



Completed canal lining works

Project Info



05 / 05 / 22



CCX-MAT™ (CCX-M™)



380m²



Transverse layers



Naoussa Imathias,
Greece



TOEV Naoussa &
Supervised by Innovaland
and Concrete Canvas Ltd



CCX-M™ used to
provide erosion control
to an existing canal and
reduce water seepage.

In May 2022, CCX-MAT™ (CCX-M™) GGCM* was used to provide erosion control and reduce water seepage to an existing canal in Naoussa Imathias, Greece. The canal provided irrigation to adjacent fields, however erosion of the substrate resulted in the canal losing water.

A reinforced poured concrete lining solution was initially considered. However this method would be both time consuming and costly. CCX-M™ was suggested and used, with the material being easier and quicker, requiring less machinery and man power to install but also being more economic, reducing the mass of material used and lowering the carbon impact.

CCX-M™ is a **Type II** GCCM as defined in [ASTM D8364](#) - Standard Specification for GCCMs. CCX-M™ is suitable for lining canals with soil subgrades and was chosen for this project to suit the abrasion, wear and loading requirements. ASTM D8364 is the only internationally recognised GCCM specification standard and defines the minimum performance values based on the use of test methods that are specific to GCCM materials. It is an important resource for clients, consultants and contractors wishing to ensure the GCCM used on their project is fit for purpose.

The works were carried out by TOEV Naoussas with the supervision from the suppliers Innovaland and Concrete Canvas Ltd.

*Geosynthetic Cementitious Composite Mat





Existing canal before work commenced



CCX-M™ rolled out and cut to desired length



CCX-M™ laid transversely



Overlapped edges secured with 30mm long screws



CCX-M™ hydrated after installation



Completed CCX-M™ Installation

Before the CCX-M™ material was installed, tree roots and rocks were removed to prevent damaging the LLDPE backing. Once all debris was removed, the canal was then re-profiled by hand to create as smooth and uniform surface as possible. Anchor trenches were excavated down both sides of the canal. Once dug, the CCX-M™ material was rolled out transversely across the canal with the aid of an excavator and spreader beam and cut to the desired length - with each leading edge overlapped and pegged with 12mm thick J-pegs. The subsequent layers of CCX-M™ were overlapped by 100mm and joined using adhesive sealant, secured with 30mm long screws at 50mm spacings. Once installation was complete, CCX-M™ was hydrated with the use of an agricultural hose. Finally both anchor trenches were back filled with the excavated soil.

380m² of CCX-M was installed in 2 days by a team of 7. The first day was spent cleaning and preparing the canal and second used to cut, lay, fix and hydrate the CCX-M™ material. Taking into consideration the speed in which CCX-M™ was installed the client could understand the savings made compared to the traditional methods of installing reinforced concrete by hand. The client was extremely pleased with the results of the installation and are now considering CCX-M™ for further projects.

“CCX is an impressive marvel of technology and is exactly the solution we were looking for for the past 30 years”

Mr Kostas Papadopoulos
President of TOEV Naoussas

“Now we can fix our problem forever without the need of any maintenance ever again”

Mr Thomas Bliatkas
General Secretary of TOEV Naoussas