

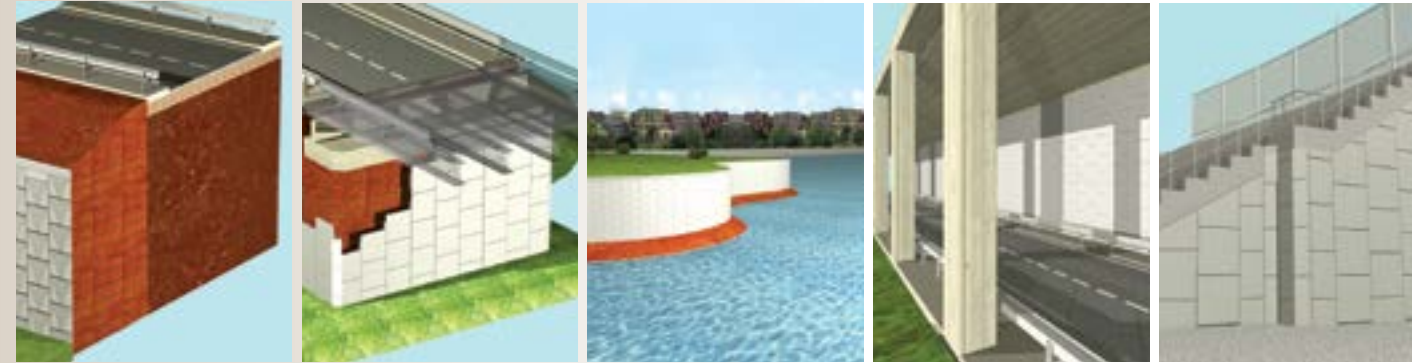
MACRES™

MacRes™ is Maccaferri's system for reinforced soil walls with vertical faced concrete panels as fascia element and suitable reinforcement. This system is ideal for the construction of vertical walls subject to high loads, or where architectural requirements demand a specific finish to exposed wall face. It is a tried and tested system and has been successfully adopted in adverse climatic conditions in different parts of the globe.



Flyover at ISCON, Ahamdabad, Gujarat, India

“ With the MacRes™ Solution, Maccaferri Provides Engineers and architects with an ideal option for vertical wall requirement subject to high loads which is aesthetically pleasing. ”



POSSIBLE FINISHES

The overcase is cast with suitable grade of concrete mix and required steel reinforcement.

The unique design of MacRes™ panel blends with the surrounding environment.



MacRes™ system is ideal for construction of Retaining structures due to inherent characteristics such as:

- M** Durability
- M** Overall cost effectiveness thanks to its simplicity and speed of installation
- M** Excellent connection strength between reinforcing element and fascia
- M** Outstanding performance under seismic conditions
- M** Ease of integrating the structure with surrounding environment (using different types of finishes)

APPLICATIONS

- M** Road Structures
- M** Hydraulic Works
- M** Railway Structures
- M** Mine Structures
- M** Civil Engineering



New overpass for bicycle, Arluno (MI), Italy



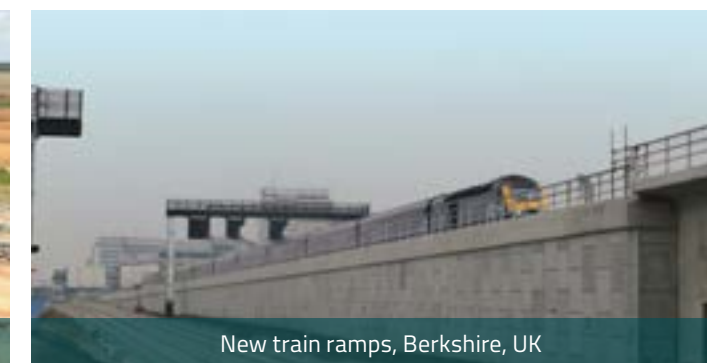
Water front application, Karnataka, India



New highway, Christiana, Delaware



Mina Constanciam, Peru



New train ramps, Berkshire, UK

“ Various types of finish may be used depending on the architectural requirements. ”



Sadlers Farm, UK



Le Puy-Paris, France



Corniche, France



Bridge van den azin, Antwerp, Belgium

MACCAFERRI STRENGTH

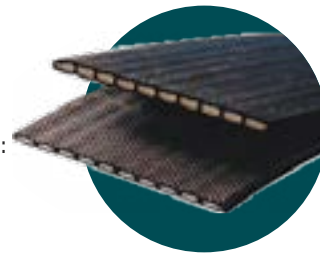
- M** Technical expertise
- M** Job site assistance on needs basis
- M** Post sale services
- M** Widespread presence throughout the country
- M** Manufacturing
- M** Research and development with research institutions and universities
- M** Pluri-certified products / system





REINFORCEMENT

The reinforcing elements are the key components of MacRes™ system. They satisfy the following characteristics:



- M** High tensile strength at low strain
- M** Durability
- M** Corrosion free
- M** Good soil bond
- M** Resistance against highly alkaline environment thanks to the durable LLDPE coating

PARAWEB®

ParaWeb® consists of discrete bundles of closely packed high modulus, low creep polyester yarns, lying parallel to each other, encased in a tough, durable polyethylene sheath. Polyester fibres carry the mechanical load while polyethylene sheath maintains shape of the material and provide durability. This parallel fibre structure and tough polymeric sheath ensures a combination of outstanding properties.

ParaWeb® is available in various strengths ranging from 30 to 100kN, this facilitates to optimize the design.

DRAINAGE

Providing proper drainage system is of great importance. Locking of water inside the structure shall impose extra water pressure and earth pressure due to reduction in shear strength of soil. This shall reduce the stability of structure and can even lead to catastrophic failure.

MACDRAIN®

MacDrain® geocomposite is realized by thermobonding a draining core in extruded monofilaments (GMA) with two filtering nonwoven geotextiles that may also be working as separation or protecting layers.

MacDrain® is a specifically designed drainage composite to meet the drainage and protection requirements in structurally demanding water draining applications. MacDrain® effectively eliminate hydrostatic pressure by collecting and conveying groundwater to a drain pipe for discharge. Drainage composites are prefabricated sub surface drainage products which directly replace the granular drainage layer.



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Engineering a Better Solution

Maccaferri's motto is **'Engineering a Better Solution'**; We don't merely supply products, but work in partnership with our clients, offering technical expertise to deliver versatile, cost effective and environmentally sound solutions. We aim to build mutually beneficial relationships through the quality of our service and solutions.

GLOBAL ENGINEERS

In the second half of the 19th century we invented Gabions and dramatically changed civil engineering landscape. We are still changing today. We work every day to find better solutions for our clients at every degree of latitude and longitude. Our worldwide network grows through innovation and diversification of sectors of activity and through an increasing range of high quality and environmentally friendly products and applications.

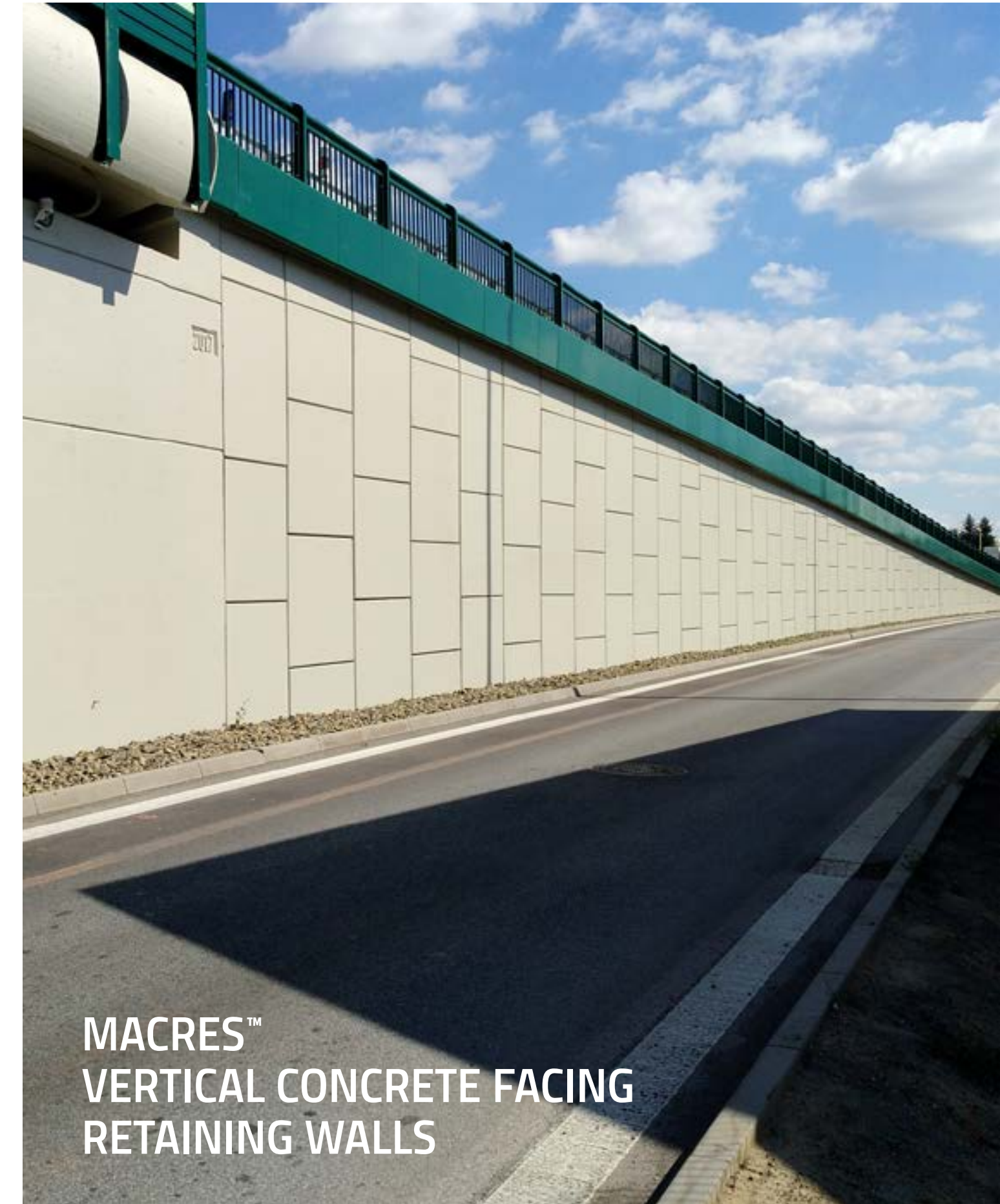
OFFICINE MACCAFERRI GROUP PROFILE

Founded in 1879, our Group soon became a worldwide reference in the design and development of advanced solutions, with offices in over 70 countries and 30 factories worldwide.

Our mission is to pursue excellence through continuous improvement, while delivering to customers engineered solutions that are innovative, advanced and environmentally friendly. We are committed to outstanding safety, quality and sustainability, to create value for all stakeholders as well as our communities.

MACCAFERRI APPLICATIONS

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| RETAINING WALLS & SOIL REINFORCEMENT | SOIL STABILIZATION & PAVEMENTS | DRAINAGE OF STRUCTURES | FENCING & WIRE |
| HYDRAULIC WORKS | BASAL REINFORCEMENT | TUNNELLING | AQUACULTURE NETS/ CAGES |
| ROCKFALL PROTECTION & SNOW BARRIERS | COASTAL PROTECTION, MARINE STRUCTURES & PIPELINE PROTECTION | LANDSCAPE & ARCHITECTURE | CONCRETE FLOORING, PRECAST & OTHER USES |
| EROSION CONTROL | ENVIRONMENT, DEWATERING & LANDFILLS | SAFETY & NOISE BARRIERS | INDUSTRIAL MANUFACTURING |



MACRES™ VERTICAL CONCRETE FACING RETAINING WALLS