

# CEMflex Active Waterstop

## Coated Steel Plate Waterstop



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## Canadian site references

- 18 Hydro Quebec Catch Reservoir, Quebec
- 19 Latimer Heights Phase 1, British Columbia

### Important notes

All current safety regulations and guidelines applicable in those countries where our products are used must be observed.

The photos shown in this brochure feature construction sites in progress. For this reason, safety and anchor details in particular cannot always be considered conclusive or final. These are subject to the risk assessment carried out by the contractor.

In addition, the computer graphics used are to be regarded as system representations. To facilitate understanding, these and the detailed illustrations shown have been partially reduced to certain

aspects. The safety installations that are not shown in these detailed descriptions must nevertheless be available. The systems or items shown might not be available in every country.

Safety instructions and load specifications are to be strictly observed at all times. Separate structural calculations are required for any deviations from the standard design data.

The information contained herein is subject to technical changes in the interests of progress. Errors and typographical mistakes reserved.



# CEMflex Active Waterstop

## Active construction joint sealing

CEMflex active waterstop consists of a steel plate waterstop coated with a patented mineral coating, which actively reacts with alkaline water when embedded in concrete to provide a watertight construction joint.

CEMflex steel plate waterstop functions as both an active and passive barrier to the transmission of water through non-movement construction joints, both horizontal and vertical, in reinforced concrete structures.

CEMflex active waterstop has been proven, through independent testing, to be effective up to 5 bar (50 m) water pressure. CEMflex unique design makes it the safest, most cost-effective, and reliable waterstop available on the world market.



**Simple Design and application**  
two installation methods: install prior to concrete placement or inserted into the fresh concrete



**Active Crystallization**  
the active crystallization process repairs cracks in the construction joint for the lifespan of the concrete



**Highly effective waterproofing**  
verified and certified by independent test laboratories

## How the CEMflex Active Waterstop works

The active crystallization process ensures watertight construction joints

Once embedded in concrete, the CEMflex active mineral coating reacts to the alkalinity of water in the concrete to form Calcium Hydroxide (free lime) which supports the natural self-healing (sintering) of concrete, by crystallizing to penetrate and seal cracks in the construction joint.

The CEMflex active mineral coating has infinite sealing capability. Should alkaline water meet the steel plate, the mineral coating will continue to reactivate and repeat the self-healing, crystallization process.

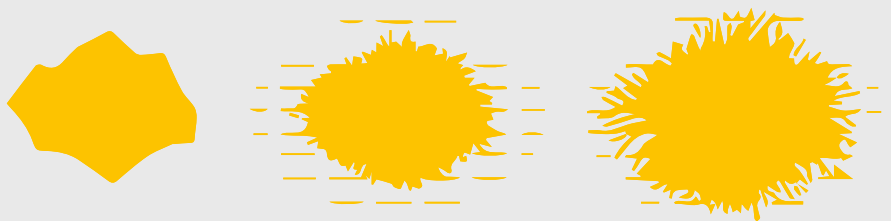
This has been proven through independent laboratory testing which has rated the CEMflex for 100 year service life.



### How the crystallization process works

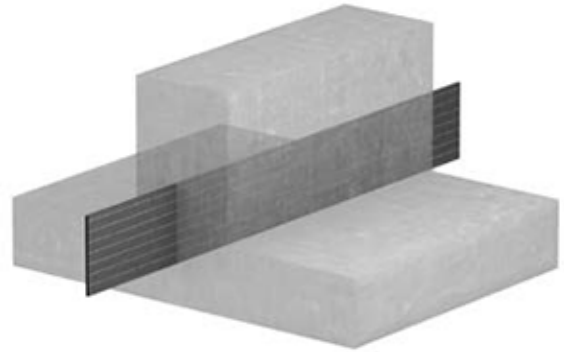
CEMflex steel plate mineral coating reacts to the alkaline in the concrete.

This provokes the natural formation of free limestone, which penetrates and seals cracks in the the concrete.



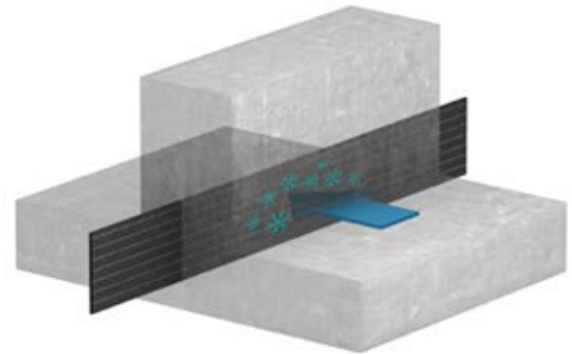
### Physical barrier

CEMflex steel plate waterstop is cast centrally along the construction joint. The steel plate creates a physical barrier which prevents the transmission of water.



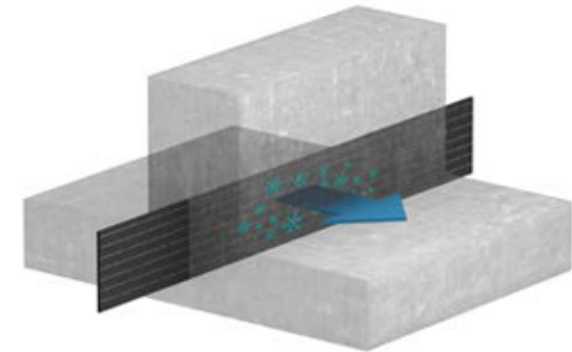
### Crystallization

Fresh concrete activates the mineral coating on the plate causing the coating to soften, crystallize and penetrate any cracks in the concrete. The connection of the mineral coating to the concrete prevents waterflow through the construction joint.



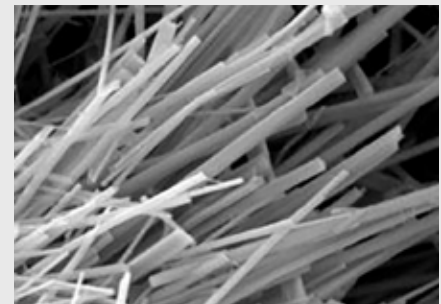
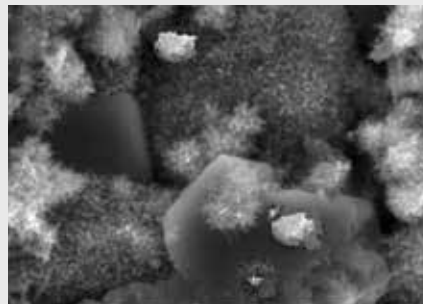
### Unlimited sealing capacity

The sealing process is reactive any time alkaline water meets the mineral coating. The active coating will continue to reactivate during the lifetime of the concrete.



### The crystallization process under the microscope

You can observe the active self-healing process of CEMflex under a microscope. When the crystallization of the coating takes place, calciumhydro-xy-based crystalline fibres and needles are created.



## Simple and economic handling

Two simple installation methods



CEMflex active waterstop can be used for all non-movement construction joints, slabs and walls, vertical and horizontal applications.

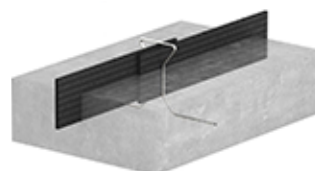
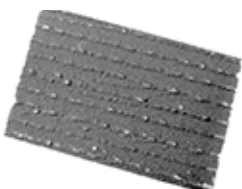
The CEMflex is simple to handle, there is no preparation work and no special installation tools are required.

CEMflex eliminates cutting, welding, or bonding of waterstops.

Additionally, CEMflex is fully weatherproof system and can be installed in wet and dry conditions.

### **CEMflex waterstop consists of only three simple core components:**

1. CEMflex 2.00 m x 1.50 m coated steel plates
2. CEMflex clip
3. Omega holder



## Installation Guidelines

CEMflex steel plates are cast along the center of the construction joint and require a minimum 30 mm embedment into the concrete. To extend the waterstop simply overlap the steel plates by 50 mm and secure with a CEMflex clip or with the omega holder, depending on the installation method.

### Installation prior concrete placement

The CEMflex steel plate is installed in the middle of the construction joint requiring a minimum 30 mm embedment.

CEMflex steel plates are fixed to the reinforcement prior to concrete placement and secured at the 50 mm overlaps with Omega clips.



### Installation during concrete placement

It is also possible to insert the CEMflex steel plate into the freshly poured concrete.

The CEMflex steel plate are inserted in the middle of the construction joint requiring a minimum 30 mm embedment in the fresh concrete.

Use clips to secure 50 mm overlap.



### Simple Installation Video

CEMflex simple handling and installation methods can save up to 80% labour costs.

Observe simple installation video.

## Simple and fast installation

CEMflex simple design reduces labour requirements on site

### Easy and fast forming by hand

CEMflex steel plates are simple to fold by hand and can be formed to suit the structural shape.

This eliminates cutting, welding and bonding of the waterstop.

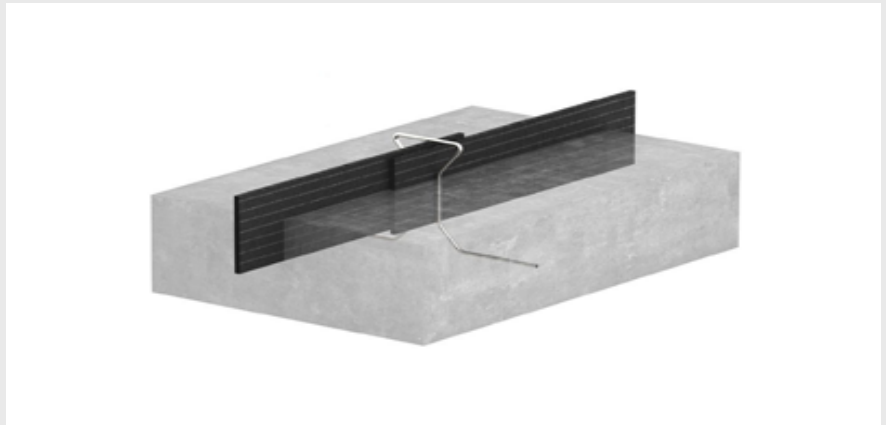


### Connection between CEMflex plates

CEMflex steel plates require a minimum 50 mm overlap.

The plates can be connected with Omega holders or Clips depending on installation method.

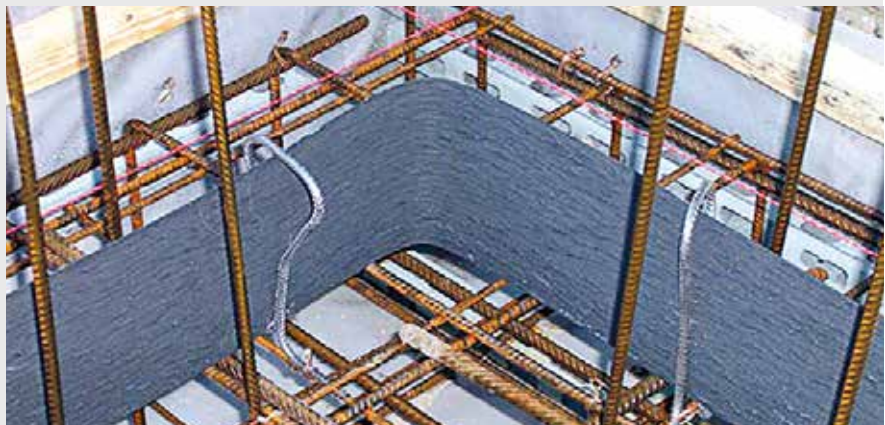
no welding, bonding or glueing of the steel plates is required.



### Formation of corners

Installation around corners

CEMflex steel plates can be folded by hand. No special tool or welding required.



### Formation of T-junctions

CEMflex steel plates can be folded into T-junction corners and intersections.

There is no need to prefabricate corner elements in factory settings.



### Formation of round shapes

CEMflex steel plates can also be formed circular shapes.



### Sealing of horizontal and vertical concrete joints

Horizontal and Vertical applications

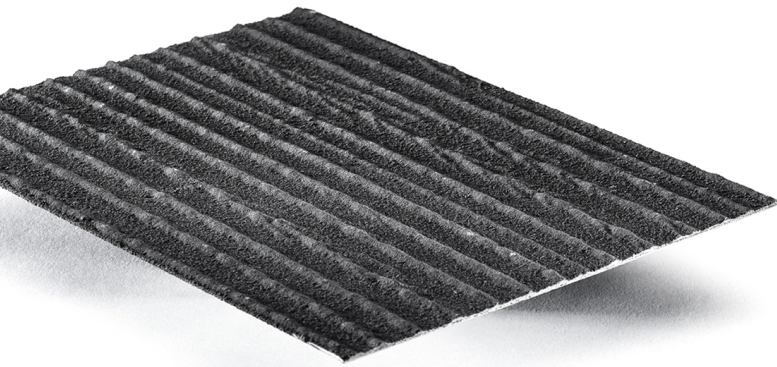
CEMflex steel plates can be used for all non-movement construction joints.

Works for vertical and horizontal, wall and slab applications.



# Waterstop comparison

## CEMflex vs. Traditional Waterstops



### CEMflex benefits and advantages

- 80% labour savings compared to traditional waterstops
- Higher Capacity; up to 5 bar water pressure
- Active mineral coating continues to reactivate during the life span of the concrete structure
- Fully weatherproof, rainwater or moisture does not activate the mineral coating
- Installed by less experienced workers
- No welding, gluing or bonding required
- Reduces risk of human error or faulty installation
- No power tools or welding irons needed
- Doesn't produce hazardous fumes or odors
- No preparation work required, ready to install from the box

### Cost savings

Experience and feedback from site show that the usage of CEMflex minimizes your expenses significantly:

- You can save up to 80 percent installation costs compared to conventional PVC waterstops
- You can save up to 80 percent installation costs compared to hydrophilic waterstops

### CEMflex

- Eliminates welding and cutting
- No fumes or hazardous odors
- Cost effective corner, T-junction and intersection solution
- No tools needed
- Same product for all non-movement construction joints
- Installed by less experienced worker
- Rated up to 5 bar water pressure

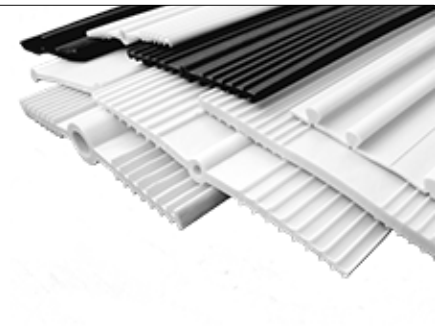
- Eliminates gluing and bonding
- Fully weatherproof system
- Moisture or water doesn't affect the special coating
- Installed by less experienced worker
- Rated up to 5 bar water pressure

- Active mineral coating reacts to alkaline water
- Crystallizes to fill cracks in the construction joint, infinite sealing capabilities
- No preparation work needed
- Fully weatherproof
- Two simple installation methods
- Installed by less experienced worker

## Traditional Waterstops

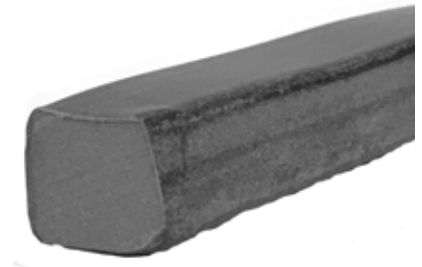
### PVC Waterstops

- Welding and bonding of PVC required
- Welding produces fumes and hazardous odors
- Corners, T-junctions and intersections require welding of PVC
- Requires power tools and welding iron
- Available in different sizes, shapes and specs depending on capacity and application
- Skilled workers required
- Rated up to 2 bar water pressure



### Bentonite

- Gluing and bonding required
- Needs to be installed in dry conditions
- Moisture and water will cause the profile to expand
- Requires skilled specialist to install
- Rated up to 2 bar water pressure



### Krystol Waterstop Grout

- Crystalline grout reacts to water and unhydrated cement particles
- Crystallizes to fill cracks in the construction joint. Does not continue to react
- Concrete surface must be clean, dry and free of dirt
- Apply waterstop grout and waterstop treatment along the construction joint
- Installed by skilled specialists



# Highly effective waterproofing

## Verified and certified by independent test laboratories

**CEMflex active waterstop has been proven through independent testing and is currently in use worldwide. By using, CEMflex, you can be sure the construction joints of your building are water-tight and sealed.**

CEMflex Active Waterstop has been tested successfully under severe condition, in accordance with independent and international test laboratories:

- ICC Evaluation services – Tested in North America up to 5 bar water pressure
- European Technical Assessment - Tested in Europe up to 5 bar water pressure
- Vattenfall test report – Tested in Sweden up to 8 bar water pressure



ICC Evaluation Service (ICC-ES) is the industry leader in performing technical evaluations of building products, materials and systems for code compliance.

**Please feel free to contact us for more information about the test certificates and evaluations valid in Canada.**



The German institute of Structural Engineering has verified and issued CEMflex various European Technical Assessments in accordance with EU regulations.



The functionality of CEMflex has been tested and approved for 8 bar (80 m) water pressure by Vattenfall Research and Development, AB Sweden.



CEMflex has been tested worldwide and has been rated for 100 year service life by the DB Germany Railway.

# Highly effective waterproofing

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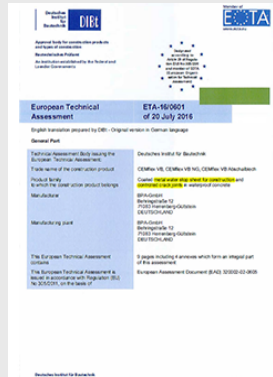
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## CEMflex advantages at glance

Contractors, engineers and the site personnel benefit alike

**the CEMflex active waterstop simple design and installation methods provides a variety of benefits and advantages.**

All project participants – contractors, engineers as well as the site personnel benefit from the unique and sophisticated functionality.



### Contractors

- Avoid costly water leaks due to faulty installation
- 80% labour and time savings compared to traditional waterstop systems
- Fully weather proof system, no installation delays due to weather
- Increased health and safety conditions for workers
- No waste generated
- No waste for workers



### Engineers

- Tested by independent test laboratories
- Active crystallization waterstop
- Rated for 100 year service life
- Up to 5 Bar water pressure
- Tested and approved worldwide



### Site personnel

- Simple installation methods
- No skilled specialists for installation required
- No special installation tools required
- No special preparation required
- No welding and additional protection tapes required
- Easy forming of corners and wall intersections by hand

## Additional advantages

### Eco-friendly packaging and safe storage on site

#### Eco-friendly packaging

CEMflex is delivered in a wooden box.

CEMflex is supplied in 2.00 m x 150 mm steel plates.

Each box carries 50 pcs of the CEMflex steel plates and 50 pcs of the clips.

Additional clips and omega holders are sold separately.



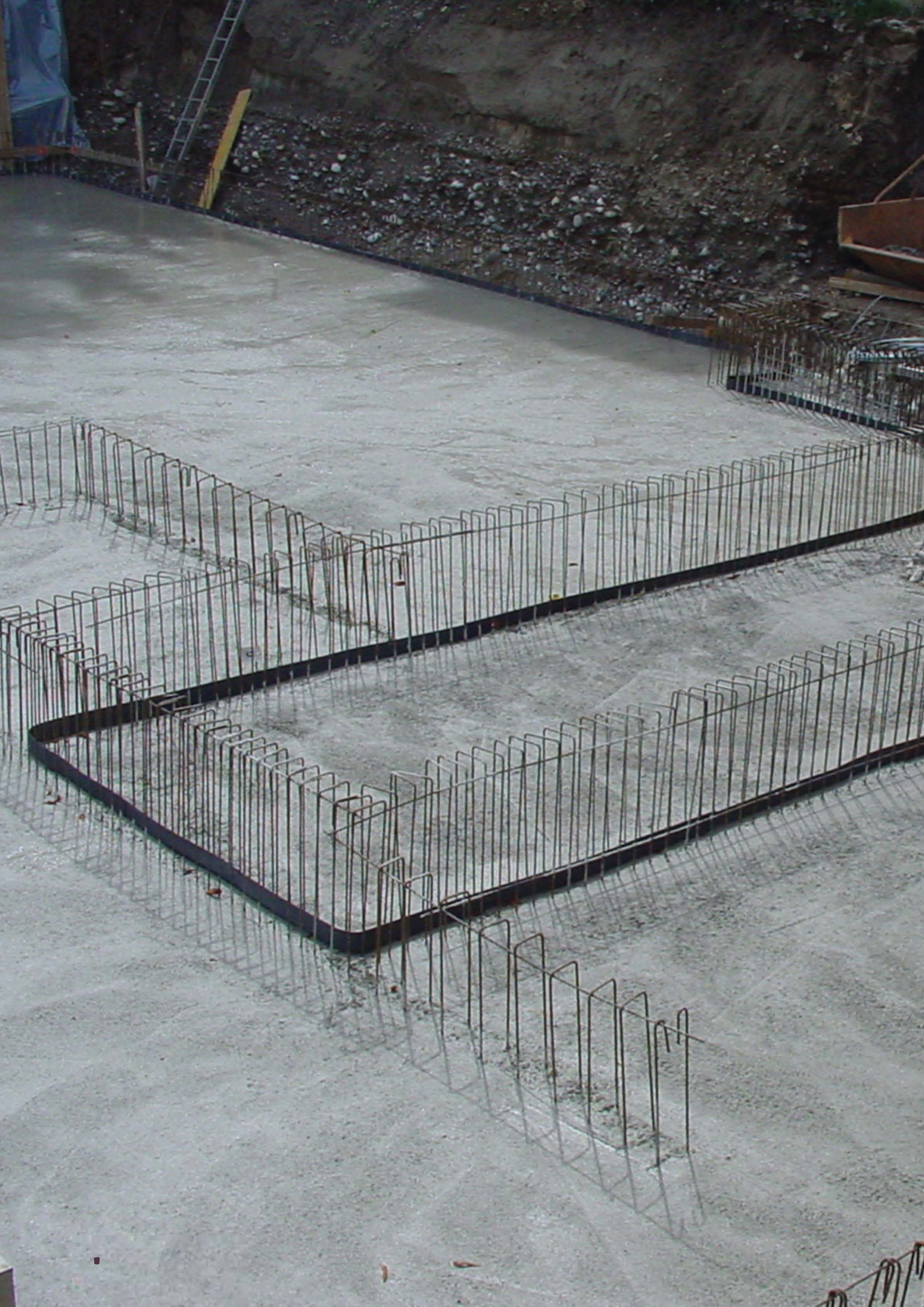
#### Safe storage on site

CEMflex can be stored on site in all weather conditions. Rain water or moisture does not have adverse effects on the active mineral coating.



#### Advantages and benefits

- No plastic liner or foil packaging
- Rain water or moisture does not affect the mineral coating
- Dust, dirt or concrete splatter does not affect the mineral coating
- Steel plate is not affected by UV sunlight
- Steel plate can be left exposed to the elements



## Hydro Quebec Catch Reservoir, Quebec

CEMflex waterstop installation is 80% faster than PVC waterstop installation, which saved 13.5 hours of labour costs and 1 work day on the construction work schedule.

Construction St-Arnaud tested the CEMflex active waterstop at a Hydro Quebec catch reservoir structure to compare the installation methods against PVC waterstop.

The project required approximately 65 m of PVC waterstop along the footing construction joint. Construction St-Arnaud scheduled 1 work day, 8 hours, and 2 workers to install 65 m of waterstop.

St-Arnaud decided to test both CEMflex steel plate installation methods:

- In the first method, 50 m of CEMflex was fixed to the steel reinforcement prior to concrete placement.
- In the second method, 15 m of CEMflex was inserted into the fresh concrete during concrete placement.



### CEMflex vs. conventional PVC Waterstop Installation Comparison

#### CEMflex Active Waterstop install

- 65 m of waterstop installed
- 2 hours and 20 minutes of labour
- 2 hr 20 mins x \$60 per hr = \$140
- \$140 labour costs

#### Conventional PVC Waterstop install

- 65 m of waterstop
- 16 hours of labour
- 16 hrs x \$60 per hr = \$960
- \$960 of labour costs

**Richard St-Arnaud** Project Manager

“Our site team was impressed with the quality of the CEMflex waterstop and the ease of installation. The site feedback was very positive, it’s a great product and we intend to use it again in the future.”

#### Contractor

Construction St-Arnaud, Sainte-Geneviève-de-Batiscan, Quebec

#### Field Service

PERI Canada, Laval

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## Latimer Heights Phase 1, Langley B.C.

The CEMflex active waterstop is up to 90% faster to install than the Krystol waterstop grout, which saved Caliber projects 539 hours of time and labour costs.

Caliber projects tested the CEMflex active waterstop at Latimer heights Phase 1 to compare the installation method against the Krystol waterstop grout.

Phase 1 underground parking structure required approximately 2,200 m of CEMflex active waterstop installed along the exterior structural walls and parkade slabs construction joints.

CEMflex steel plates were fixed to the reinforcement prior to concrete placement using Omega Clips at the overlaps.



### CEMflex vs. Krystol grout Installation Comparison

#### CEMflex Active Waterstop install

- One worker at \$25 hourly rate
- 2,200 m of waterstop
- 45 m installed per 1 hr
- $2,200 \text{ m} / 45 \text{ m} \times 1 \text{ hour} = 49 \text{ hrs}$
- $49 \text{ hours} \times \$25 \text{ per hour} = \$1,225$

#### Krystol waterstop grout install

- Two workers at \$40 hourly rate
- 2,200 m of waterstop
- 45 m installed per 12 hr
- $2,200 \text{ m} / 45 \text{ m} \times 12 \text{ hours} = 588 \text{ hrs}$
- $588 \text{ hours} \times \$40 \text{ per hour} = \$23,520$

#### Shuan Neufeld Site Superintendent

"Caliber likes the fact that we can install the CEMflex waterstop while using shotcrete, in rainy weather, and there is no preparation work required before installation".

#### Contractor

Caliber Projects Ltd.  
Langley, British Columbia

#### Field Service

PERI Canada, British Columbia

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