Water Control & Drainage Solutions

Putting you first with solutions that last.

TITAN

BUILD YOUR LEGEND

HIGH QUALITY ENGINEERED PRODUCTS

Water Control involves controlling the direction or rate of flow of water. Water Drainage is the process of removing excess water by flowing away into pipes or the ground. Both water control and drainage must be planned for in the design and execution of civil construction projects. Not doing so can either make a project impossible to complete or result in its failure.

Titan partners with the best manufacturers in the industry to carry a selection of engineered water control and drainage products used in various construction projects.

Corrugated Steel/Metal Pipe

Corrugated Steel Pipe (CSP – CDN), or Corrugated Metal Pipe (CMP - USA), is mainly used in a cut area underneath a road to allow for water drainage. It is the material of choice for today's infrastructure projects for its optimum combination of strength, flexibility, and performance. CSP/CMP will not crack under impact loads or vibrations due to the inherent strength of the material and the flexibility of the corrugated pipe section. The high ring compression of the pipe absorbs and transfers the load to the surrounding soil around the entire circumference. The beam strength maintains the grade and line of the structure by bridging inequalities of the trench bottom and side fill.

Advantages of CSP/CMP:

- Economical, strong, lightweight, and easy to install.
- Variety of sizes, corrugation profiles, thicknesses, and coatings.
- Complete line of standard and specialized fittings and accessories.
- Available in Round Pipe or Pipe Arch Profiles.
- Can be used to reline existing systems.
- Approved CSA Standard G401-07.

Applications:

- Pipes and Culverts
- Drainage Systems
- Stormwater Systems
- Fish Passages
- Conveyor Covers and Overcasts
- Utilidor Systems

CSP/CMP Coatings

- Galvanized (25 years)
- Aluminized Type 2 (50 years)
- Polymer-Laminated (75+ years)

Soil conditions and other site/application factors can influence your choice of CSP/CPM coatings. An environmental assessment will help you select the appropriate coating to meet your Design Service Life requirements.

Bolt-A-Plate®

Bolt-A-Plate® corrugated steel pipe (CSP) structure is a strong, effective bridging product used as an economical alternative to elaborate bridge replacements. Lightweight, strong and versatile Bolt-A-Plate® comes in a wide variety of shapes, corrugation profiles and arch types to meet varying structural designs. The combination of structural steel and surrounding soil allows Bolt-A-Plate® to support extremely heavy loads.

Bolt-A-Plate® structures may be delivered fully assembled, or may arrive at the site ready for assembly. Every Bolt-A-Plate® structure comes complete with a detailed plan and installation instructions.

Advantages of Bolt-A-Plate®:

- Spans of 1.5 m (5′) to 12 m (40′).
- Corrugation profile of 152.4 mm (6″) pitch x 51 mm (2″) depth.
- Available in: Standard, Low or High Profile Arches; Rounds; Horizontal or Vertical Ellipses; Pipe.
- Arches, and Pear Shaped.
- Bottomless designs are environmentally friendly.
- Can reline older structures.

Applications:

- Structural Plate Arches and Bridges
- Grade Separations
- Road or Rail Underpasses
- Stream Crossings
- Fish Passages
- Culverts
- Heavy Haul Road Arches
- Stockpile and Escape Tunnels
- Portals and Canopies
- Storage Structures
- Utilidor Systems
- Conveyor Covers and Overcasts

Cofferdams

Double Dam & Triple Dam water barriers are inflated tube-like, deployable products made of industrial-grade PVC. They are inflated using the water that you are working against and act like a dike or cofferdam for flood protection and/or diversion needs.

Advantages:

- Reusable.
- Quickly deployed.
- Less costly & time-consuming than conventional sandbags.
- Flexible layout options.
- Can be filled with any available source of water.
- Environmentally friendly.
- Does not damage substrate.
- Suitable for work site dewatering and flood protection in waters up to 6' deep (1.8m).

DOUBLE DAM

The Double Dam features a single internal stabilizing panel to provide safety and stability for all sizes up to 4' (1.2m) high.

TRIPLE DAM

The Triple Dam features two internal stabilizing panels to provide safety and stability for all sizes from 5' (1.5m) up to 8' (2.4m) high.

Flap Gate & Canal Gate

Water control gates are used to manage water flow and drainage in specific locations. Titan offers two types of gates: the Flap Gate and the Canal Gate. Both gates are designed to be mounted to headwalls, corrugated steel, or concrete pipes.

Although they operate slightly differently and serve unique purposes, both gates are built to last and provide years of reliable performance.

Flap Gate

Flap gates are used when flow is only in one direction. They open with water pressure from the back and close with water pressure on the face, allowing for free-flow drainage and preventing backflow. Flap gates are suitable for reservoirs, basins, waste lines, pump stands, or storm drain systems.

Features:

- **Automatic Operation:** The flap operates using flow pressure.
- Available in **Galvanized Steel** or **Cast Iron** frame and cover.
- Offered in various sizes with a **Flatback** or **Spigotback** frame for different installations.
- **Safety Bar Included:** Prevents sticking.
- Available with **Galvanized Steel Angle, Stainless Steel**, or **Brass** links and bolts.
- **Steel Assembly Hardware** included.
- **Optional Features:** The cast iron gate can have a bronze seating face, taper setting collars, and pipe adapters.

Benefits:

- **Free Outflow and Backflow Sealing**: Ensures free outflow and effective sealing against backflow.
- **Maintenance-Free Operation:** Requires no maintenance.
- **Versatile Mounting:** Can be installed on headwalls, corrugated steel pipes, or concrete pipes.

Cast Iron Flap Gate

Galvanized Steel Flap Gate

Canal Gate

Engineered for reliability and performance, Canal Gates are designed for use in canal and pipeline systems operating under low to medium head conditions. Ideal when moderate pressure cut-off is needed, these gates effectively manage flow where moderate seating or low unseating pressure is present. Flow rates are easily controlled through manual gate adjustment, allowing for precise operation tailored to system requirements.

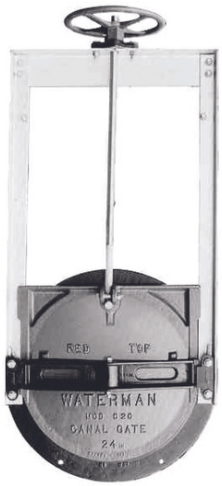
Commonly installed in water treatment facilities, flood control systems, irrigation canals, and diversion structures, Canal Gates offer a durable and dependable solution for a variety of water management applications.

Features:

- Operates with manual “easy-grip” handwheel that adjusts allowable flow.
- Cast iron frame and cover.
- Adjustable side wedges.
- Comes in a variety of sizes with flatback or spigot back frame for various installations.
- Optional rising and non-rising stem extensions and bronze seats.
- **Available in C-20.** For moderate pressure cut-off needs where there is moderate seating or low unseating pressures. Ideal for treatment plants, flood control projects, irrigation canals, and diversion stands.
- **Available in C-10.** For canal and pipeline systems that operate at low heads where a moderately priced gate is preferred. Ideal for farm turnouts, control of industrial wastes, drainage, and tide control.

Benefits:

- **Versatile Mounting:** Can be installed on headwalls, corrugated steel pipes, or concrete pipes.
- **Customizable Design:** Select design variations can be made to match existing equipment requirements.



C-20 Canal Gate

C-10 Canal Gate

CCX® - Irrigation on a Roll

CCX®, like it's sister product Concrete Canvas®, is a flexible, concrete-filled geosynthetic that hardens on hydration to form a thin, durable, waterproof, and low-carbon concrete layer. It is designed as a water conveyance solution for bulk water infrastructure, primarily irrigation canal lining. Essentially, it's concrete on a roll and allows concrete construction without the need for plant or mixing equipment: just add water. CCX® is made up of two interwoven geotextile layers that encase a specially formulated dry concrete mix. A geomembrane backing provides the material's great impermeability.

Two variants of CCX® are currently available: CCX-MAT® (CCX-M®) for erosion control applications & CCX-BARRIER® (CCX-B®) for containment critical applications.

Advantages:

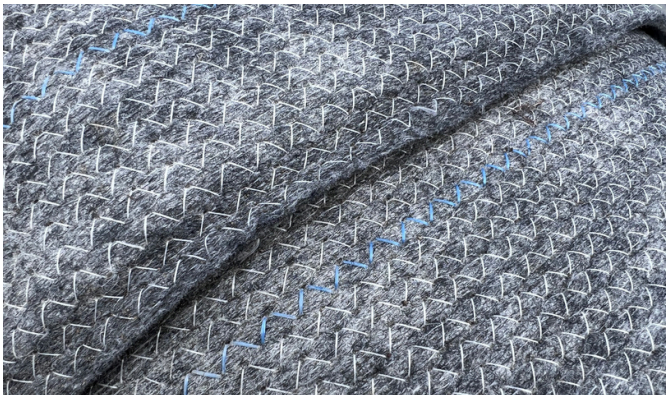
- **Rapid Install** - Because of the rapid installation and significant early strength gain, infrastructure downtime is kept to a minimum. Where maintenance shut-down periods are fixed in critical infrastructure, this allows for much larger areas to be lined or repaired.
- **Reduced Seepage** - Over time, traditional concrete liners can experience widespread cracking owing to differential ground movement, resulting in large seepage losses, undermining, and, in the worst-case scenario, full channel collapse. Because of the fiber reinforcement embedded in its structure, CCX® can withstand a high level of differential ground movement. This reduces crack propagation while maintaining high levels of impermeability.
- **Composition Solution** - CCX® combines the impermeability of a geomembrane with the protection and durability of concrete. CCX® can be installed as rapidly as conventional geosynthetics and 24 hours from hydration will cure to create a hard-wearing concrete liner that is ready to use.
- **Low Logistical Footprint** - CCX® has an un-hydrated unit weight of 14.5-15.5kg/m2 compared to 220kg/m2 for 10cm of cured concrete. This means it is often more than 10 times more efficient in terms of logistical footprint, needing fewer vehicles, and lowering operating overheads.

Water Control Solutions

CCX® Irrigation on a Roll

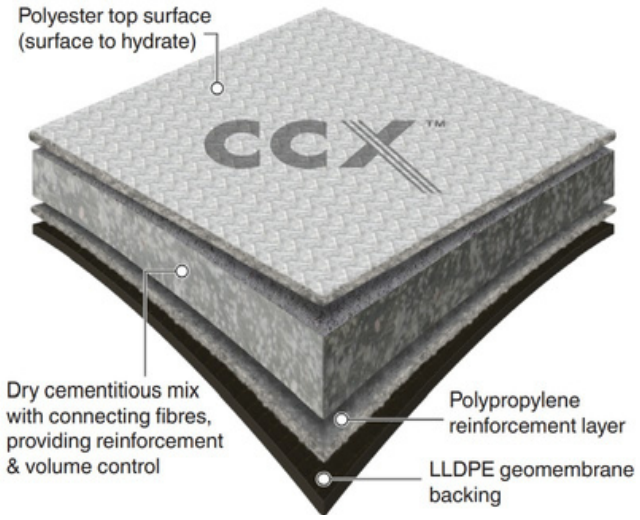
Features

- **High Impermeability** – The LLDPE geomembrane backing of CCX® ensures the material's exceptional impermeability, considerably lowering or eliminating seepage losses.
- **Durable** – CCX® is extremely durable, with an abrasion resistance that is more than 3.5 times that of regular OPC (ordinary portland cement) concrete.
- **Long-term Performance** – CCX® has a life expectancy of over 50 years.
- **Eco-friendly** – CCX® is a carbon-efficient concrete solution that reduces embodied carbon significantly when compared to traditional concrete linings.



Applications:

- Canal Lining
- Waterways
- Hydroelectric Channels
- Slopes



Multi-Flow™

Multi-Flow™ is a comprehensive soil water drainage system that works as a fast-acting, durable solution for the efficient removal of excess soil water.

Multi-Flow's™ design consists of a closed-core geocomposite drain pipe wrapped in thick geotextile fabric which separates the core from backfill. This prevents sand and soil from entering the flow channels.

Advantages:

- **Easy to Use** – Multi-flow™ is panel-shaped and it can be inserted vertically in a narrow trench or laid out horizontally without trenching, which saves a lot of time with installation.
- **Long-lasting** – Multi-flow™ is designed to withstand loads above 6,000 psf; it will not collapse due to heavy surface loads or heavy equipment. Compatible with BMP installation techniques – it contains a highly effective geotextile as a secondary filter which helps keep the flow clean and open.
- **Highly Efficient** – The larger surface area of the Multi-Flow™ pipe compared to the conventional round pipe makes it easier to drain water.
- **Cost-effective** – Proven to have a longer life than its comparable French drain system while being half the cost, Multi-flow™ is an attractive solution for customers and their needs.

Drainage Solutions
Multi-flow™

Applications:

Civil
- Landfill sites.
- Mine
- Leach pile settings.
- Desaturation projects
- Rail Lines
- Railroad yards
- Storage lagoons
- Earthen Dams
- Decontamination processes

Other
- Athletic Field
- Golf Course
- Recreational Area
- Paved Surfaces

Size Options

- 6-inch drain pipe
- 12-inch drain pipe
- 18-inch drain pipe

Fittings, Connectors & Accessories

Push-on fittings and multi-purpose connectors are available and can be used in a variety of combinations to allow for extensive flexibility in drainage design.

HDPE Pipe

High-Density Polyethylene

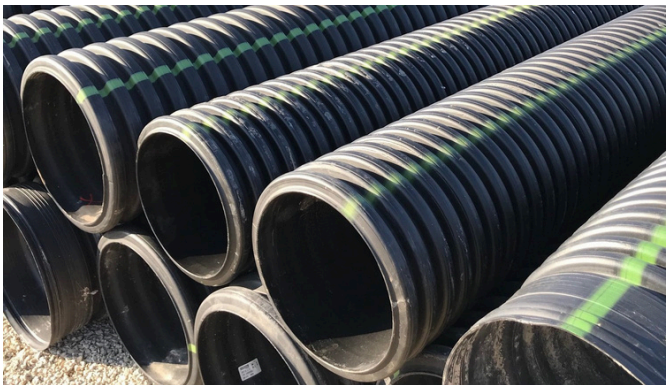
HDPE is a plastic pipe that facilitates water drainage under roadways, or water flow as part of an underground stormwater management arch chamber system. HDPE pipe offers a smooth interior and corrugated exterior for exceptional hydraulics and strength. Titan also offers dual wall, as well as single wall solid and perforated pipe for sub-drain and drain tile applications.

Advantages:

- Superior Hydraulics – A smooth interior will ensure no debris or sediment build-up.
- Easy to handle, safe, lightweight pipe requires less labor and equipment for faster installation and reduced costs.
- Provides superior resistance to chemicals, road salts, motor oil, and gasoline – will not rust, deteriorate, or crumble.
- Withstands repeated freeze/thaw cycles and continuous sub-zero temperatures.
- Split couplers are available.

Features:

- Available in 6.1m (20′) lengths, resulting in fewer joints – pipes can easily be cut to the desired lengths in the field.
- 100mm-1500mm (4″-59″) diameters available.
- Available pipe stiffness of 210 kPa to 320 kPa at 5% deflection.
- CSA B182.8 certified pipe is available upon request.
- Dual Wall HDPE pipe is also available in plain or with bell and spigot ends.
- Custom fittings can be fabricated to suit many applications.
- Fabricated dual wall or Nyoplast catch basins.



Applications:

- Culverts/Cross Drains
- Slope/Edge Drains
- Golf, Turf & Recreation
- Foundation Drains
- Retention/Detention Systems
- Storm Sewers
- Parking Lot Drainage
- Mining/Forestry/Industrial

Titan Environmental supplies proven geosynthetics and specialty civil engineering construction solutions designed to extend the life of vital infrastructure while protecting precious natural resources.

We push limits with creative solutions. Our product lines include geomembranes, geotextiles, geogrids, primary & secondary containment systems, stormwater management solutions, drainage solutions, MSE wall & slope systems, and erosion & sediment control products. We service the road construction, agricultural, waste management, water resources, mining, oil and gas, and hydroelectric industries that support essential infrastructure worldwide. By providing engineers with a resilient foundation for building better, we've become North America's fastest-growing-end-to-end geosynthetics supplier, fabricator, and installer.

We do more than help manage environmental impact, we help improve how that's done. With a team of audacious innovators and agile problem-solvers, we're trusted to adapt to change, respond quickly, and support you at every stage. When you build with Titan, you strive for your very best.

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