment vessel for the dredge spoil until the dewatering process is complete.



**BIN WALL**



**GEOTEXTILES**



**MULTI PLATE**

# INTERNATIONAL & CANADIAN MINING PROJECTS



ANGLO COAL, CENTRAL - QUEENSLAND, AUSTRALIA



CHINALCO, PERU





KUMTOR GOLD MINE - KRYGYZSTAN



MARRADONG MINE - BODDINGTON,  
WESTERN AUSTRALIA



NICKEL MINE - MOA, CUBA



TAFF'S QUARRY - CARDIFF, UK



THUNDER BASIN COAL MINE -  
WYOMING, USA



BAY CITY MINE - WISCONSIN, USA



KUMTOR MINE - KYRGYZSTAN



CORTEZ GOLD, ELKO - NEVADA, USA



LIBERIA - AFRICA

Armtec is environmentally conscious  
by supporting limited paper usage.

### **ATLANTIC**

Shediac, NB  
Sackville, NB  
Truro, NS  
Bishop's Falls, NL  
St. John's, NL

### **CENTRAL**

Cambridge, ON  
Comber, ON  
Forest, ON  
Guelph, ON  
Orangeville, ON  
Peterborough, ON  
Sudbury, ON  
Thunder Bay, ON  
Walkerton, ON  
Woodstock, ON  
St-Augustin, QC  
St-Clet, QC

### **PRAIRIES**

Calgary, AB  
Edmonton, AB  
Grande Prairie, AB  
Ponoka, AB  
Redwater, AB  
Winnipeg, MB  
Regina, SK  
Saskatoon, SK

### **WEST**

Dawson Creek, BC  
Genelle, BC  
Langley, BC  
Nanaimo, BC  
Prince George, BC



Armtec is a leading Canadian infrastructure and construction materials company combining creative engineered solutions, relevant advice, dedicated people, proven products and a national presence with a local focus on exceptional customer service.

Call **1-800-565-1152** or visit [armtec.com](http://armtec.com)

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