



PRE-ASSEMBLED EARTH RETAINING SYSTEMS: THE TERRAMESH FAMILY

Date
Author

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Paolo Di Pietro

MACCAFERRI

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5' Introduction

15' The TerraMesh Family

10' Installation, design software and certified quality

10' Our best projects around the world

5' Conclusions

Q&A Session

Speaker: Paolo Di Pietro

DT Business Unit – Senior Specialist

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When it comes to **weak soils** that need to support **high loads** or many loading and unloading cycles, the structures must be designed with great precision and constructed with quality materials.





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Productivity on construction sites has always a great impact on a project's success.

Sometimes, emergencies like floods and landslides require a **rapid intervention** to contain damages.



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Retaining walls and soil reinforcement solutions sometimes need to reach great heights while keeping a small ground footprint.

The **lack of space** can lead to a great challenge when designing these structures.





Often, the **scarcity of materials** and the limited access to the construction site can represent an issue in constructing soil reinforcement structures.

To reach a greater sustainability and a lower total cost of ownership, solutions need to have the longest design life.

Especially in those regions with more aggressive climates, choosing the right type of structure and materials can be crucial when it comes to **durability**.





MACCAFERRI

When designing engineering solutions, the environmental impact of every structure needs to be considered.

The best solutions are the ones that combine great performance with **environmental integration**.



TerraMesh Mineral

Rise to the challenge

THE TERRAMESH FAMILY

MACCAFERRI

Why is TerraMesh the best?



The TerraMesh solutions are fabricated from a double twisted steel wire mesh: the facing is integrally manufactured with the DT soil reinforcement. As a **continuous piece of woven mesh**, **no connections** are needed and therefore there are no weak points.



THE TERRAMESH FAMILY

MACCAFERRI

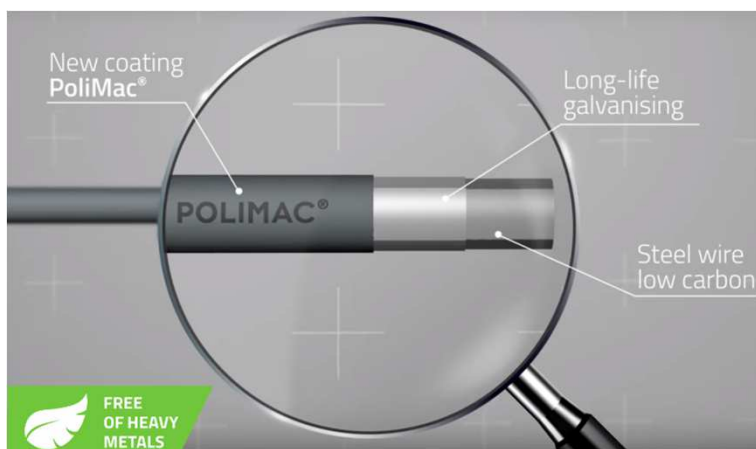
Why is TerraMesh the best?



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All the TerraMesh solutions are made of **PoliMac** coated wire mesh. PoliMac is a revolutionary coating that allows a great increase in **durability**, even when the climatic conditions are particularly aggressive.



PoliMac®
WIRE PROTECTION FOR A CHANGING WORLD

12x

Better resistance to **abrasion**, including installation damages



2x

More resistance to **chemical aggressions***



4x

More performance in **cold weather**



4x

More resistance to **UV rays****



* In terms of resistance to sulphuric, nitric, formic, acetic acids

** In terms of elongation after 2500 hrs of exposure

Why is TerraMesh the best?



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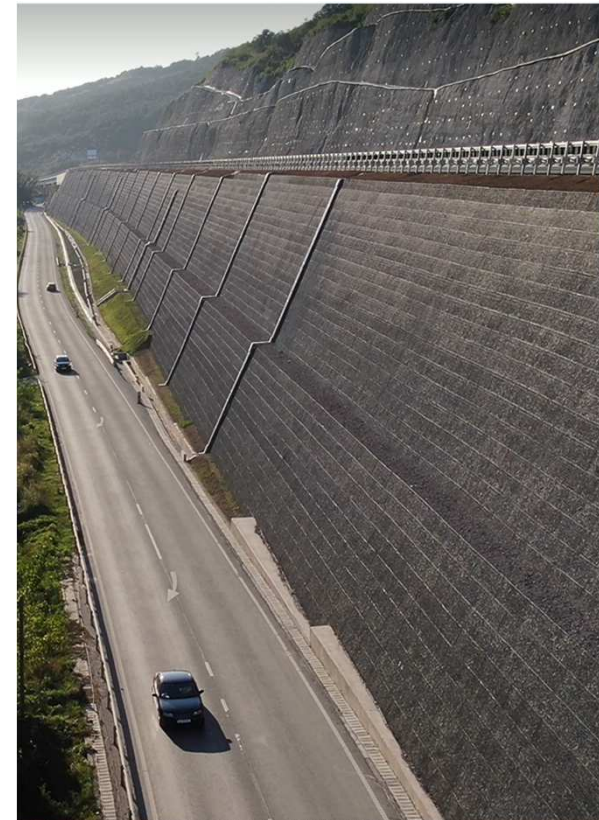
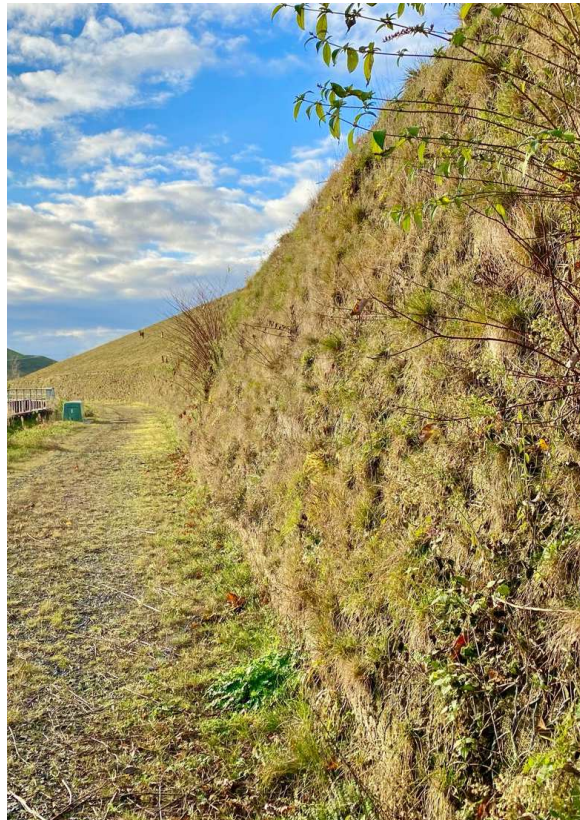


Reinforcing soils with the TerraMesh family in conjunction with our **Paraproducts** enables them to stand higher and steeper, to accommodate higher loads and to reuse on-site soils. There is no need for mechanical connections!



THE TERRAMESH FAMILY

MACCAFERRI



THE TERRAMESH FAMILY

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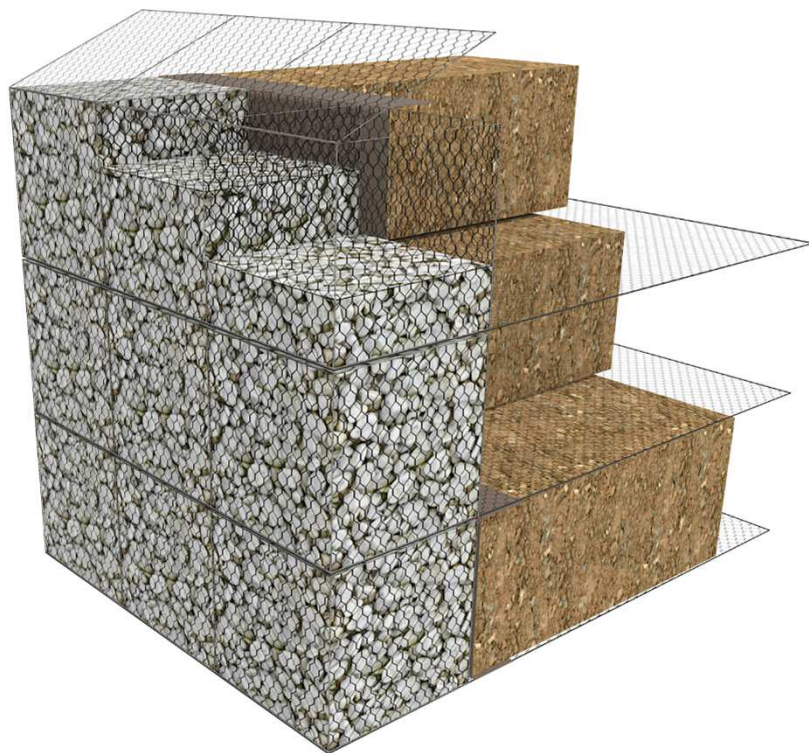


TerraMesh System
Rise to the challenge

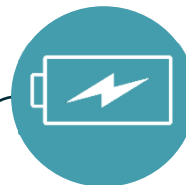


TERRAMESH SYSTEM

MACCAFERRI



TerraMesh System is a modular system used to form a rock-faced mechanically stabilized earth wall with vertical facing.



120
YEARS
DESIGN
LIFE



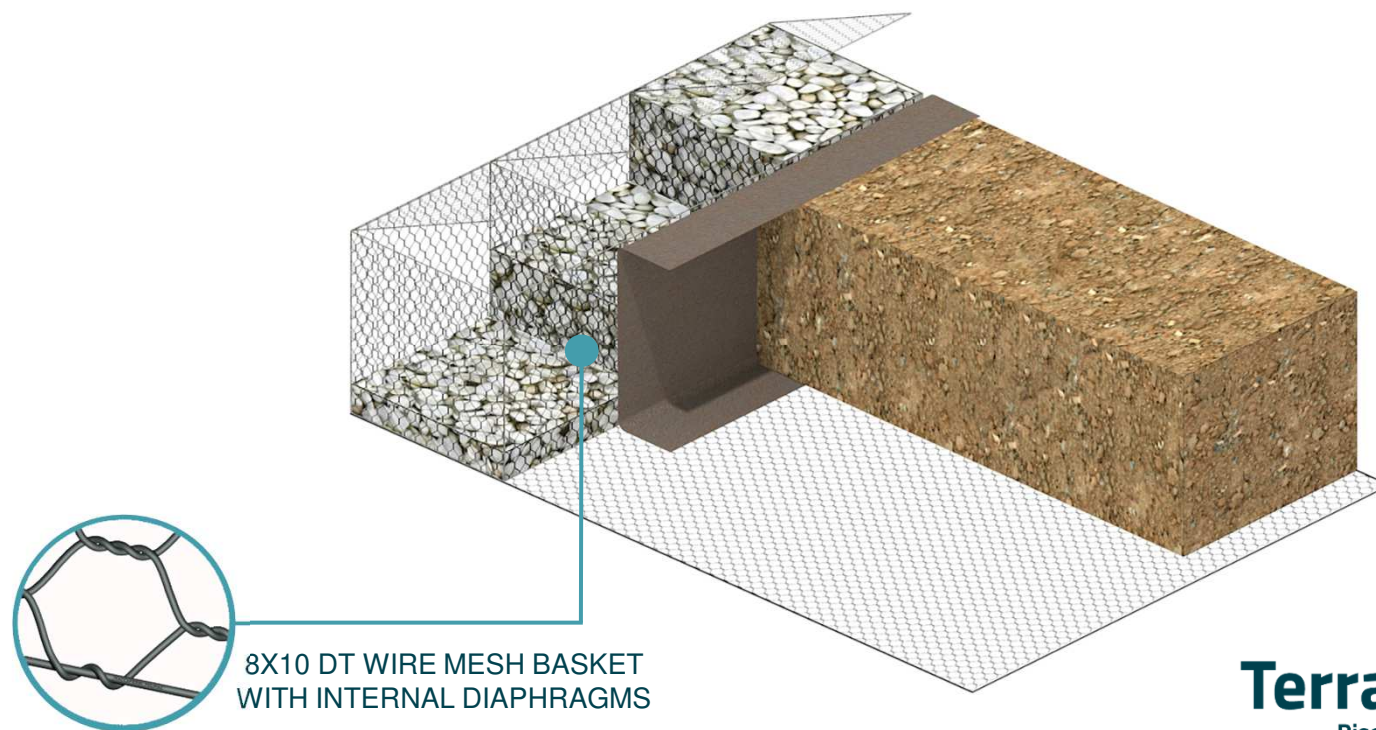
50 m²
INSTALLED
IN A SHIFT



GREAT
PERFORMANCE
UNDER HIGH
LOADS

TERRAMESH SYSTEM

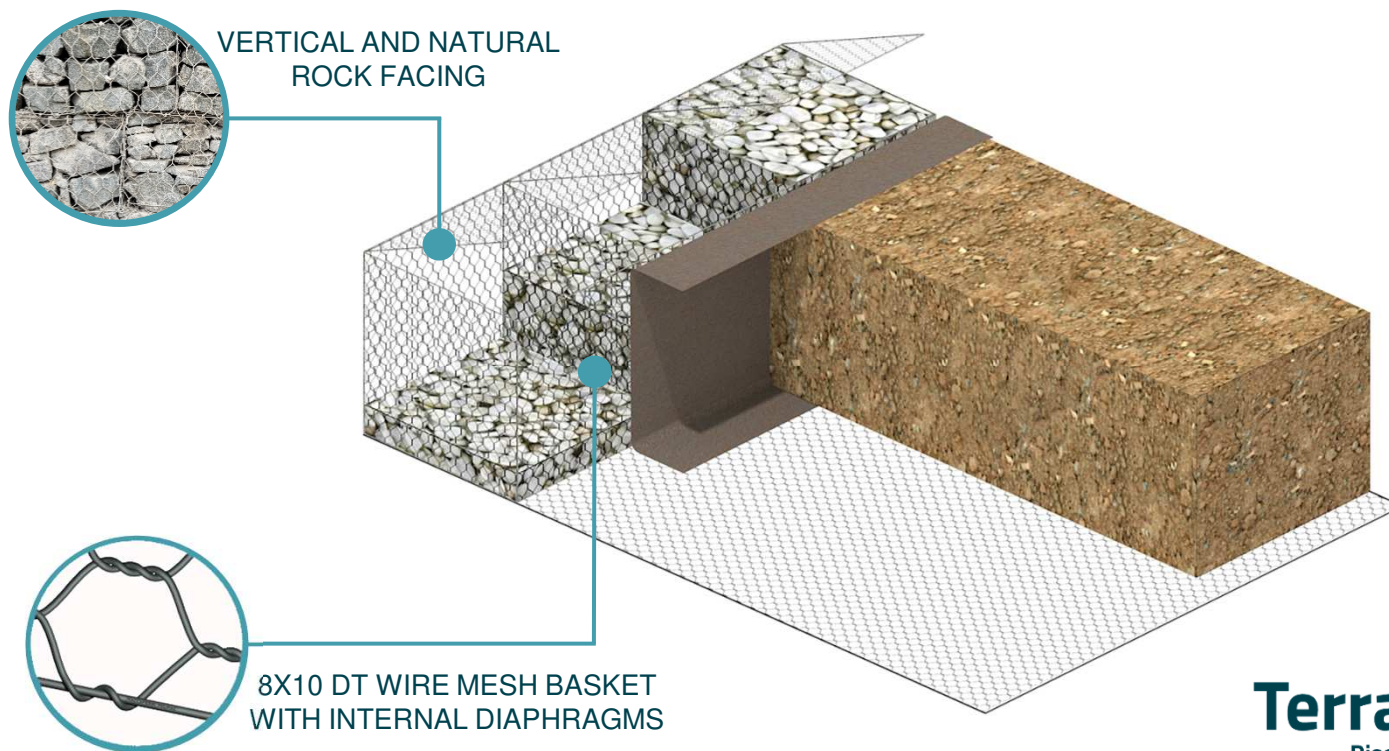
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TerraMesh System
Rise to the challenge

TERRAMESH SYSTEM

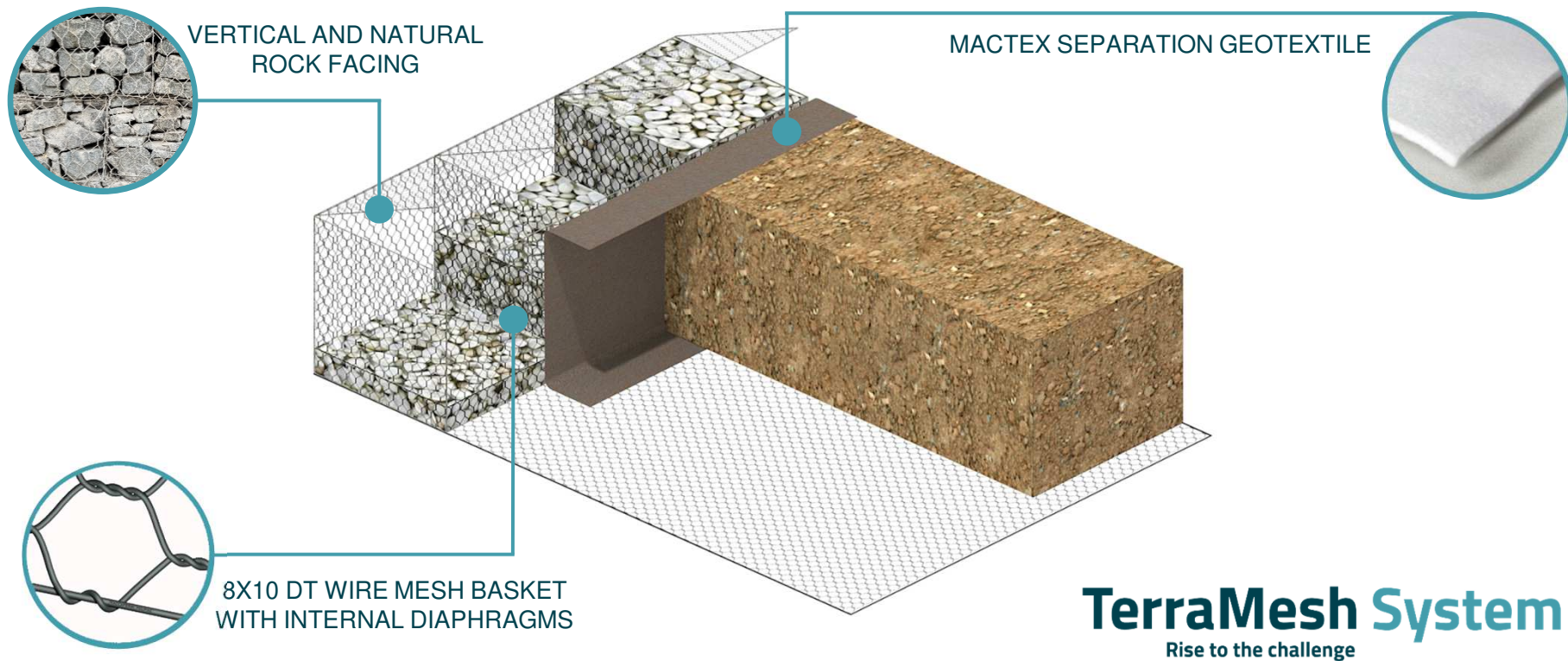
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TerraMesh System
Rise to the challenge

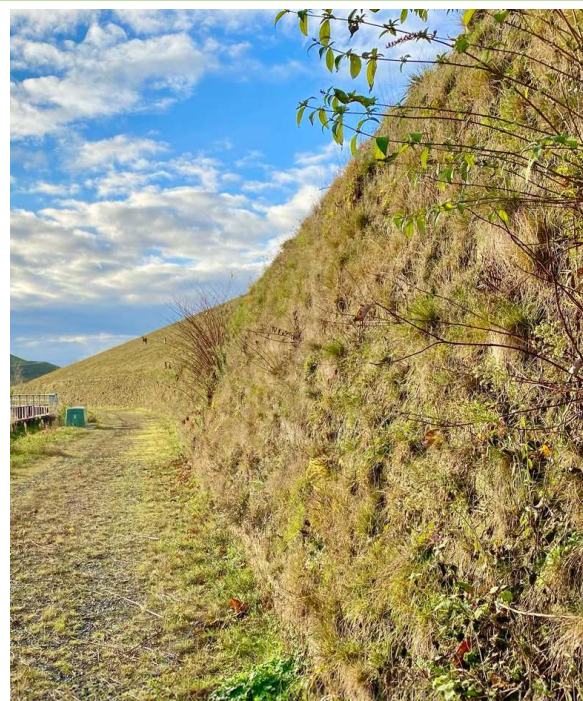
TERRAMESH SYSTEM

MACCAFERRI



THE TERRAMESH FAMILY

MACCAFERRI

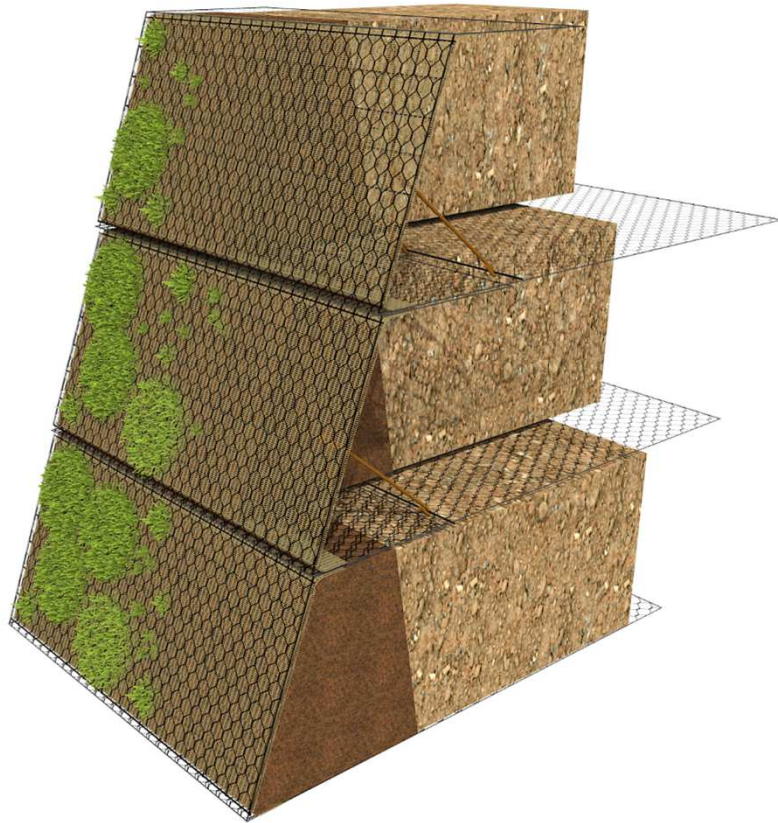


TerraMesh Green
Rise to the challenge

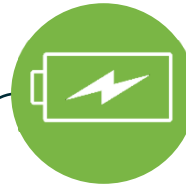


TERRAMESH GREEN

MACCAFERRI



TerraMesh Green is an environmentally friendly modular system used to form green-faced soil reinforced slopes and embankments.



120
YEARS
DESIGN
LIFE



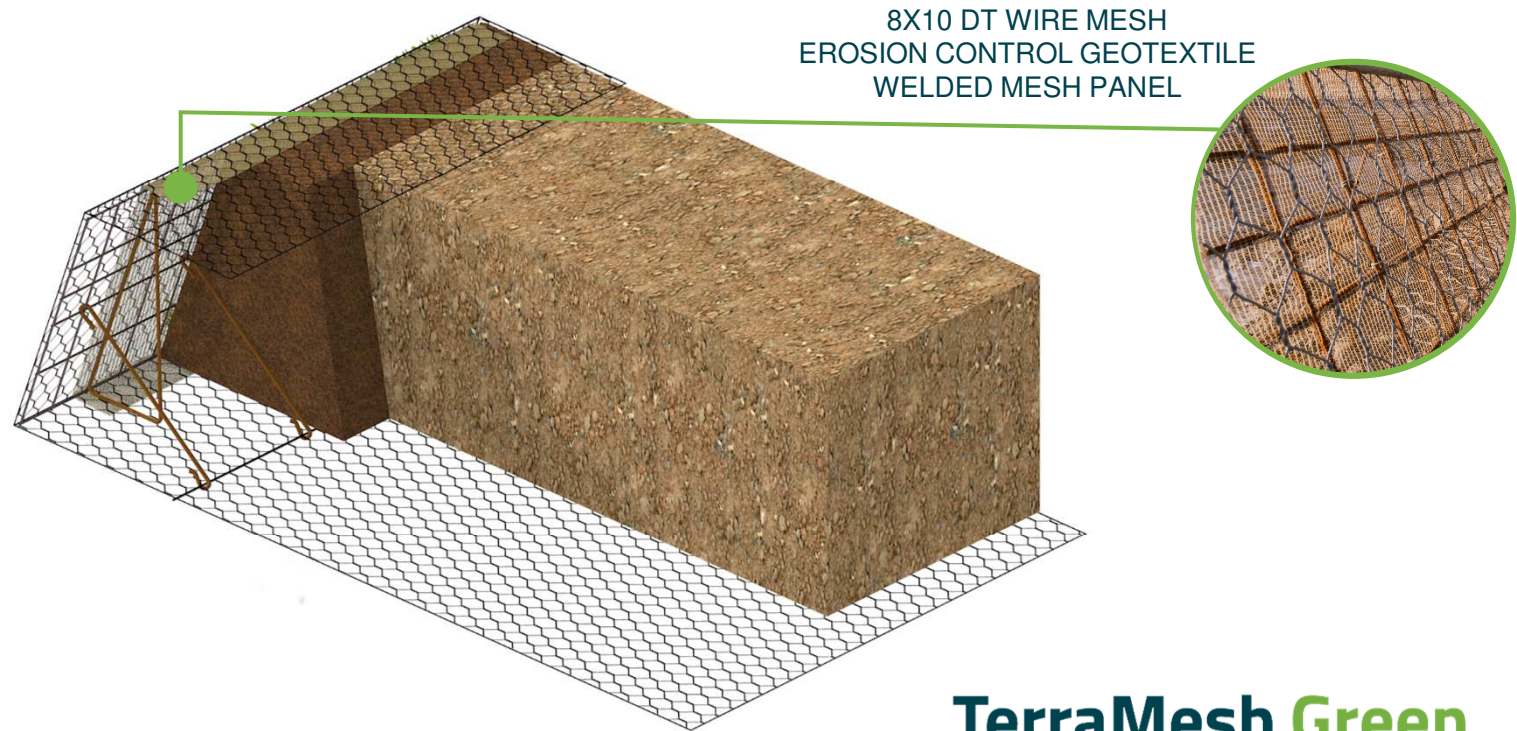
150 m²
INSTALLED
IN A SHIFT



ENHANCED
ECOSYSTEM
DIVERSITY AND
CARBON
SEQUESTRATION

TERRAMESH GREEN

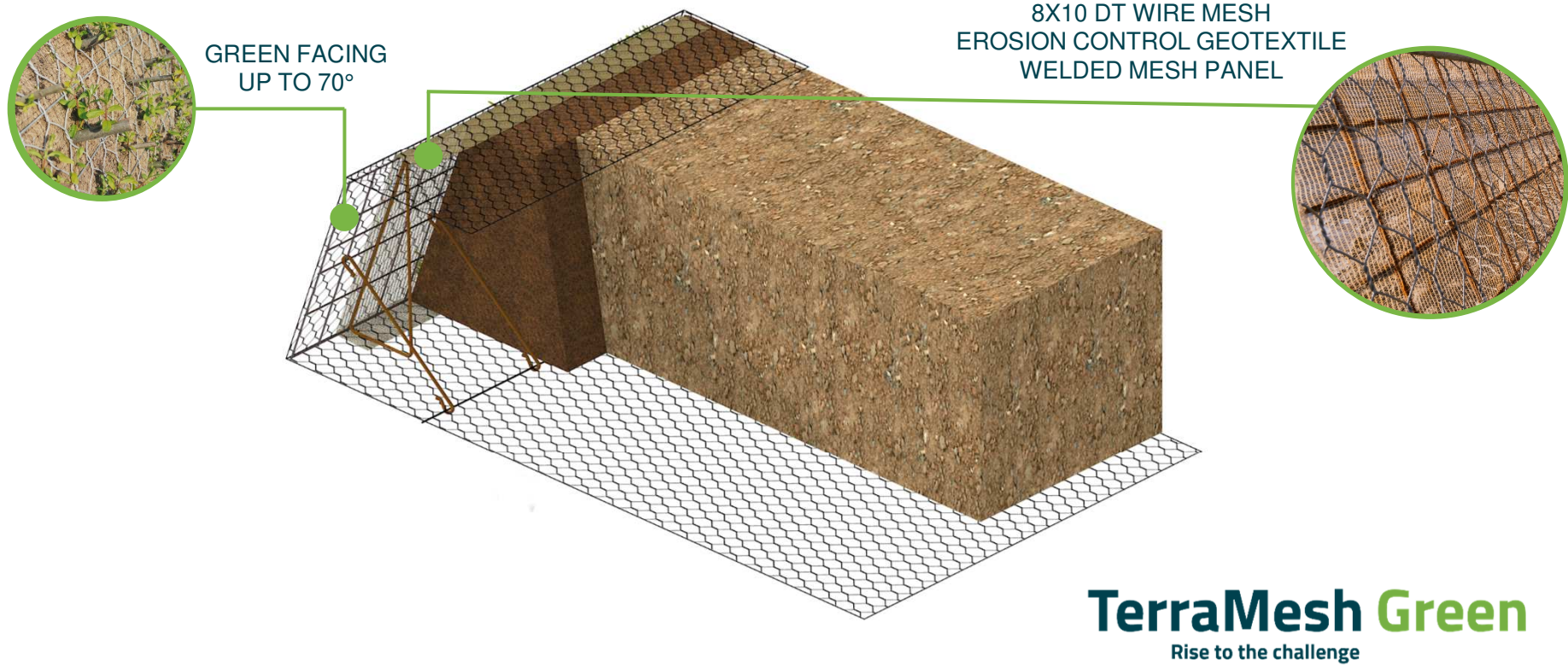
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TerraMesh Green
Rise to the challenge

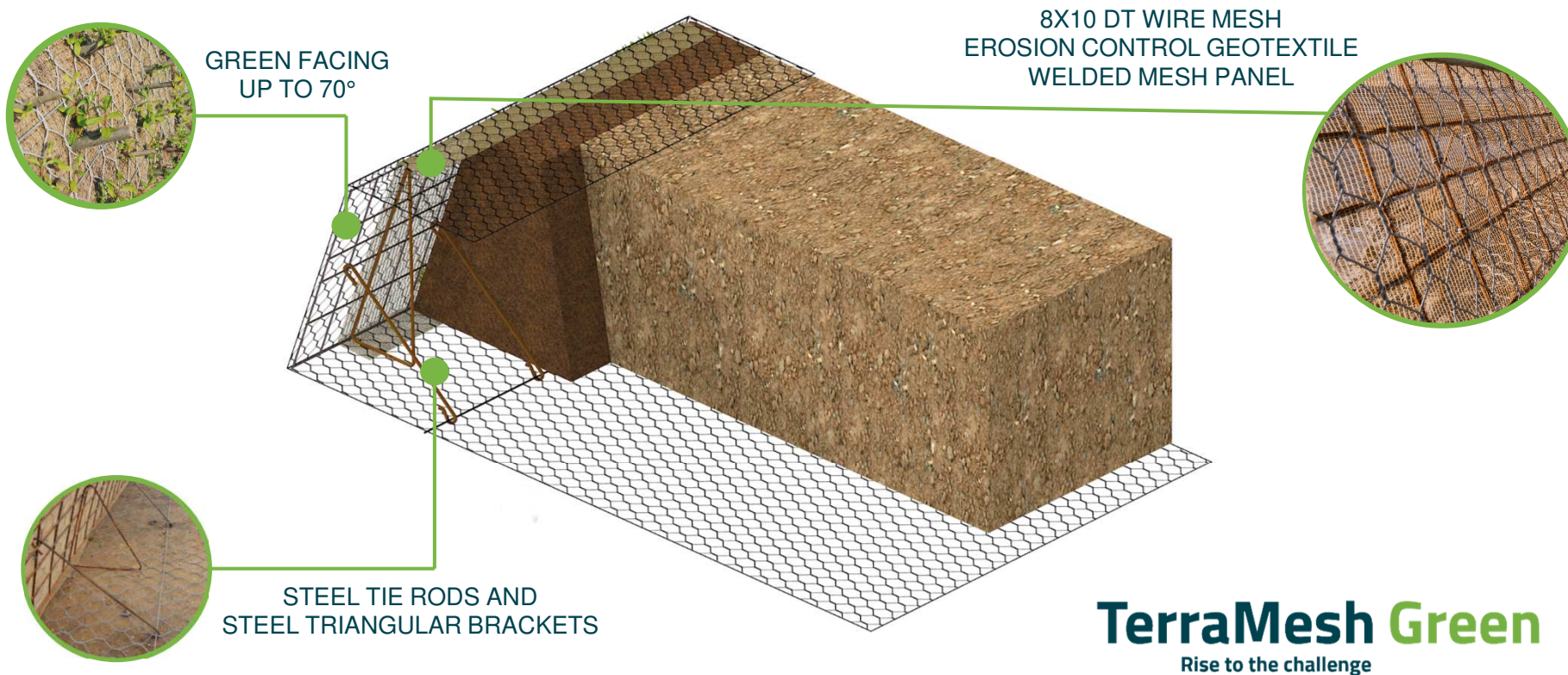
TERRAMESH GREEN

MACCAFERRI



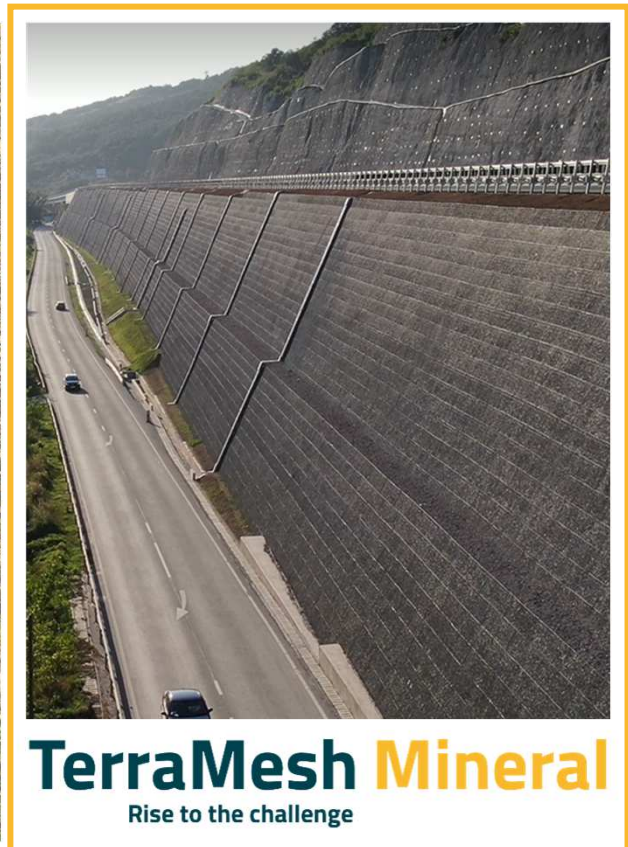
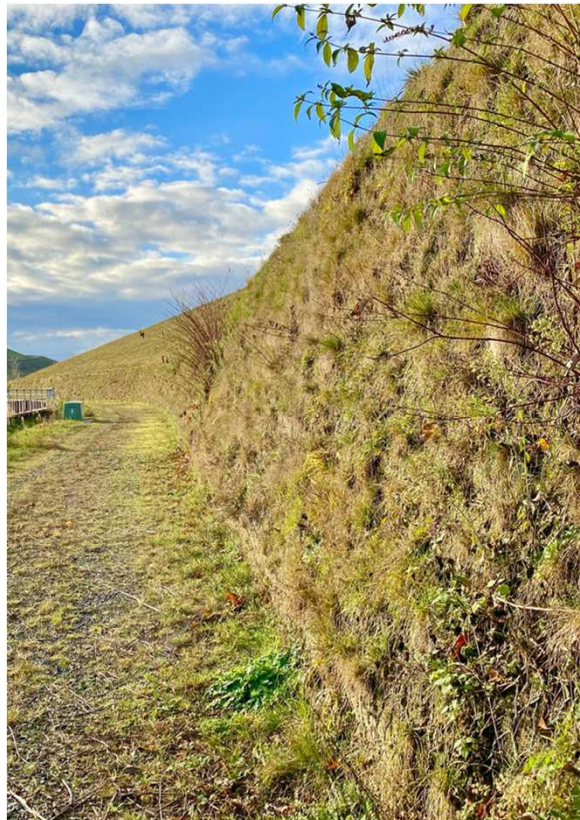
TERRAMESH GREEN

MACCAFERRI



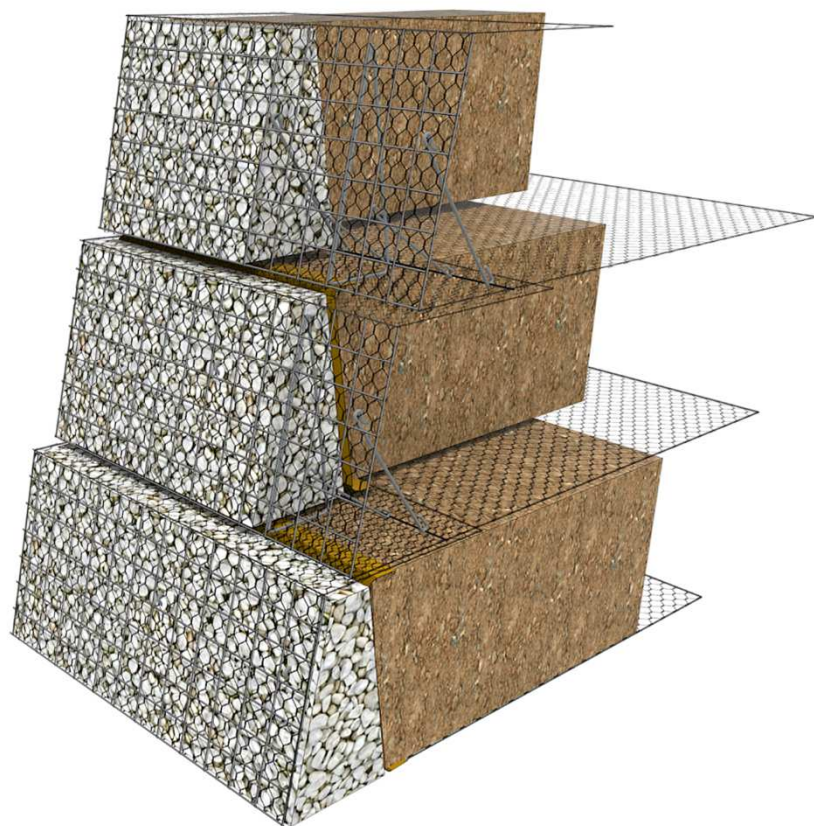
THE TERRAMESH FAMILY

MACCAFERRI

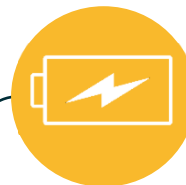


TERRAMESH MINERAL

MACCAFERRI



TerraMesh Mineral is a unique soil reinforcement system with a sloping rock face finish.



120
YEARS
DESIGN
LIFE



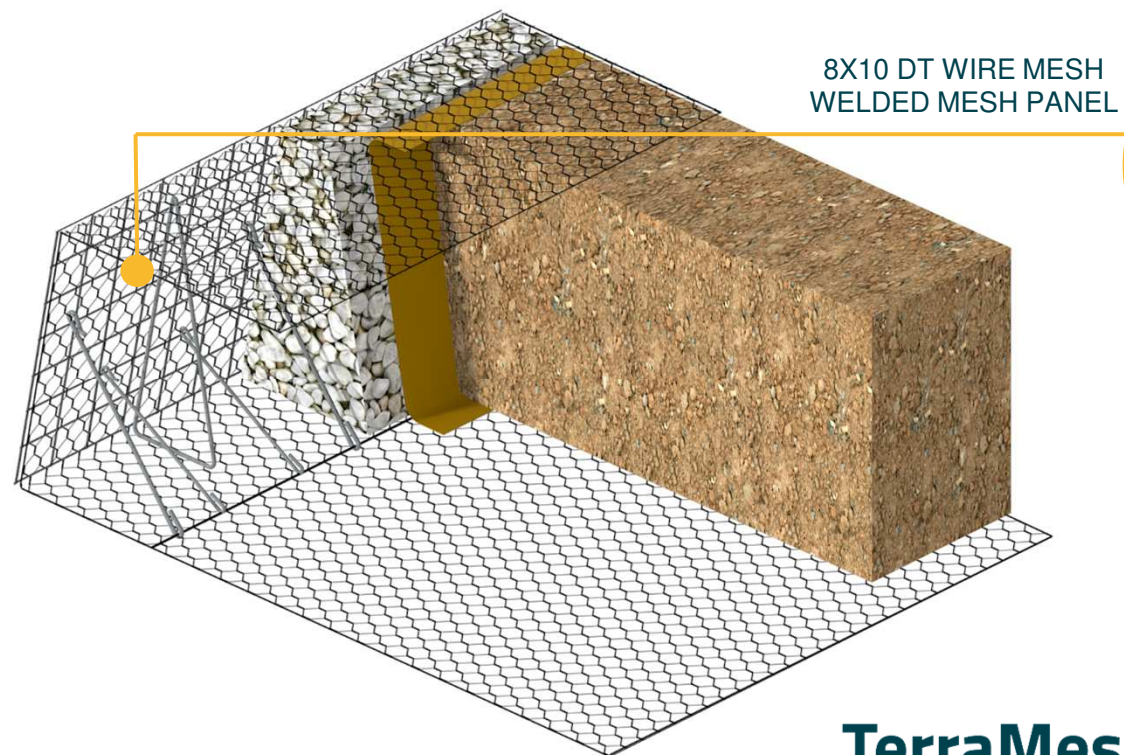
60 m²
INSTALLED
IN A SHIFT



REDUCED
STONE
CONSUMPTION

TERRAMESH MINERAL

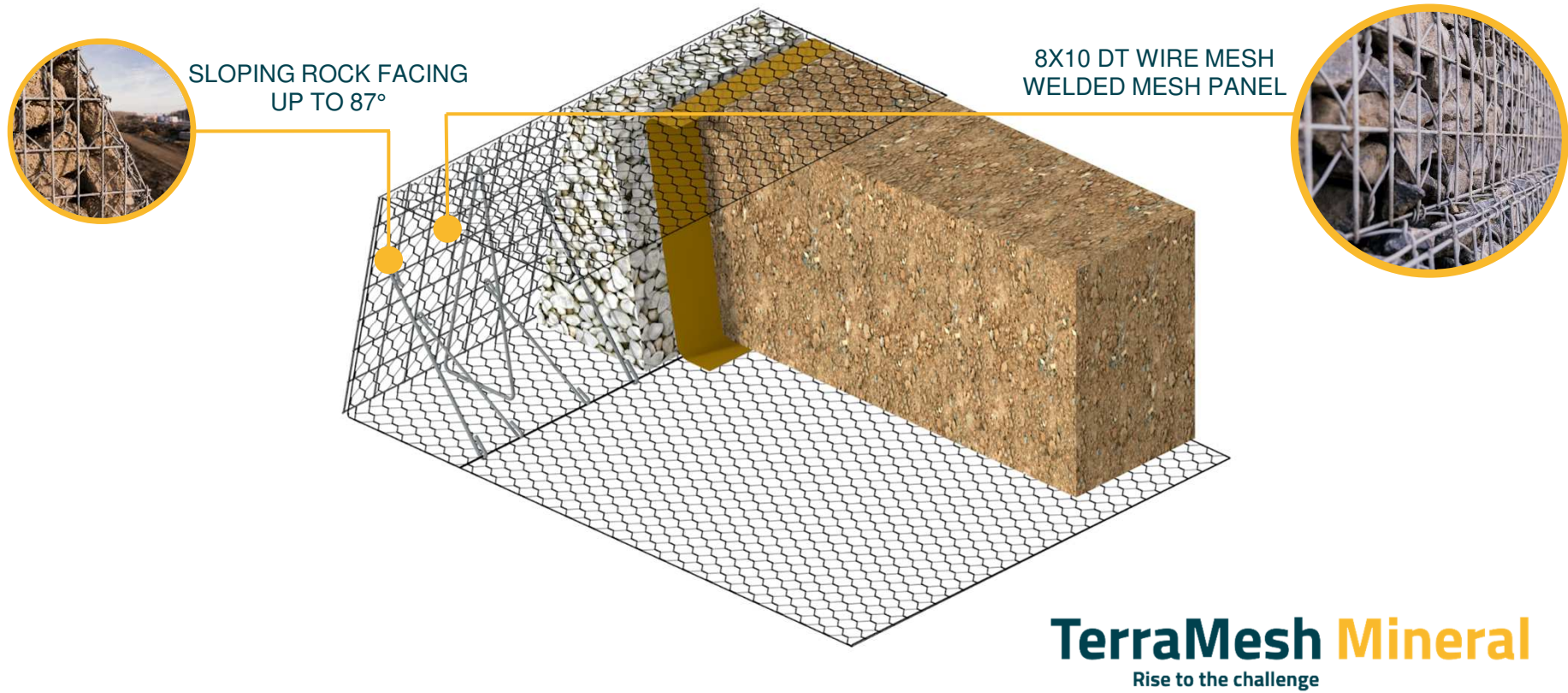
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TerraMesh Mineral
Rise to the challenge

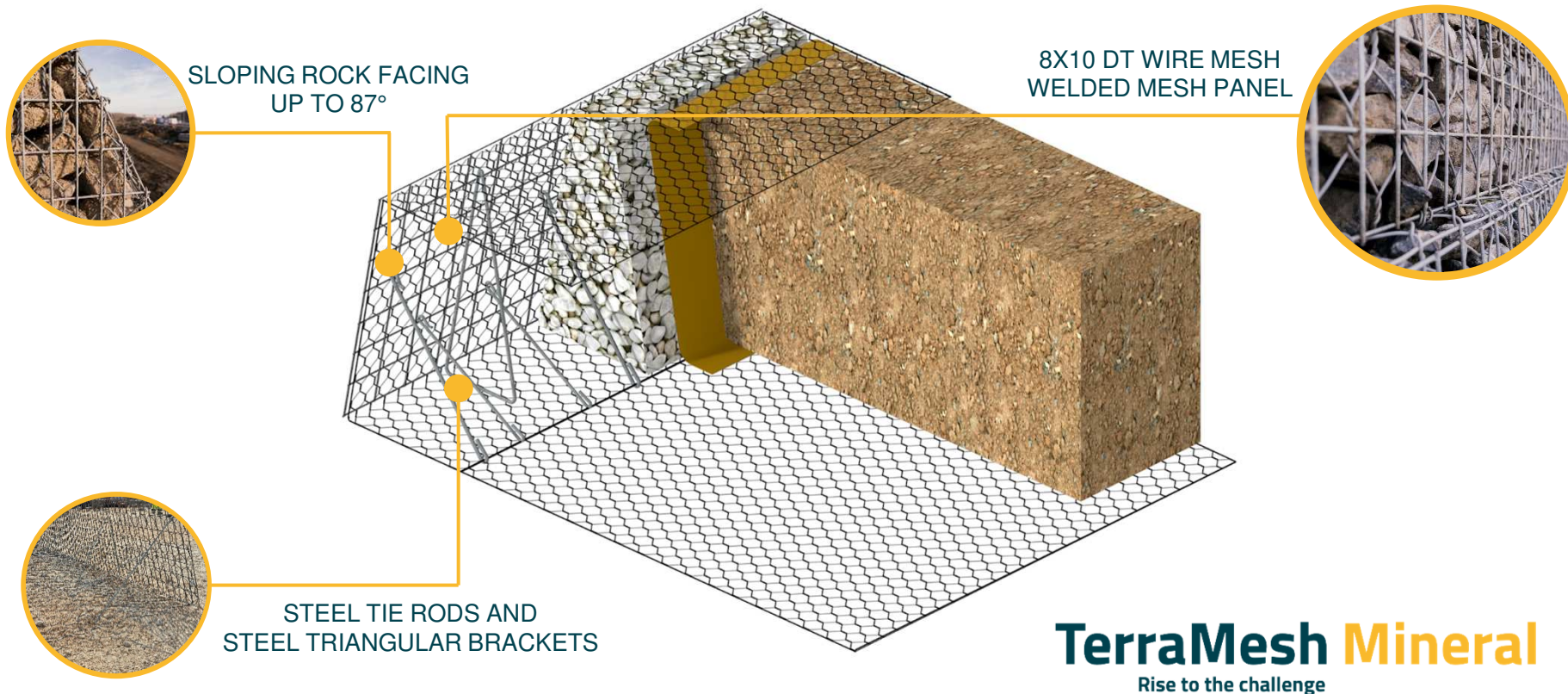
TERRAMESH MINERAL

MACCAFERRI



TERRAMESH MINERAL

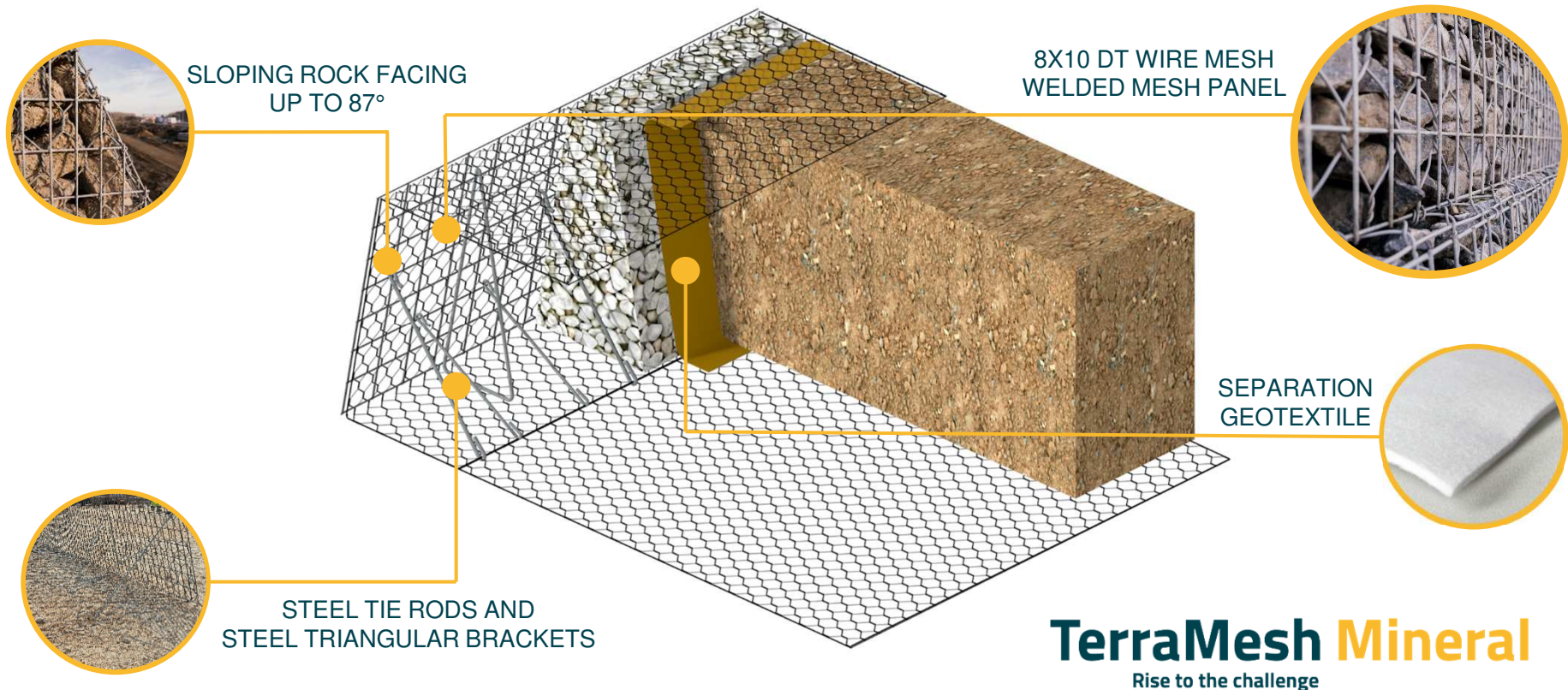
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TerraMesh Mineral
Rise to the challenge

TERRAMESH MINERAL

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PRE-ASSEMBLED UNITS FOR A FAST INSTALLATION

MACCAFERRI



We manufacture the units of TerraMesh solutions as **pre-assembled**, allowing a consistent reduction in the operations to do on-site. Less operations means a **faster installation** and a **better productivity**, but also less inaccuracies and waste of material.

THE CHALLENGE

MACCAFERRI





00:00:00



THE CHALLENGE

MACCAFERRI



THE CHALLENGE

MACCAFERRI



THE CHALLENGE

MACCAFERRI



GEOGRIDS REINFORCEMENT

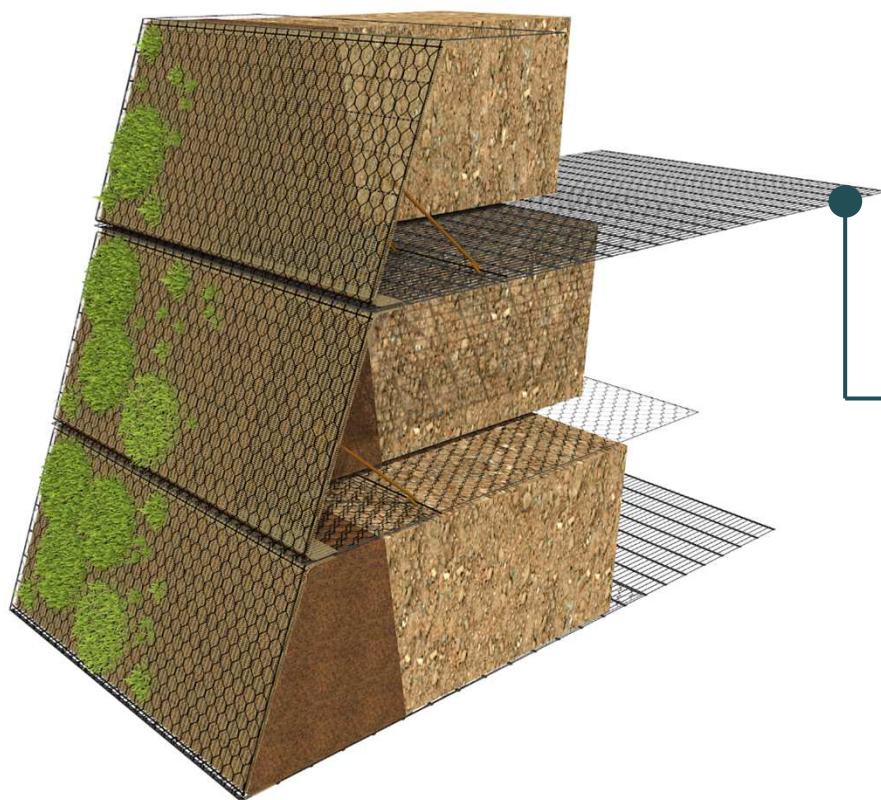
MACCAFERRI



When used in conjunction with our **polymeric geogrids**, the TerraMesh family enables the construction of extremely high and steep structures with an exceptional bearing capacity

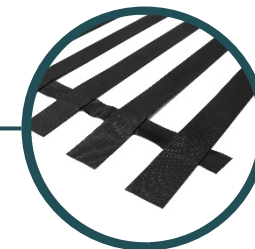
GEOGRIDS REINFORCEMENT

MACCAFERRI



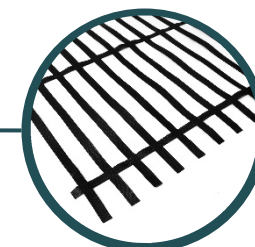
ParaLink

100 kN/m up to 1600 kN/m



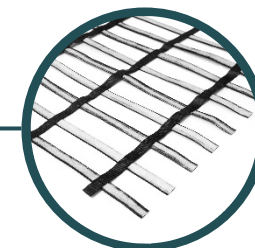
ParaGrid

30 kN/m to 200 kN/m in the longitudinal direction



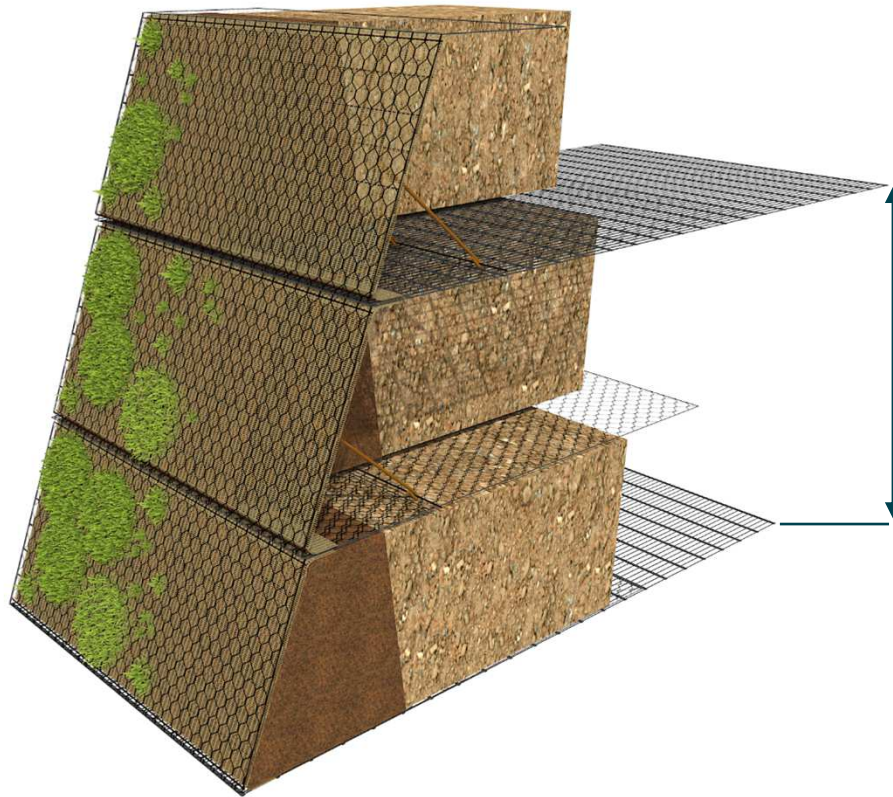
ParaDrain

50 kN/m to 200 kN/m in the longitudinal direction



GEOGRIDS REINFORCEMENT

MACCAFERRI

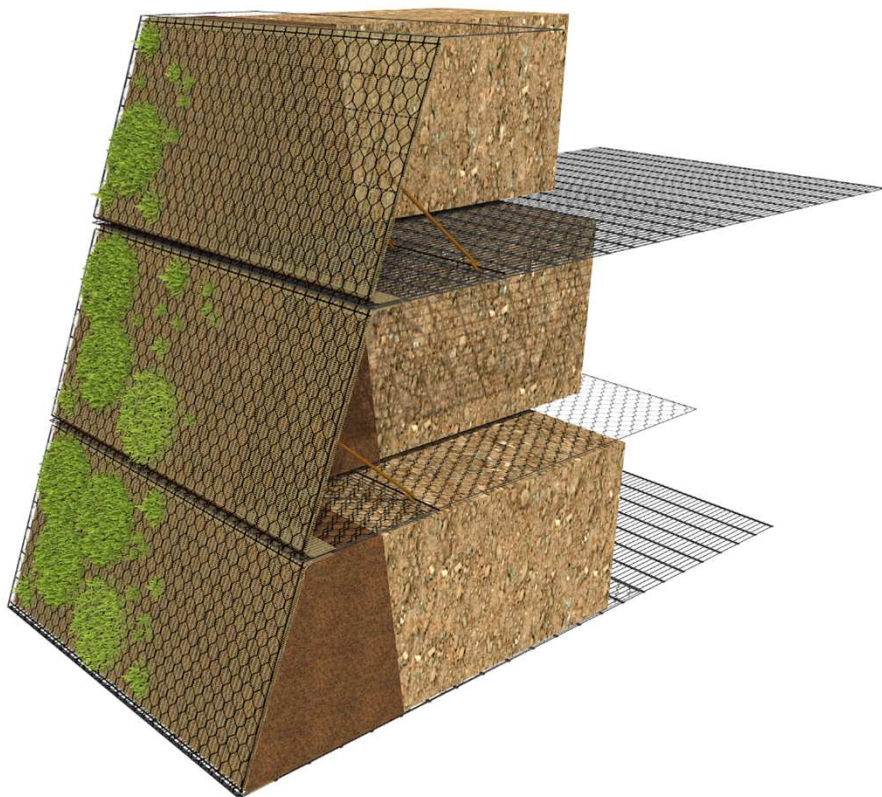


ParaLink, ParaGrid, ParaDrain:
Maccaferri has a wide range of
geogrids with a variety of polymers,
configurations and strengths.

This wide choice allow the
optimization of reinforcement
elements, which can be used only
where necessary, saving materials
and reducing the total cost of the
structure.

GEOGRIDS REINFORCEMENT

MACCAFERRI



The geogrid reinforcement enable soil to accommodate **greater loads**, due to their high tensile strength, low strain and good interaction with the soil.



Paraproducts provide the necessary strength to guarantee the overall stability of the **highest structures** with **steep slopes**.



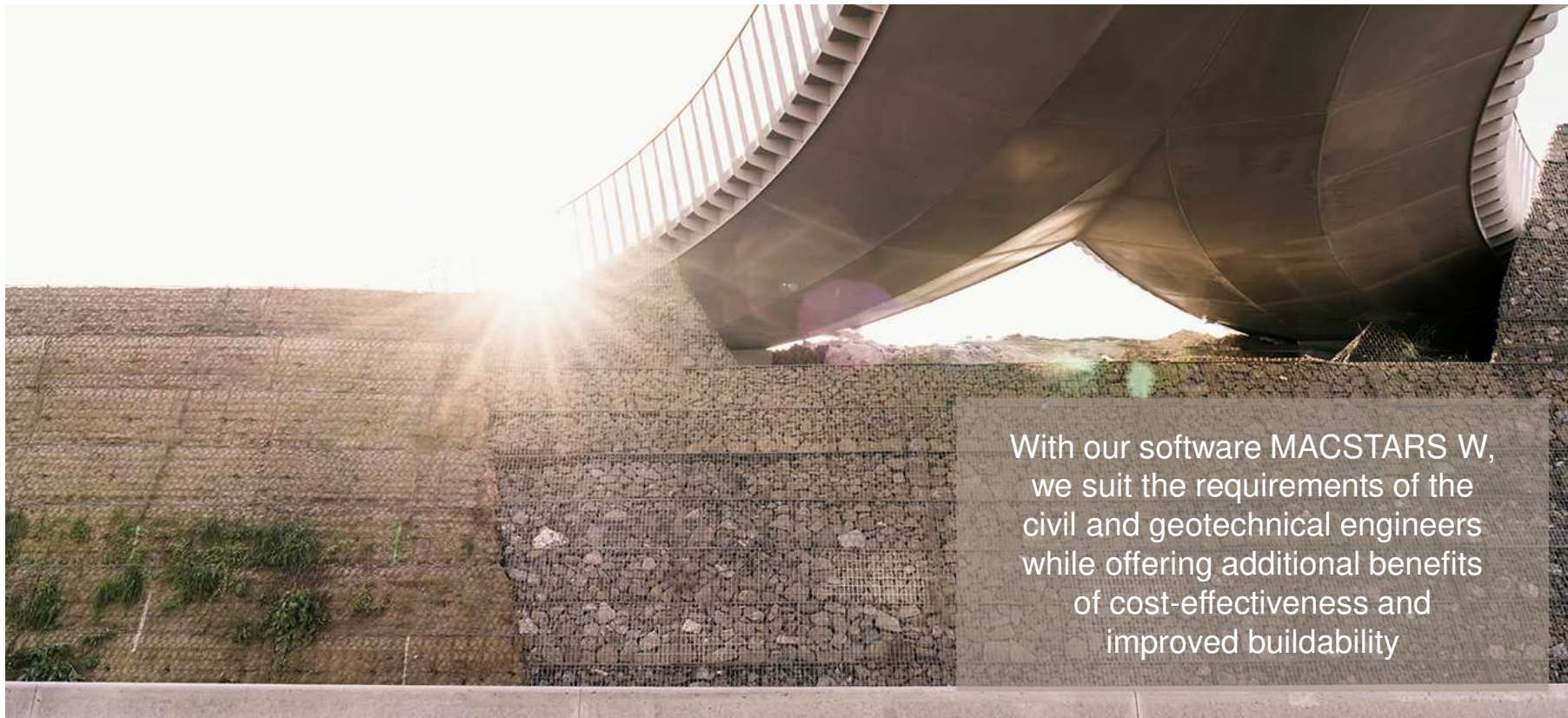
The combined use of Paraproducts with TerraMesh units maximises the **speed of construction**.



Paraproduct reinforcement enables the use of marginal soils making this solution feasible with any **locally available filling**.

DESIGNING HYBRID STRUCTURES

MACCAFERRI



With our software MACSTARS W,
we suit the requirements of the
civil and geotechnical engineers
while offering additional benefits
of cost-effectiveness and
improved buildability

MACSTARS W

MACCAFERRI

The software that suits the requirements of civil and geotechnical engineers

MacSTARS enables the design of high-end and challenging structures in the most diverse conditions



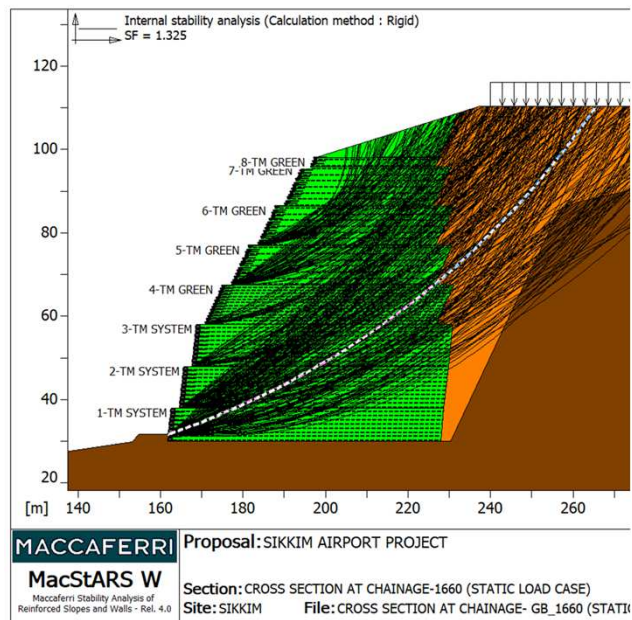
Would you like to download the software?
Type "**SOFTWARE**" in the chat box!



FROM MACSTARS W TO INSTALLED PROJECT

MACCAFERRI

Sikkim Airport Project, India



10,000+
projects designed per year



LONG-TERM BENEFITS

MACCAFERRI

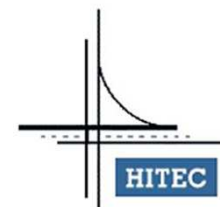


CERTIFIED QUALITY

MACCAFERRI

Why choosing a TerraMesh solution?

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

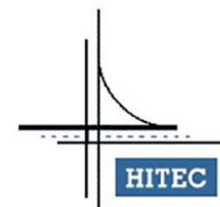


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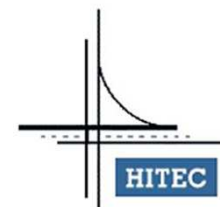
Approval on the product quality including testing in laboratories, onsite evaluations, quality management checks and inspections of production

CERTIFIED QUALITY

MACCAFERRI

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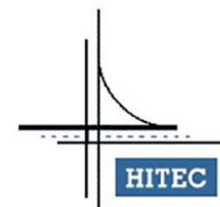
Transparent and comparable
information about the life-cycle
environmental impact of products

CERTIFIED QUALITY

MACCAFERRI

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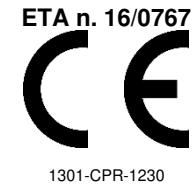
Continuous control
of product
performance in
compliance with EU
legislation

CERTIFIED QUALITY

MACCAFERRI

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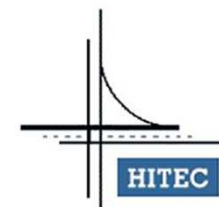
Highway Innovative
Technology Evaluation
Center – an evaluation
performed by a panel of
experts - final report is
the result of an
impartial, consensus-
based approach to
evaluating the system

CERTIFIED QUALITY

MACCAFERRI

Why choosing a TerraMesh solution?

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



Rigorous certification procedure to ensure that the performances of commercial kits conform to predefined performances criteria

ENVIRONMENTAL SUSTAINABILITY

All our efforts are aimed at delivering the most environmentally sustainable solutions

MACCAFERRI



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

The TerraMesh family has a low environmental impact (GWP 1,04 kgCO₂eq)



OUR BEST PROJECTS AROUND THE WORLD

MACCAFERRI

In its

140 years of experience

Maccaferri has carried out thousands of projects around the world.



OUR BEST PROJECTS AROUND THE WORLD

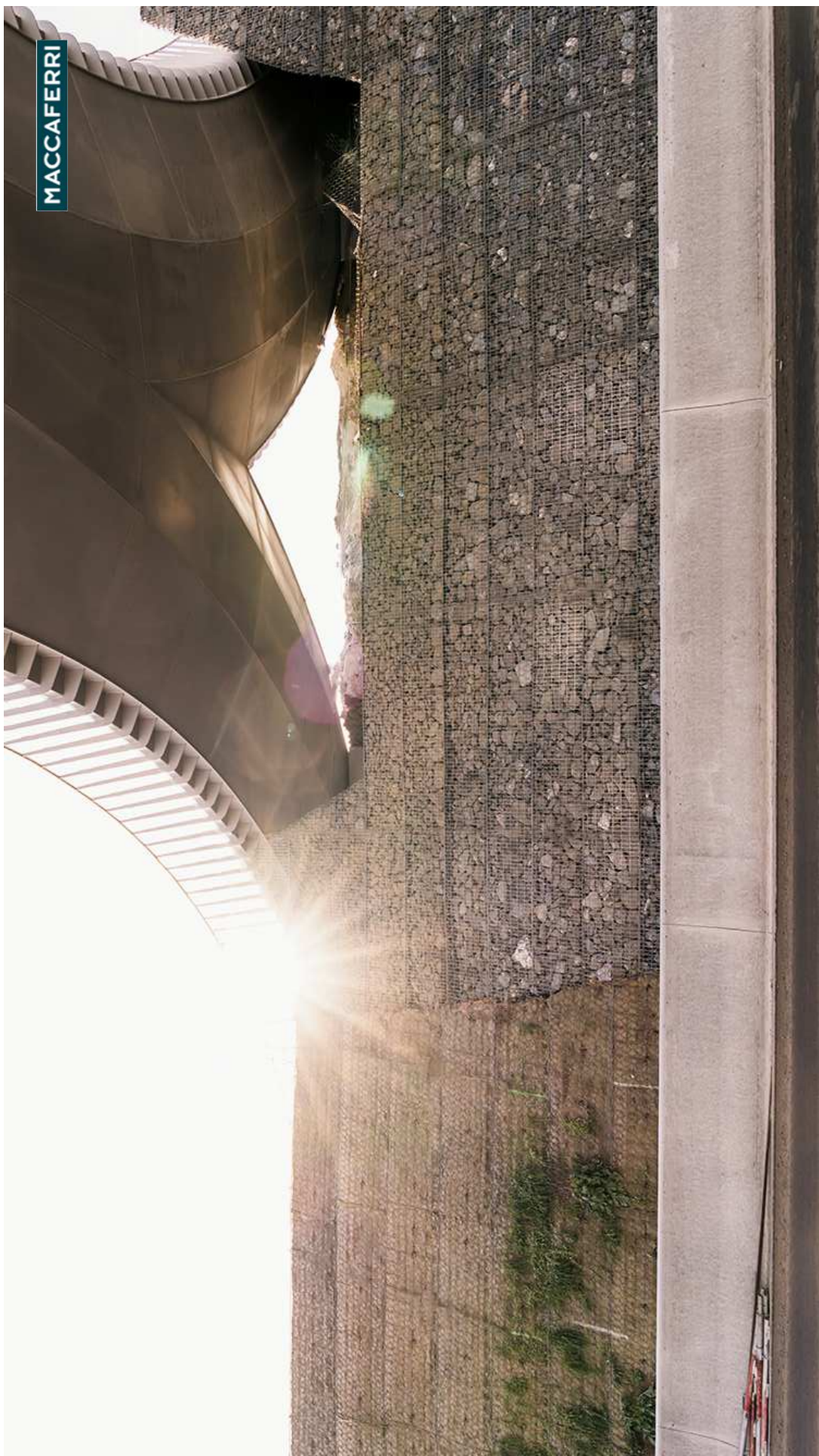
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ANTWERP'S OOSTERWEEL LINK Antwerp, Belgium



MACCAFERRI



ANTWERP'S OOSTERWEEL LINK

Our contribution towards a sustainable mobility

Client: LANTIS / TEXION GEOSYNTHETICS NV

Designer: ARCADIS NV / LANTIS

Contractor: STADSBADER NV

Products used (Qty.): TERRAMESH™ (SYSTEM, GREEN AND MINERAL) 20,000 + pcs - PARALINK™ 100,000 m2 - PARAGRIDS™ 120,000 m2

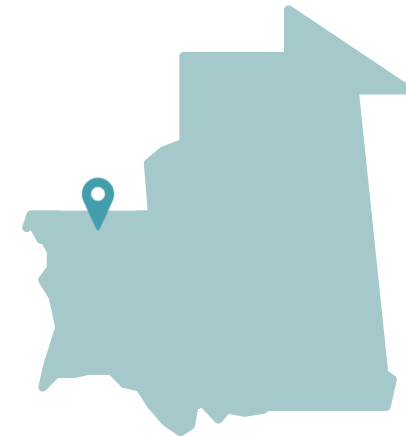
Date of construction: 04/2018 - ONGOING

OUR BEST PROJECTS AROUND THE WORLD

MACCAFERRI



ADRAR MASSIF TASIAST GOLD MINE
Tasiast, Mauritania





MACCAFERRI

ADRAR MASSIF TASIAST GOLD MINE

One of the highest TerraMesh™ wall system in the field of Mining applications

Client: KINROSS

Designer: AUSENCO

Contractor: TASIAST MAURITANIE LTD SA

Products used (Qty.): TERRAMESH™ 2,200 m² -
PARALINK™ 45,000 m²

Date of construction: 09/2017 - 03/2018

OUR BEST PROJECTS AROUND THE WORLD

MACCAFERRI



MUSEUM OF THE FUTURE Dubai, United Arab Emirates





MACCAFERRI

MUSEUM OF THE FUTURE

A green contribution to a piece of art

MACCAFERRI

Client: MERAAS

Designer: BURO HAPPOLD ENGINEERING

Contractor: BAM INTERNATIONAL

Products used (Qty.): TERRAMESH™ GREEN 3,500 m2 -
MACWEB 3,000 m2 - MACDRAIN™ W 12,500 m2 - MACMAT HS 6,000
m2 BIOMAC™ NATURAL 9,000 m2 - DT MESH HS 3,000 m2

Date of construction: 11/2018 - 04/2021

OUR BEST PROJECTS AROUND THE WORLD

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MACCAFERRI SOLUTIONS FOR CONSTRUCTION OF NEW AIRPORT AT PAKYONG, SIKKIM Pakyong, Sikkim, India



MACCAFERRI

Aerial view of Pakyong Airport/Source: Airport Authority of India
(AAI) - VDR



MACCAFERRI SOLUTIONS FOR CONSTRUCTION OF NEW AIRPORT AT PAKYONG, SIKKIM

The 2012 international ground engineering project of the year

Client: AIRPORTS AUTHORITY OF INDIA (AAI)

Designer: PUNJJ LLOYD LTD AND MACCAFERRI

Contractor: MOTT MCDONALD INDIA PVT LTD

Date of construction: 2009 - 2018

OUR BEST PROJECTS AROUND THE WORLD

MACCAFERRI



**HUBEI SHENNONGJIA AIRPORT
TERRAMESH™ RETAINING WALL PROJECT**
ShenNongJia, Hubei, China



MACCAFERRI



HUBEI SHENNONGJIA AIRPORT TERRAMESH™ RETAINING WALL PROJECT

A fast access to the world's ecological treasure house

Client: BEIJING JINGGANG AIRPORT CONSTRUCTION CO. LTD.

Designer: CIVIL AVIATION NEW ERA AIRPORT DESIGN
INSTITUTE GUANGZHOU BRANCH

Contractor: BEIJING CHINA AVIATION PORT CONSTRUCTION
ENGINEERING CO., LTD.

Products used (Qty.): TERRAMESH™ SYSTEM 19,127 pcs

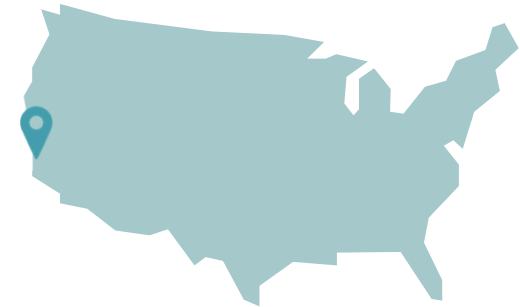
Date of construction: 07/2011 - 09/2012

OUR BEST PROJECTS AROUND THE WORLD

MACCAFERRI



**BAY BRIDGE, CALIFORNIA, 112-FOOT-TALL
VEGETATED RSS**
Bridge, California, U.S.A.



MACCAFERRI



BAY BRIDGE, CALIFORNIA, 112-FOOT-TALL VEGETATED RSS

Our contribution to the Bay Bridge reconstruction

Client: MERAAS

Designer: BURO HAPPOLD ENGINEERING

Contractor: BAM INTERNATIONAL

Products used (Qty.): TERRAMESH™ GREEN 3,500 m2 -
MACWEB 3,000 m2 - MACDRAIN™ W 12,500 m2 - MACMAT HS 6,000
m2 BIOMAC™ NATURAL 9,000 m2 - DT MESH HS 3,000 m2

Date of construction: 11/2018 - 04/2021

OUR BEST PROJECTS AROUND THE WORLD

MACCAFERRI



PERILAGO PATH
Pcia. - Mendoza, Potrerillos, Argentina



MACCAFERRI



PERILAGO PATH

Our contribution to the reconstruction of route 82

MACCAFERRI

Client: DIRECCIÓN PROVINCIAL DE VIALIDAD DE MENDOZA

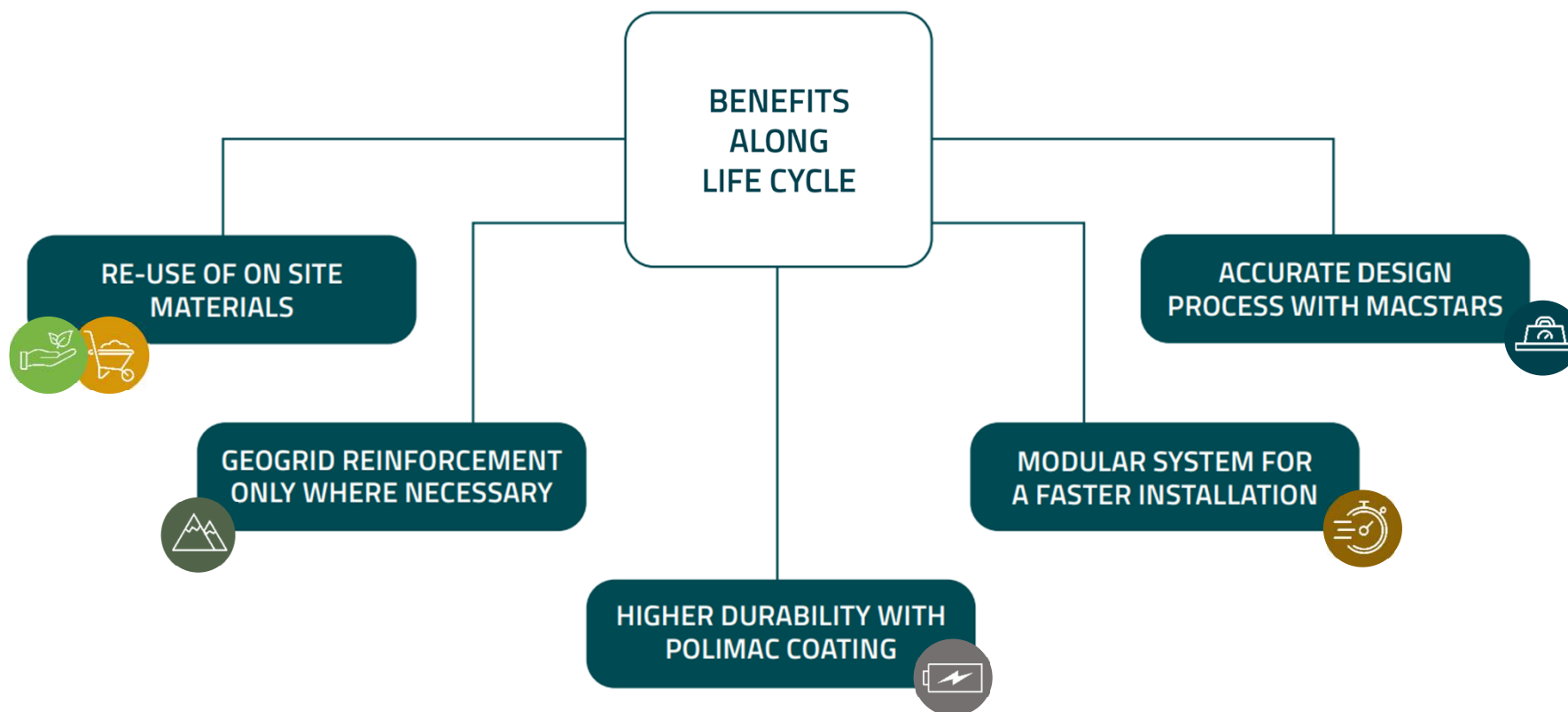
Contractor: UTE HOMAQ - ROVELLA - PAEDILLE

Products used (Qty.): TERRAMESH™ 3,965 m² - GABION™ 94,5 m³ - RENO MATRESS 2,190 m²

Date of construction: 02/2002 - 07/2003

WHY IS TERRAMESH THE BEST?

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DESIGN THE CHANGE



*United Arab Emirates,
32-m high Terramesh System Wall*



TerraMesh Q&A

Rise to the challenge

Any questions? Type them in the chat box!



Thank you!

**We look forward to seeing you
at our next webinar!**