



NURTURING THE WORLD OF TOMORROW

Date February, 2022

MACCAFERRI

In the second half of the 19th century we invented **Gabions** and dramatically changed civil engineering's landscape. We are still changing it today.

We work every day to find better solutions for our clients at every degree of latitude and longitude. We make innovation happen around the world, we share our knowledge capital and we offer to our clients and partners ongoing support to establish relations built on solid trust.

This is us: **Maccaferri**.





Sales in
100+
countries



3,000+
employees



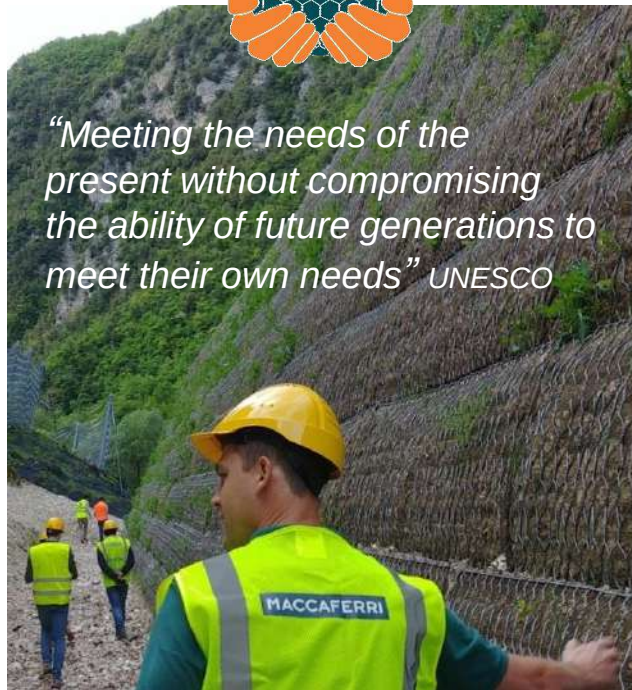
23
factories



60+
subsidiaries



“Meeting the needs of the present without compromising the ability of future generations to meet their own needs” UNESCO



VISION

Trusted global partner, **nurturing** the world of tomorrow, harmonizing life and nature through innovative solutions.

Nurturing for Maccaferri means to care, to protect, to be responsible for. Our vision is not just about ‘what’ we want to be but even more importantly it is also about ‘how’ we want to be as an organisation.

Responsible, respectful, caring, and sensitive not only to the **environment** but also very much to our **people**, our stakeholders and to the world at large.



MISSION

Pursue excellence through **continuous improvement** while delivering to our 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.

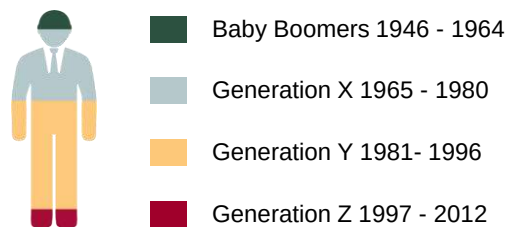
Internal initiatives towards a sustainable future

GENDER RATIO



Very good gender diversity* in a very technical sector (*women account for 28% of engineering graduates; UNESCO*)

GENERATIONAL DIVERSITY



Strong presence of young generations and good generational diversity in a very technical and traditional sector

SOME IMPACTFUL INITIATIVES

PRE-PANDEMIC SMART WORKING

Launched in 2019 (pre-pandemic period) in Italy and HQs, it is now a well established company process that enabled us to better respond to COVID challenges and to increase employees autonomy.

CONTINUOUS EDUCATION

Internal and external training programs to upgrade employees' skills thus enhancing personal growth and performance (incl. Young Engineers Program and e-learning platform)

PERFORMANCE EVALUATION & LEADERSHIP MODEL

Global Performance Evaluation tool based on self employees' assessment and managers' feedback. Leadership Model inspired to the most modern concept of leadership (self, people, change, business)

RECYCLING AND SINGLE-USE PLASTIC BAN

Attention to recycling in all plants and offices; introduction of single-use plastic ban in agreement with EU Directive 2019/904

SHUTTLE SERVICE

OM Employees access to a dedicated staff shuttle service; they will not need to stress about finding a way to and from work reducing the environmental burden related to transports

CERTIFICATIONS



Quality management system (ISO 9001) and environmental management system (ISO 14001) certified. Our suppliers declared their compliance with REACH Regulation on use of chemicals (EU based supplier)



Maccaferri solutions provide **environmental**, **social** and **economic** benefits mitigating natural and anthropogenic hazards, respecting the environment, enhancing people safety and improving their lives.

OUR COMMITMENT TO TRANSFORM OUR SECTOR

MACCAFERRI

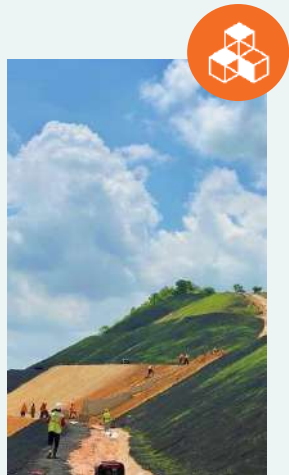
17 Sustainable Development Goals (SDGs)



We believe that companies as well as authorities and institutions have the duty to devise and deliver solutions that do not jeopardize the longevity and security of **people** and the **environment**.



The UN set the SDGs as an urgent call for action: we took on the challenge and committed ourselves to achieve them **one by one, step by step**.



Foster innovation

Continuous improvement through engineering test campaigns and product performance evaluation



Responsible design and production

Sustainable material management, with re-use and recycling of materials.
Our solutions cause no harm to the environment



Promote clean energy adoption

Working to maximize the share of green energy in the global energy mix



Integration into the natural environment

Enhancing biodiversity
Respecting the wildlife
Boosting vegetation growth



Safety of people and assets

Preserving our cultural heritage, improving public safety and preventing disaster risks



Involvement of local communities

Promoting an inclusive growth and restoring livelihood and economies after natural disasters

BENEFITS OF OUR ACTIONS

MACCAFERRI



LESS MATERIALS AND EMISSIONS



TRANSPARENCY



PROTECTING WILDLIFE & BIODIVERSITY



BOOST VEGETATION GROWTH



LONG TERM DESIGN APPROACH



REUSE OF SITE-WON MATERIALS



PROTECTION OF PEOPLE AND ASSETS



INVOLVEMENT OF LOCAL COMMUNITIES



PRODUCTION OF CLEAN ENERGY



RECYCLED MATERIALS



PRESERVING CULTURAL HERITAGE



RESTORATION AFTER DISASTER EVENTS

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



FOSTER INNOVATION

We encourage a continuous improvement to put the long-term economical and environmental impacts of a structure at the centre of the design activity.

Our design process is focused on test campaigns and investments in performance evaluation of our solutions.

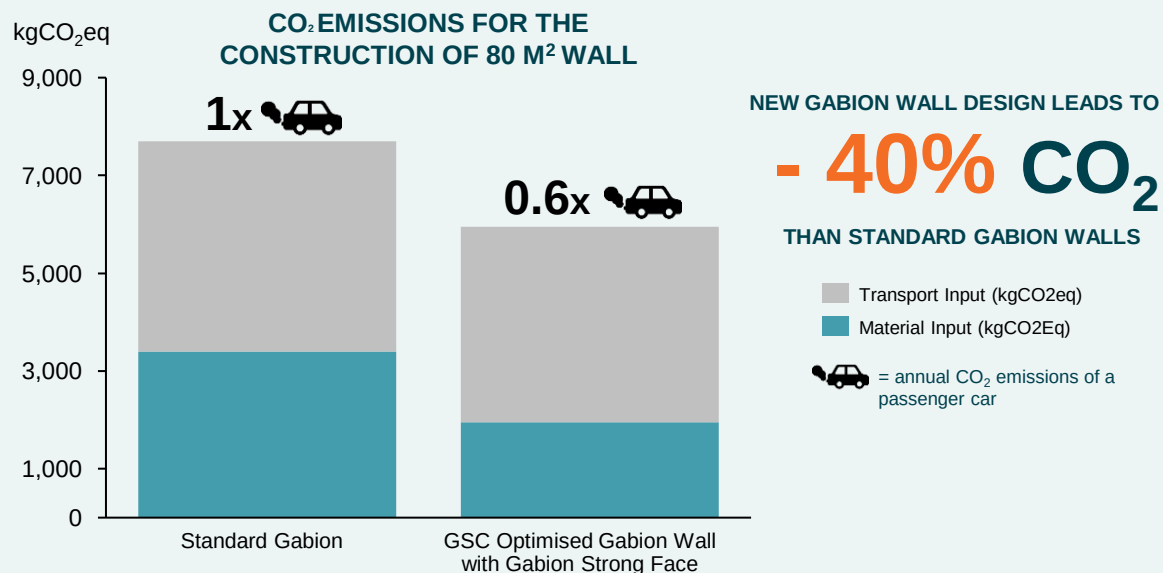
LONG TERM BENEFITS

We put the long-term economical and environmental impacts of a structure at the center of our design activity.

WHAT WE ARE PROUD OF

In 2021 we launched a new design approach for design walls that introduces the concept of service life and long-term impacts of the wall.

Based on experimental test campaigns, the new method increases the effectivity of the wall in the long-term considering its performance over time thus leading to substantial economical and environmental benefits.



DATA SOURCE: APMC (2012) *Carbon Footprint dei Gabbioni e Materassi Maccaferri: confronto con soluzioni tradizionali* (unpublished). Ask Maccaferri for the full report.

ENCOURAGE

We encourage innovation and substantially focusing on how our solution can bring in long term economical and environmental benefits for our stakeholders.

WHAT WE ARE PROUD OF

The use of Reno Mattress™ Plus reduces the environmental footprint of riverbank protection compared with traditional rip-rap solutions. This is due to savings of materials, transport.

AS BUILT



AFTER YEARS



RENO MATTRESS PLUS LEADS TO

- 82% CO₂

EMISSIONS THAN RIP RAP SOLUTIONS*

Since Reno Mattress™ enhances the vegetation growth, it additionally produces a **carbon sequestration** of 0.46 kgCO₂/m² per year**.

*Data are based on Environmental Product Declaration (EPD). Figures refer to specific field condition (shear stress 400 N/m²). Additionally, not considered in the graph, Reno Mattress enhances the vegetation growth further increasing the environmental benefit of the solution.

** APMC, 2012. *Carbon Footprint dei Gabbioni e Materassi Maccaferri e confronto con soluzioni tradizionali*

12 RESPONSIBLE CONSUMPTION AND PRODUCTION



RESPONSIBLE DESIGN AND PRODUCTION

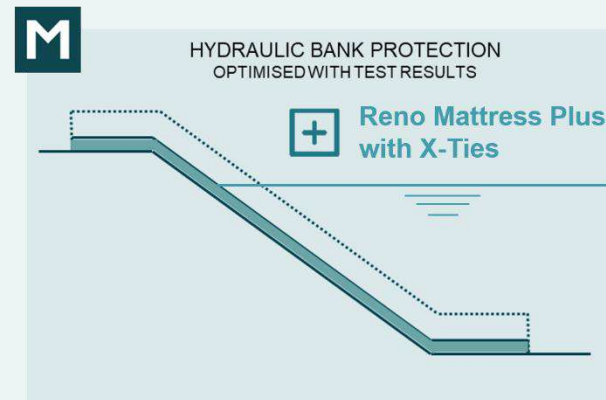
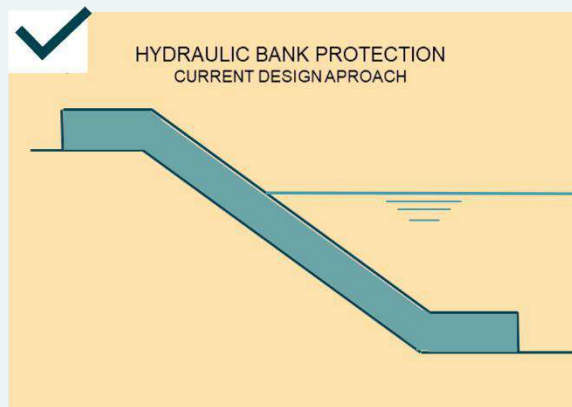
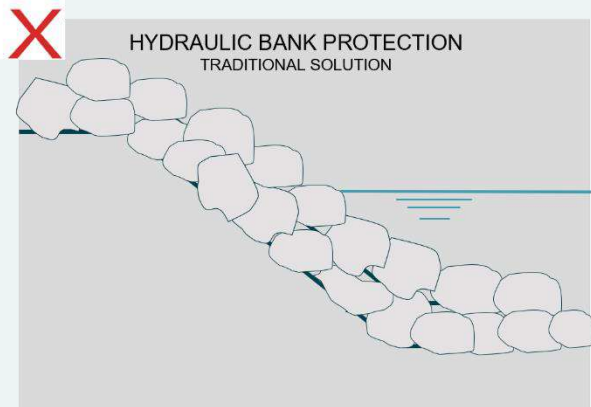
Through design optimization we promote a sustainable material management to save resources and avoid waste. Our achievements involve reduction, re-use and recycling of materials.

Also, we commit to transparency, providing objective, reliable and comparable information about the life-cycle environmental impact of our products.

REDUCE | We prioritize the optimization of our solutions in order to save time and resources. Our aim is to lower their environmental impact while maintaining their excellent performances.

WHAT WE ARE PROUD OF

Reno Mattress™ Plus is the result of a 3-years physical test campaign and it can bring **materials savings over 70%** when compared to an alternative in Rip-Rap. Less stones means **less CO₂ emissions**, less truck movements and therefore a reduction in environmental footprint of riverbank protections.



REDUCE Improving circularity and cutting greenhouse gas emissions is possible: to achieve that, an efficient materials management is necessary and material waste must be avoided.

WHAT WE ARE PROUD OF

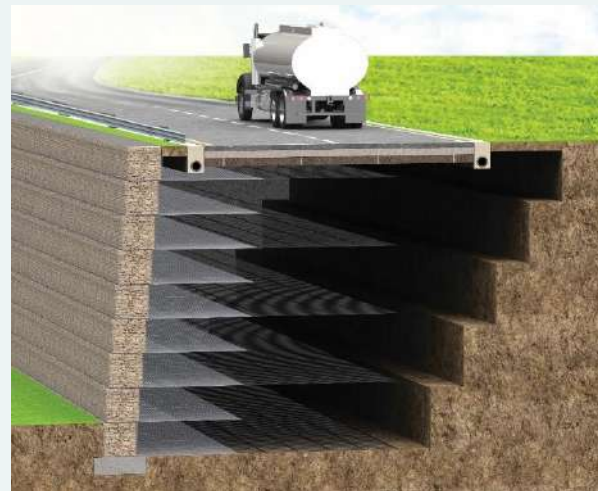
Prefilled solutions like RenoMac and Cubiroc were developed to make underwater installation of gabions and mattresses more sustainable. They considerably **reduce material waste**, both during the filling and the laying process.



REUSE | We promote the reuse of «site-won» materials to reduce the environmental impact of raw materials and the polluting emissions associated with transport.

WHAT WE ARE PROUD OF

We have a wide range of geogrids to maximize the opportunity to reuse site-won materials as backfill to reinforce soil walls and slopes.



REUSE | Combining different projects is the key for a better material management and to improve the sustainability of each one of them.

WHAT WE ARE PROUD OF

The pilot project between Maccaferri and Voyes Navigable de France allowed the use of **dredged materials** from a waterway to fill a Reno Mattress™ for riverbank protection.



RECYCLE | Starting from the manufacturing of our solutions, sustainability can be achieved through the use of recycled materials.

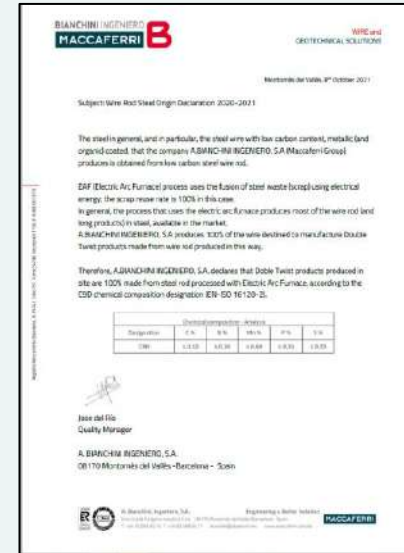
WHAT WE ARE PROUD OF

For **steel wire mesh** a target has already been achieved because most of the steel rods used to produce the steel wire come from steel recycling.



Recycled Steel

Long lasting and sustainable **polymer coating** extends the service life of a structure



Raw steel materials are certified to not come from blast furnace production.

REDUCE AND RECYCLE

Innovative technologies combine different functions in one solution, and they can be manufactured with recycled materials.

WHAT WE ARE PROUD OF

Maccaferri drainage geocomposites could be manufactured **from recycled polymers** and they can provide one or more main functions: filtration, drainage, separation, barrier and protection.



The use of MacDrain™ for horizontal drainage applications can lead to **over 80%** of material savings.

TRANSPARENCY | We increase sustainability also providing objective, reliable and comparable information about the life-cycle environmental impact of our products.

WHAT WE ARE PROUD OF

An **Environmental Product Declaration (EPD)** is an independently verified and registered document that communicates transparent and comparable information about the life-cycle environmental impact of products.



CERTIFIED ENVIRONMENTAL PRODUCT DECLARATION

S-P-01461 S-P-01464 S-P-01467 S-P-01470 www.environdec.com
S-P-01462 S-P-01465 S-P-01468 S-P-01471
S-P-01463 S-P-01466 S-P-01479



Maccaferri design activities are also covered by **ISO 14001** certification.

7 AFFORDABLE AND CLEAN ENERGY



PROMOTE CLEAN ENERGY ADOPTION

We develop solutions that foster the access to clean energy.

We work in partnership with authorities to maximize the share of green energy in the global energy mix.

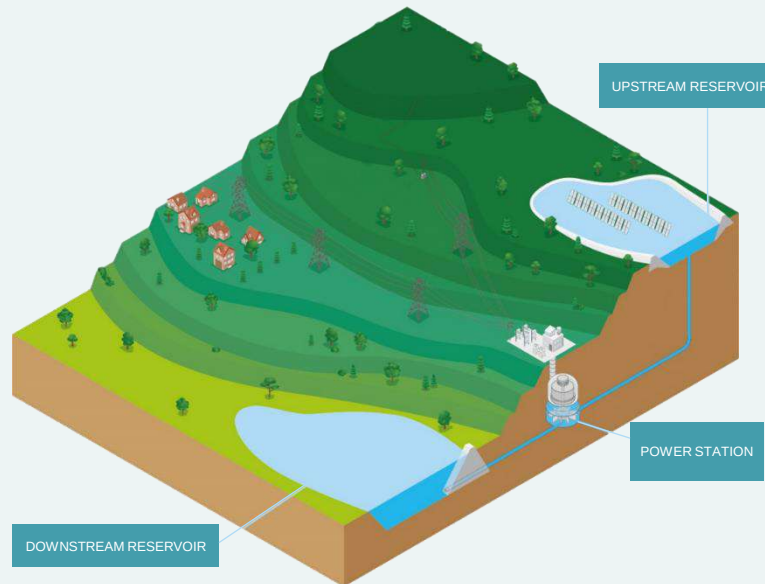
CLEAN ENERGY ADOPTION

We help our stakeholders to meet their energy needs in a more sustainable manner.

WHAT WE ARE PROUD OF

Our solutions are widely used to create naturally integrated reservoirs for the agriculture and green energy production.

We recently participated in the development of a national scheme of reservoirs to be used not only as water resource for agricultural applications but also for the production of green energy (solar, hydro).



L'Aquila, Italy

14 LIFE
BELOW WATER**15** LIFE
ON LAND

INTEGRATION INTO THE NATURAL ENVIRONMENT

We endeavour to reduce the environmental impact of our solutions and to achieve a balance between the technical performance and the natural integration.

One of our commitments is to favour solutions that enhance biodiversity, providing perfect habitats for different species, and also consider the presence of wildlife and respect it.

LIFE BELOW WATER

Our solutions are designed to integrate into the natural environment, enhancing biodiversity and providing perfect habitats also for endangered species.

WHAT WE ARE PROUD OF

Polymer coated Reno Mattresses™ were installed in Knysna Basin (South Africa) for scour protection.

Several studies have been carried out on the endangered Knysna **seahorse** *Hippocampus capensis*.

The findings suggest that artificial Reno Mattresses™ provide novel **habitats** for this endangered species, highlighting the usefulness of these structures in future conservation activities.



Cape Town, South Africa

LIFE ON LAND

Our goal is to deliver safe solutions that integrates into in the environment, in a way that considers wildlife already living around it.

WHAT WE ARE PROUD OF

Animal burrowing causes failure of riverbanks. Traditional damage reduction methods for rodents involves lethal approaches to reduce the densities.

Double twist wire mesh has proven to be effective against burrowing. We developed RenoMesh to protect the riverbank but also to create dedicated areas where **burrowing animals** can dig their lodges without affecting the stability of the riverbank.





13 CLIMATE ACTION



11 SUSTAINABLE CITIES AND COMMUNITIES



INTEGRATION INTO THE NATURAL ENVIRONMENT

We care about naturalization of our engineering structures, and we believe that integrating vegetation and planting techniques at the design stage is an additional ecological value of our solutions.

We work to improve the overall aesthetics of our structures, to better integrate them in our urban environments.

CLIMATE ACTION

Enhancing the vegetation growth into our solutions additionally produces a carbon sequestration that improves their environmental footprint.

WHAT WE ARE PROUD OF

Our solutions are living systems with shapes and colors of vegetation and natural life.

Introducing vegetation into our solutions improves the overall **aesthetics** and has **environmental benefits** also in urban environments. In addition to carbon sequestration, natural solutions better absorb noise and reduce heat reflection, which is important to reduce overall energy consumption.

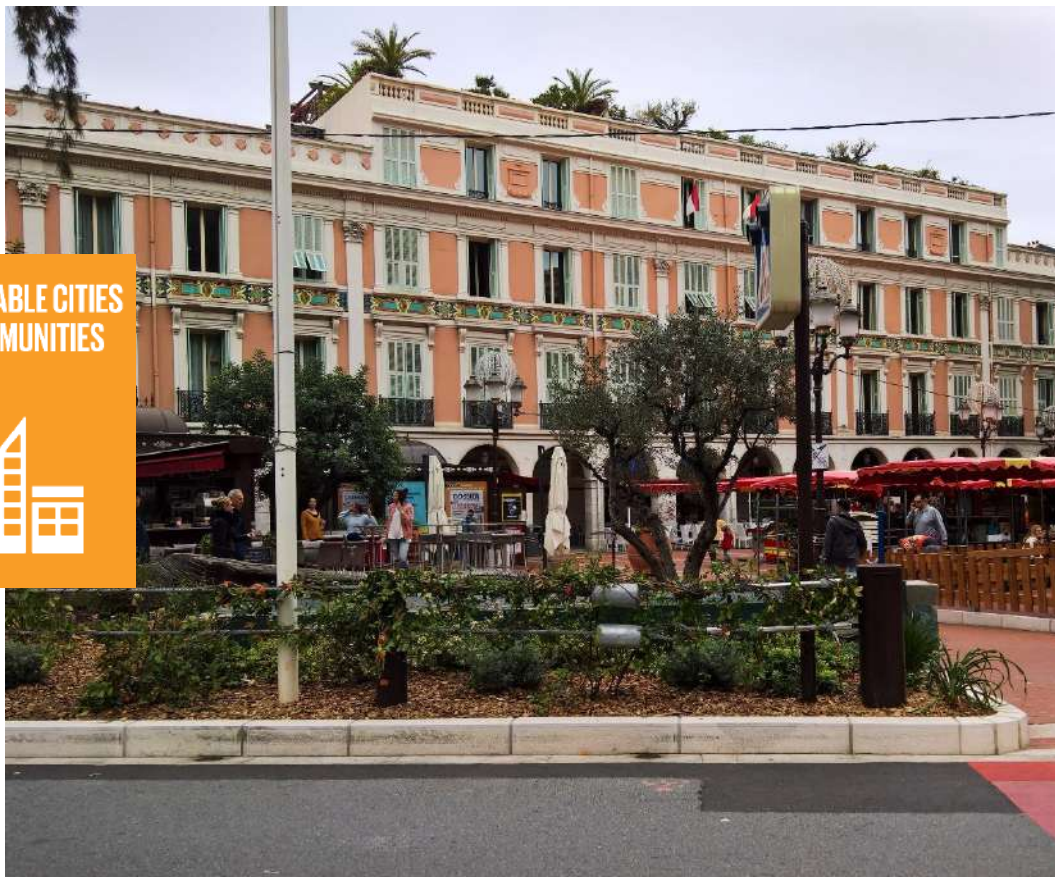


Istanbul, Turkey



Dar es Salam, Tanzania

11 SUSTAINABLE CITIES AND COMMUNITIES



SAFETY OF PEOPLE AND PROTECTION OF ASSETS

Developing customized solutions for each safety problem we are facing allows us to minimize risks.

People, historical and cultural heritage and infrastructure must be protected.

PROTECTION | Our solutions for protection of historical sites, monuments and other famous landmarks were developed to be in sympathy with their surroundings.

WHAT WE ARE PROUD OF

Terramesh™ systems have been used in various locations within the Historic Centre of **Rome (UNESCO World Heritage)**. Aesthetically pleasant and unobtrusive walls were designed to protect the **Ancient Romans ruins**.



Rome, Italy

SAFETY | Providing access to safe and accessible public spaces.

WHAT WE ARE PROUD OF

Vehicle access prevention plays a critical role in **counter terror strategy** and our new system has been developed in response to a need to continuously improve public safety.

A recent installation in **Nice** is designed to stop a 19-ton truck travelling at 50 km/h. The system is crash test rated and accredited by the IUAV (University of Venice).



Nice, France

DISASTER RISK PREVENTION | We develop customized measures for each safety issue we are facing, in order to minimize the risk of a disaster event and to protect people and assets.

WHAT WE ARE PROUD OF

Twice a year the devotees' throng to Saptshrungi's temple in large numbers for worship and approximately 3000 pilgrims pay a tribute to this holy place daily.

Multiple protection measures were installed to protect the temple, the pilgrims and the access infrastructure against rockfalls. The height of cliff to be protected was about 200 meters from the road level.



Saptshrungi, India

The alarming rate of occurrence and severity of natural disasters around the world led us to develop **new additional measures** to face the exposure to risks.

8 DECENT WORK AND ECONOMIC GROWTH



INVOLVEMENT OF LOCAL COMMUNITIES

We promote an inclusive growth, developing solutions that can be easily installed by local manpower without any special training.

Many communities suffer for an increasing number of natural disaster events, therefore we work on quick and effective measures to intervene and to restore their economies.

LOCAL LABOUR

Our solutions can be installed by unskilled workers allowing the involvement of local people in the construction process, giving them the chance to work and to learn new skills.

WHAT WE ARE PROUD OF

The Awash-Weldia/Hara Gabaya Railway Line is one of the biggest projects implemented in Africa over the past few years.

The use of Reno Mattresses™ and Gabions for the scour protection of the railway bridges enabled the involvement of **local manpower**. This would not have been possible if concrete or big boulder scour protections were designed.

Also, the filling of these solutions can be carried out using only local resources and **local available materials**.



Awash-Weldia/Hara Gabaya, Ethiopia

RESTORATION WORKS | With an increasing number of natural disasters worldwide, we believe it's important to intervene quickly and effectively, in order to give local people their life back.

WHAT WE ARE PROUD OF

Hurricane Maria is considered the worst hurricane that has ever happened in Puerto Rico. Because of hurricane Maria, the island of Puerto Rico suffered more than 600 failure slopes. In Guayama, due to the heavy rains, a full section of a road collapsed.



We were involved in the project of the restoration of several infrastructure and **revitalization of livelihood and economies** to make communities less vulnerable to future disasters and increase their resilience. Several roads were stabilized with the use of gabions, Terramesh™, Green Terramesh™ or MacMat™ R.

WORKERS SAFETY | Large numbers of people are engaged in hazardous activities in construction jobsite; we have developed procedures and solutions that minimize workers exposition to risks

WHAT WE ARE PROUD OF

In tunnelling excavation activities, workers at the excavation face are exposed to considerable safety risk.

We have developed a tunnel support system (B.ZERO Tondo tubular semi-automatic steel rib) that minimizes the need of workers at the excavation face.

Together with its dedicated automated erector machine, B.ZERO Tondo has been engineered to meet the construction demand for a more effective, easier to install and safer solution than the conventional open profile steel ribs. Compared to conventional primary supports, the structural efficiency of the system delivers a higher performance and a shorter installation time.





A 50-m high wall in a
UNESCO Biosphere
Reserve
Shennongjia Airport,
Hubei Province (CN)



NON-INTRUSIVE MEGASTRUCTURE

MACCAFERRI

A 50-m high wall within an UNESCO Biosphere Reserve



The project is a large cut and fill exercise in order to insert the 2,800m runway and airport buildings.

To stabilize and reinforce the 'fill' side of the project, Terramesh™ and MacGrid™ WG were used. The reinforced soil wall reached nearly 50 m high.

OUR UNIQUENESS

The system **reused site won materials as structural backfill**. More traditional solutions would have been difficult to construct, costly and not as ecologically friendly.



Rockfall mitigation works
around a temple in
Saptshrungi, India



THE SOCIAL IMPACT

Protection of temple, pilgrims and railway from rockfall



A site of hindu pilgrimage affected by rockfall by adjacent hill slopes.

Rockfall protection measures were installed to protect the temple the pilgrims and access infrastructure.



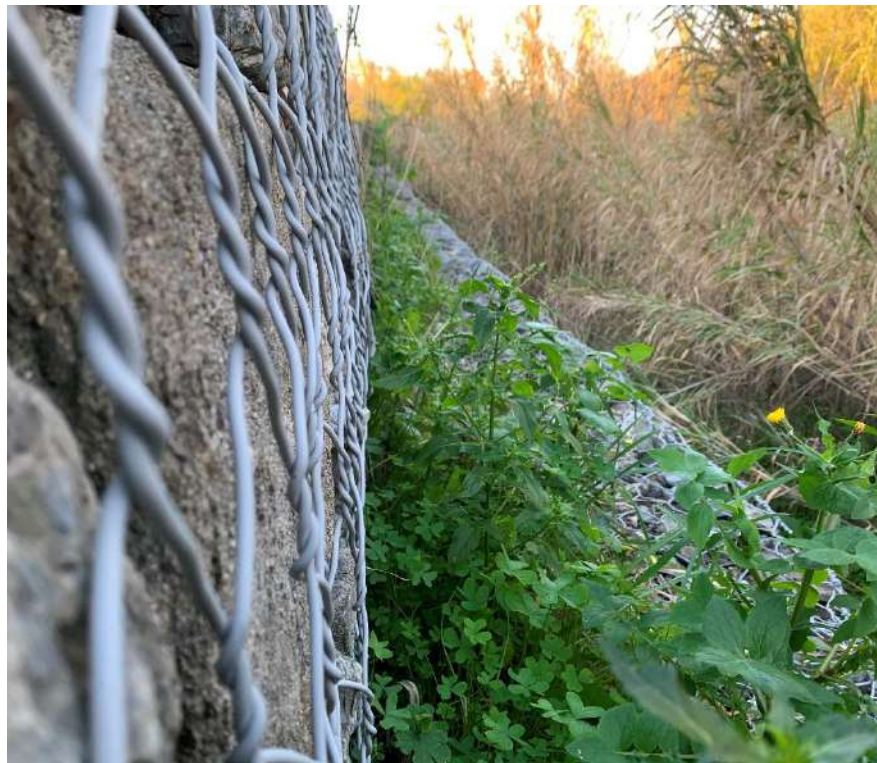


Naturally sound river bank
protection, Italy

ONE WITH NATURE

MACCAFERRI

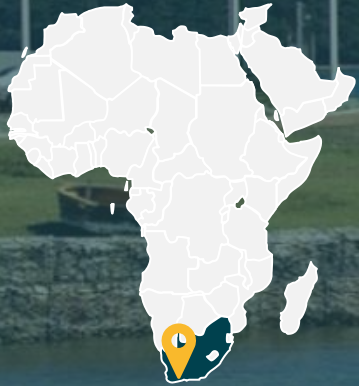
Being part of the environment without harming it



The protection of riverbanks from erosion due to river water flow is a common hydraulic applications. In addition to the strengthening of the bank, our solution perfectly fit the surrounding environment.

OUR UNIQUENESS

Reuse of **locally available stones** and overall structure porosity that enable it to **integrates into the environment**.



Marina Development
within Knysna Estuary,
South Africa





In one of South Africa's most important areas in terms of biodiversity, seventeen kilometers of pristine waterfront property needed to be protected in the most possible environmentally-friendly way against tides and waves.

Our Gabions and Reno Mattress were selected as the most suitable option.

OUR UNIQUENESS

Our solutions create a natural habitat for living species, enhancing biodiversity through the protection of the benthos.



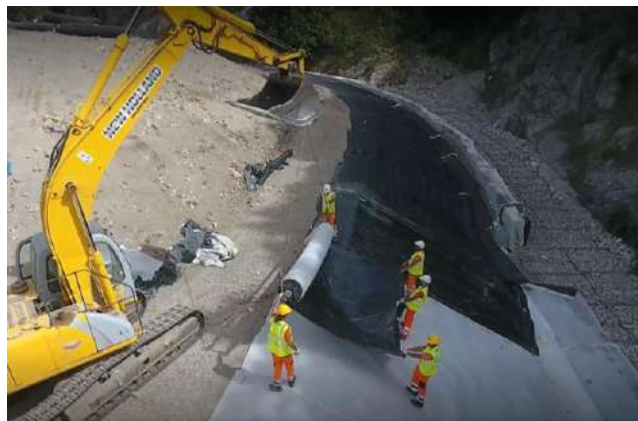
Geosynthetic
multicomposite for
landfill capping,
Cava de' Tirreni, Italy





A significant recovery and securing plan for an abandoned landfill was needed. The lack of an impermeable cover caused leaching and polluting of a nearby watercourse, making the landfill a threat to the health of people and the surrounding environment.

We provided a 3-in-1 solution which combines the functions of separation, drainage, erosion control and soil reinforcement.



OUR UNIQUENESS

Installation time and therefore **CO₂ emissions** were drastically reduced. Also, this multi-layer solution guarantees **durability** and **solidity** over time.

BACK UP

THE 17 SUSTAINABLE DEVELOPMENT GOALS

MACCAFERRI





We continue to demonstrate our attention to **sustainability** and the **environment** by supporting the artist Maria Cristina Finucci, author of the “Help the Planet, Help the Humans”

The aim of her work is to better inform the public about the existence of vast assemblages of plastic material in the oceans, called the Garbage Patch – one of the most serious phenomena of environmental pollution.



OUR INITIATIVES

The Installation during *Fuori Salone* week in April 2019 at University of Milan. To form the huge inscription "**HELP**" over two tons of colored plastic caps enclosed in bags of red nets for food and enclosed in 65 PoliMac gabions.



The 2018 Installation at the Fori Imperiali in Rome.