



R o a d w o r k s

Problems and solutions

Gravity earth retaining structures

MACCAFERRI



Gabion earth retaining structures

Technical manuals define a retaining structure as any structure capable of resisting an applied soil pressure.

Retaining walls are permanent structures typically constructed at the toe of a slope or to retain backfill.

The planning and implementation of these structures must take careful account of several structural and functional considerations:

- Geomorphological conditions
- Analysis of the static and dynamic (seismic) forces present
- Presence of phreatic surfaces
- Costs of the completed structure

"Functionality" must include not only the overall environmental impact of the structure, but also the various local environmental mitigations and improvements that the entire road works should provide.

The variety of gabion applications, combined with the testimonial of existing gabion structures built since 1894, represents the reliability and reassurance that Maccaferri offers its clients. Over time, design standards and approaches have changed. What has not altered is the ability of Maccaferri gabions to perform as designed; fundamentally the structural stability and integrity, but in addition the capability to establish vegetation on the external facing.

The key to the longevity of these structures is obviously based upon the quality of the steel wire, but mainly due to the original idea of gabions. To combine the passive function (soil retention)



Italy

with the active function (the creation of a new local environmental equilibrium).

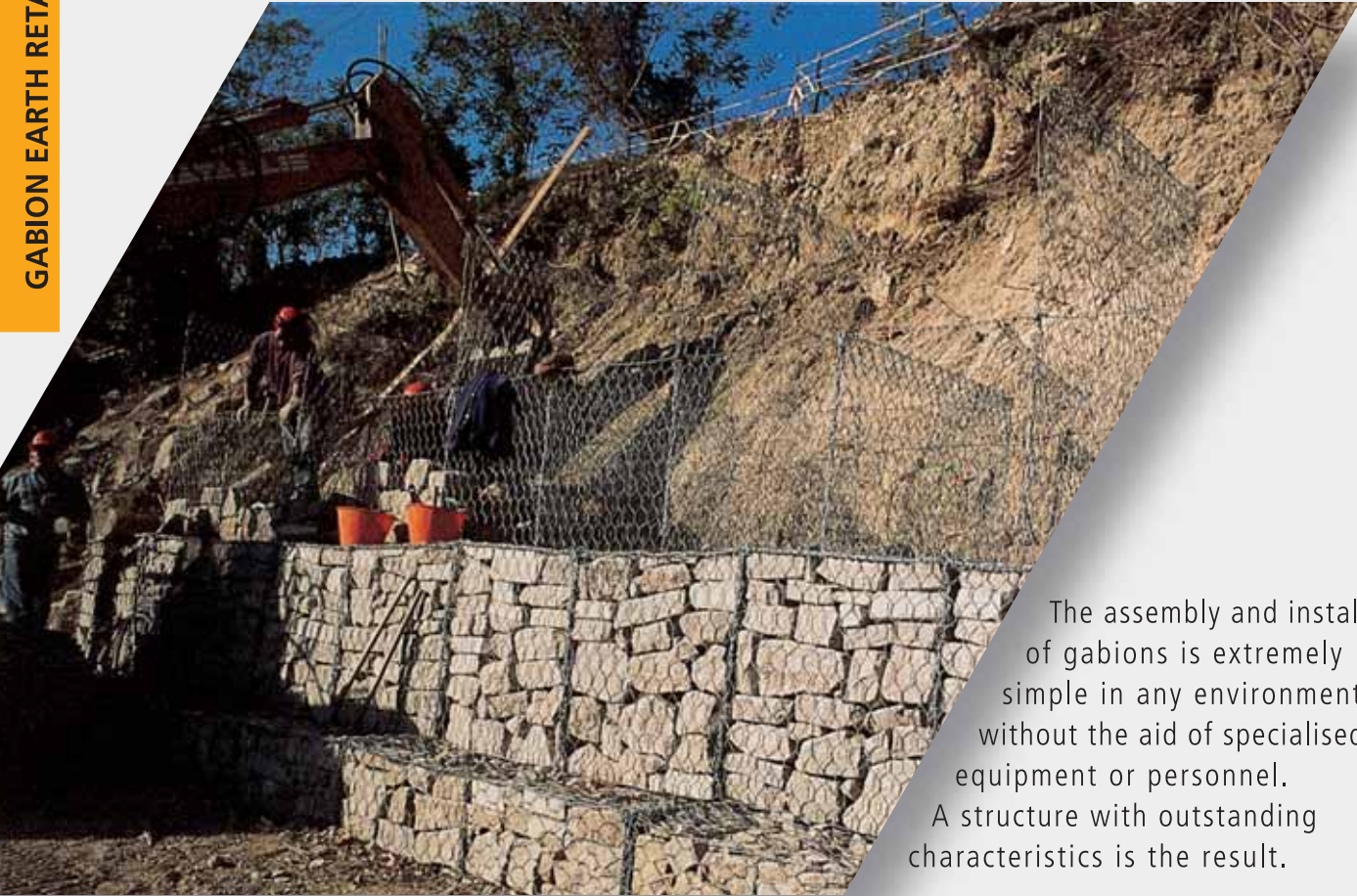
Gabion structures were, perhaps unconsciously in the beginning, the first historical examples of "environmental insertion" of an artificial structure.



Italy

Advantages and characteristics

- Robust •
- Flexible •
- Permeable •
- Durable •
- Versatile •
- Good environmental and aesthetic impact •



The assembly and installation of gabions is extremely simple in any environment without the aid of specialised equipment or personnel. A structure with outstanding characteristics is the result.

Italy

Italy



Reinforced structures

Gabion structures are capable of resisting any type of stress, in particular bending, tensile and shear.



Canada



U.K.



Portugal

Flexible structures

Gabion structures are capable of accommodating large differential settlements and unpredictable loads. These characteristics do not reduce the structural integrity, but improve it by promoting the interaction of the entire structure.



Italy



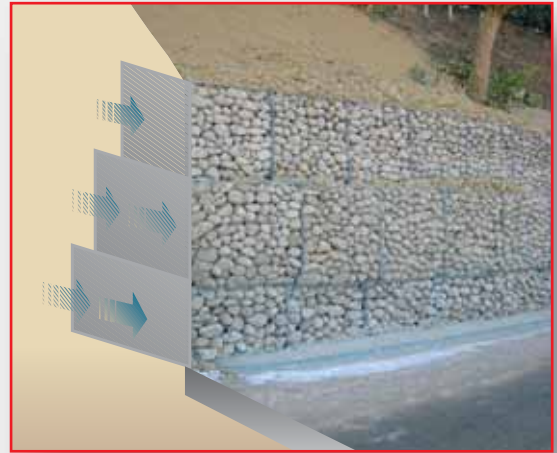
Poland



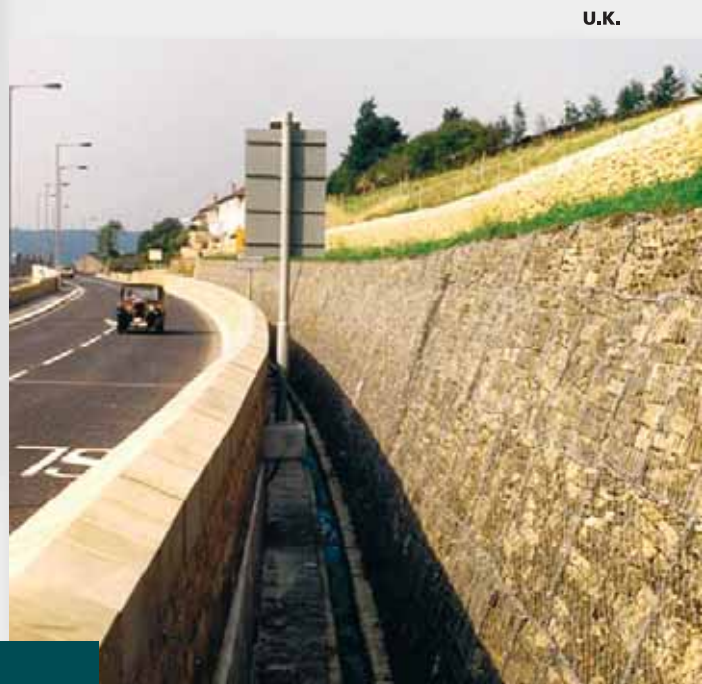
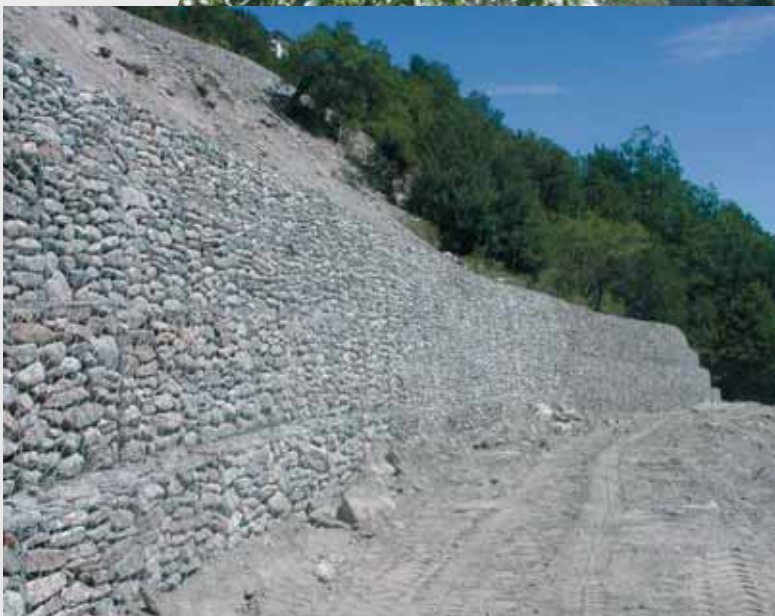
Italy

Permeable structures

The drainage capability of gabions is created by the voids in the gabion stone fill, which collect and transport water away from the structure, eliminating one of the main causes of soil instability: water logged backfills and/or foundation. Also, without formal drainage, the total cost for the structure is reduced.



Italy



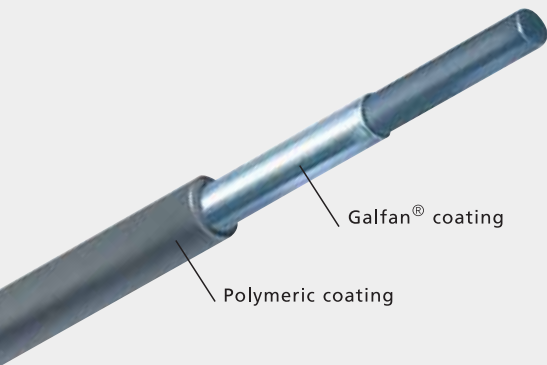
U.K.

Structure with long durability

The durability of the structure is dependent upon:

- Good natural integration with the backfill and retained slope
- Advanced technical characteristics of the steel wire and its Galfan (Zn-5% Al-MM) coating with an optional polymeric sheathing, all in accordance with the most stringent international Standards
- The use of hexagonal woven double twisted wire mesh which avoids any unravelling or unzipping of the mesh

These characteristics optimise the longevity of the structure, which has been certified by independent international bodies to offer a design life of over 60 years.



Italy

Fiji Islands



Versatile structures

- Ease of installation in any environment, without the aid of specialised equipment or personnel, reducing costs
- Future modification of the structure is straightforward; e.g. new layers can be installed to increase the height of the structure, (provided structural stability is verified)
- Immediate performance following installation
- Ease of maintenance

These benefits allow Maccaferri gabions to be used for most retaining structures alongside roads, railways and buildings where reliability and safety is paramount.



U.K.



Italy



U.K.



Italy



France

Good environmental and aesthetic impact

The opportunity to combine live plants with a high sound absorption capability, make gabion structures ideal solutions to balance engineering and environmental needs in the construction of roads and railways. The structural flexibility of Maccaferri gabions allows several interesting architectural possibilities for residential and commercial areas.



High acoustic absorption (~18 decibel)



Brazil



Italy



Italy



France

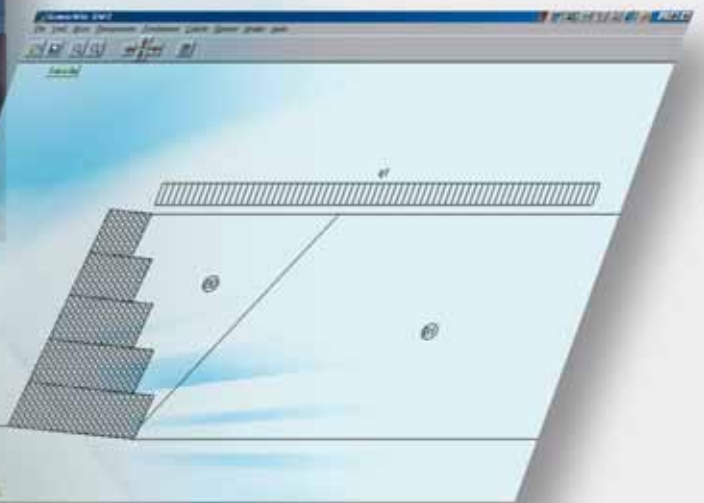
Design software

Laboratory and full scale tests carried out in partnership with the University of Bologna, have proved and calibrated the stability analyses of the Maccaferri Gawac design software.

The software takes into consideration

geometry, loads and other factors associated with the design of Maccaferri gabion structures in a wide variety of conditions.

Gawac graphically displays cross sections of the structure, the retained material, foundation, phreatic surfaces and external loads.





ANY REPRODUCTION INCLUDING PHOTOCOPY, FILM AND MICROFILM, IS FORBIDDEN. ALL RIGHTS RESERVED WORLDWIDE.

NEW ZEALAND	AUCKLAND (64) 9 634 6495	HAMILTON (64) 21 732 178	NAPIER (64) 21 916 736	CHRISTCHURCH (64) 3 349 5600		
	MELBOURNE (61) 3 8586 9111	SYDNEY (61) 2 8785 8800	NEWCASTLE (61) 2 4951 2688	COFFS HARBOUR (61) 2 6653 5706	PERTH (61) 8 6305 0561	ADELAIDE (61) 8 8162 5855
AUSTRALIA	HOBART (61) 3 6273 0511	BRISBANE (61) 7 3279 1588	TOWNSVILLE (61) 7 4774 8222	BUNDABERG (61) 7 4155 9968	GOLD COAST (61) 7 5594 8600	DARWIN (61) 407 523 669

0800 60 60 20
(Freephone NZ only)

GEOFABRICS.CO.NZ
GEOFABRICS.COM.AU

Follow Geofabrics on  

 **GEOFABRICS®**

The information contained in this brochure is general in nature. In particular the content of this brochure does not take account of specific conditions that may be present at your site. Site conditions may alter the performance and longevity of the product and in extreme cases may make the product wholly unsuitable. Actual dimensions and performance may vary. If your project requires accuracy to a certain specified tolerance level you must advise us before ordering the product from us. We can then advise whether the product will meet the required tolerances. Where provided, installation instructions cover installation of product in site conditions that are conducive to its use and optimum performance. If you have any doubts as to the installation instructions or their application to your site, please contact us for clarification before commencing installation. This brochure should not be used for construction purposes and in all cases we recommend that advice be obtained from a suitably qualified consulting engineer or industry specialist before proceeding with installation. This brochure is current as at the date printed below. Geofabrics New Zealand Ltd may make amendments to this document at any time. Please refer to our website, or contact our nearest sales office to ensure you have the most current version. © Copyright held by Geofabrics New Zealand Ltd. All rights are reserved and no part of this publication may be copied without prior permission.

