Projects

Buckeye LNG terminal, Texas, USA

Doho airport, Indonesia

Changuinola river, Panama

Maheshkhali, Bangladesh

Maersk Vado Ligure, Italy

Karnavati river, India

Want to discover more?

Check our website by scanning this QR code

Geotechnical engineering,
innovative solutions to

Retain / Cross / Protect / Strengthen

GEOQUEST

©2026 Soletanche Freyssinet - The text, photos and other information contained in this catalogue are the property of Soletanche Freyssinet. Any reproduction, display or other use, in full or part, without the prior consent of Soletanche Freyssinet is prohibited. Publication: September 2026.

Geoquest Hong Kong
geoquest_group
Geoquest Group

www.geoquest-group.com.hk

GEOQUEST

Geosynthetics

FFCM

The fabric-formed concrete mattress solution to provide superior and affordable cast-in-place erosion control and scour protection

Fabric-formed concrete mattress (FFCM) is a cutting-edge concrete mattress solution engineered to deliver robust and long-lasting erosion and scour protection. Designed for versatility and speed, it can be installed both on dry land and underwater without the need for dewatering, saving time and reducing costs. Whether protecting riverbanks, bridge abutments, flood channels, or industrial sites, FFCM offers a reliable solution that adapts to various projects.

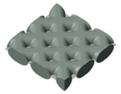
FFCM combines innovation, durability, and sustainability in one comprehensive solution. Whether for hydraulic and maritime projects, landfill containment, or slope stabilization, it gives a solution with minimal environmental impact for erosion control.

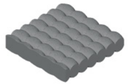
Challenges

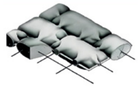
- Exposure to high hydraulic forces causing erosion and structural instability
- Complex installation conditions, including underwater environments
- Need to reduce construction time
- Risk of soil loss, scour, and hydraulic uplift pressures
- Long service life and low maintenance requirements
- Variable terrain and flow conditions requiring adaptable solutions
- Environmental constraints and need for ecological integration

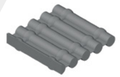
Solution

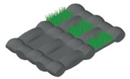
FFCM is based on a double-layer fabric structure that is deployed on site and filled with fine aggregate concrete to form a continuous protective mattress. This approach creates a flexible and highly resistant layer capable of withstanding hydraulic forces while maintaining close contact with the ground. The integrated design helps counteract uplift forces and reduce seepage effects, thereby improving the overall stability of this erosion and scour protection solution. Available in multiple configurations, FFCM can be tailored in thickness, weight, and geometry to match specific project requirements and environmental constraints.


Filter Point


Uniform Section


Articulating Block


Filterband

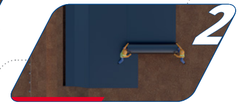

Enviromat

Grout bags

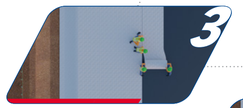
- Pre-engineered, factory-customized mattress structure
- Rapid installation, including underwater operations without dewatering
- High-strength woven geotextile made from polyester yarn
- Multiple fabric-formed types
- Concrete-filled compartments galvanized steel cables for flexibility and articulation

Installation in 4 steps

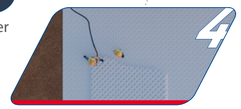
Site preparation (grade, stake and trench)



Non-woven geotextile installation for soil retention



Roll out and join with zipper closures



Fill with fine aggregate concrete and carry-out inspection

Benefits

- Reliable long-term protection against erosion and scour
- Rapid installation in both dry and underwater conditions
- Elimination of the need for temporary cast-in-place concrete formwork and associated costs
- High mechanical resistance with flexibility which conforms to variable ground conditions
- Adaptability to complex hydraulic conditions
- Support for vegetation and environmental integration
- Reduced maintenance requirements over the project lifecycle

Geoquest services include:

- Conduct cost analyses
- On-site services with technical advice and guidance or site installation (depending on project and location)

Support from A to Z

Geoquest supports each project from initial analysis to installation, ensuring a fully tailored and efficient delivery:

1. Project assessment to define the most suitable solution
2. Integrated design aligned with technical and operational requirements
3. Manufacturing of customized configurations
4. On-site guidance and installation support

FFCM is suitable for a wide range of applications

FFCM combines advanced engineering with execution efficiency to deliver a reliable and high-performance solution for erosion control and scour protection across a wide range of environments. Its engineered fabric structure, coupled with controlled concrete thicknesses, ensures consistent behavior under hydraulic stress while maintaining flexibility and close ground conformity.

FFCM simplifies construction by enabling faster project delivery. This approach helps limit construction risks while improving overall cost efficiency. Its capacity to adapt to varying terrains, flow conditions, and project constraints makes it a reliable choice for infrastructure projects.

Beyond its structural performance, FFCM supports sustainable design objectives by limiting site disturbance and enabling vegetation integration where required.

The solution is tailored for:

- Coastal
- Rivers and Waterways
- Ports and Harbors
- Water Management
- Mining
- Roads and Motorways
- Oil and Gas

Discover our solutions for your projects:

REINFORCED EARTH is now GEOQUEST