

# Inco Speeds Up Flooring Renovation with Prefabricated Thermoplastic Trench Liners

**LOCATION**

Copper Cliff,  
Ontario, Canada

**OPERATION**

Copper refinery

**PRODUCTS**

PENNCOAT™ 101 Membrane  
PENNCHEM™ Mortar  
ACROLINE™ Systems

**Challenge:** Need for chemical-resistant floor, trench, and sump lining for cell house basement

**Solution:** ACROLINE Systems HDPE anchored thermoplastic liner to replace acid-resistant brick (ARB) lining, and PENNCHEM Mortar with PENNCOAT 101 to replace adjacent ARB floor

Inco is no stranger to acidic processes. The basement of the copper refinery cell house at the Copper Cliff, Ontario, plant is continually exposed to acid overflow from the electrolytic cells above. This harsh environment requires long-term, high-performance corrosion protection.

Inco has always trusted acid-resistant brick (ARB) systems to meet these high demands. But recently, Inco discovered a faster system for refurbishing ARB trench and sump linings. ErgonArmor's ACROLINE Systems anchored thermoplastic liners were selected to expedite the construction schedule without sacrificing longevity or performance.

The 100,000 square foot brick-lined cell house floor is segmented into roughly 10 different drainage areas, each including a collection trench and sump. ACROLINE Systems anchored thermoplastic liners, 5mm thick in HDPE, were specified for the trench and sump in the drainage area, which was refurbished in 1999. The owner recognized that renewing the trenches and sump with ACROLINE Systems would reduce construction time and, more importantly, plant downtime.

Replacing an ARB lining in a trench or sump is time-consuming and requires several steps. First, the existing ARB is removed, along with any deteriorated or contaminated concrete. Then the concrete substrate is repaired by forming the trench or sump and pouring new concrete. Once the new concrete cures, a membrane is applied. Lastly, the bricks are buttered with mortar and laid. By choosing ACROLINE Systems for sumps and trenches, half



*Joints between prefabricated trench liner sections are welded for leak-tight seal*

of these steps and most of the field labor are eliminated. After the old ARB system and damaged concrete are removed, the prefabricated, pre-formed liners are set and cast in place. Once the concrete cures, field joints are welded and tested to ensure they are leak-tight. The system is then ready for service.

Typically field joints in ACROLINE Systems are few and far between. The number of field joints depends upon access to the construction area and layout of the system. Trench liners can be shop-fabricated and readily shipped in sections nearly 40 feet long.

In order to fully protect the concrete floor against acid attack, it was necessary to integrate the ARB and ACROLINE systems. A horizontal lip 3 inches wide of 5mm HDPE with embedded polyester fabric was welded to the top edge of the trench and sump liners. The fabric provided a bonding surface for the PENNCOAT 101 membrane, which was applied over the floor and fabric-backed plastic. The first row of bricks adjacent to the trench and sump were set, such that it overlapped one inch of the membrane-covered plastic lip.

At Inco, close spacing between columns in the basement restricted the length of sections, which could be moved into the construction area. Two field joints were required for the 50-foot long trench and roughly 4-foot cubed sump. CRP Products & Manufacturing Ltd. fabricated the trench and sump liners in the controlled environment of its Edmonton, Alberta, shop. The liners were supplied with self-contained forms for grouting. The adjacent ARB floor was replaced in kind, using PENNCOAT 101 Membrane and PENNCHEM Mortar.

ACROLINE Systems provide long-term, leak-tight protection for concrete exposed to corrosive chemicals. Liners can be custom designed and fabricated, making ACROLINE Systems a good choice for new or retrofit construction.

Although ACROLINE Systems require no maintenance, the liners can be repaired if exposed to physical abuse. The unique, discreet anchors of ACROLINE Systems allow the liner to bridge cracks in the concrete substrate, while maintaining the integrity of the corrosion barrier.

