

# ARMORMAX®: An Innovative Solution to a 75-Year Erosion Challenge



*Frigid temperatures made the ground difficult to install into but the team found a solution that worked.*



*Gabion baskets were first filled with rock and placed on the base-floor of the channel.*



*Vegetation is starting to grow through.*

By Chantal Lambert, Titan Environmental Containment

**T**he environment continues to be a hot topic and helping to manage and minimize potential environmental risks is at the heart of what Titan Environmental Containment (Titan) does. Founded in 2006 as a prairie-based company, Titan has become an industry leader in the selection, supply and installation of state-of-the-art geosynthetics, containment systems and civil engineering construction products that support important public infrastructure.

With product lines featuring geomembrane for lagoons and landfill lining, geotextiles and geogrids used in road construction and site works, water control and drainage products, and erosion and sediment control products, we strive to provide cost-effective solutions for a variety of applications and unique client needs.

With this in mind, in 2017 we expanded our Erosion Control line to include the ARMORMAX® Engineered Earth Armoring System. Proven to provide up to 75 years of design life, this advanced flexible armoring system consists of PYRAMAT®, woven three-dimensional High-Performance Turf Reinforcement Mat (HPTRM) with X3® fiber technology, and Engineered Earth Anchors (EEAs).

A vegetating system, ARMORMAX® is specifically designed for severe erosion and surficial slope stability challenges, and can be used in erosion control applications where additional factors of safety are required, including protecting earthen levees from storm surge and wave overtopping, and protecting

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stream, river and canal banks from scour and erosion. ARMORMAX® is also ideally suited to protect stormwater channels in arid and semi-arid environments where vegetation densities of less than 30 per cent coverage are anticipated.

Given this, ARMORMAX® was found to be the ideal solution for a nearly two-mile long section of the Reinland Drain, a large municipal drainage channel in South-Eastern Manitoba. This channel holds and drains intermittent water flow from regional spring melt/breakup and peak discharge events. Heavy run-off flows and flooding had been causing consistent rip rap failure resulting in reoccurring erosion of the channel slopes or banks—an on-going problem spanning 75 years.

The municipality needed a longer-term solution to stabilize the eroded channel banks and prevent further loss. ARMORMAX® was selected because of its cost savings, its ability to outperform hard armoring solutions and its environmental sustainability. For example, one truckload of 20,000 square yards of ARMORMAX® is equivalent to 667 truckloads (6,667 cubic yards) of rip rap rock. The result is lower transportation costs, lower emissions and reduced carbon footprint.

Titan supplied and installed the product. Gabion baskets were first filled with rock and placed on the base-floor of the channel then a total of 38,000 m<sup>2</sup> of ARMORMAX® was installed on the channel slopes.

Being a winter installation, the extreme cold conditions made it challenging to penetrate the frozen ground with the system's B1 Anchors and five millimeter, 18-inch spikes. Our installation crew quickly adapted and switched to 10 millimeter, 12-inch pins, which were within the acceptable specification range and allowed for successful installation. The channel was later hydroseeded by another contractor to ensure vegetative growth through the matts—critical to helping lock soil in place and protect against hydraulic stresses.

Within six months the channel was fully vegetated. This was the first ARMORMAX® project in Manitoba and the largest of its kind in Canada. ▀

*Chantal Lambert is the Manager of Marketing & Communications for Titan Environmental Containment. For more information on Titan's Erosion Control Solutions visit [www.titanenviro.com](http://www.titanenviro.com) or call (866) 327-1957 and ask to speak to one of our knowledgeable sales representatives.*



*In half a year, the channel was fully vegetated.*

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