



# PRE-ASSEMBLED EARTH RETAINING SYSTEMS: THE TERRAMESH FAMILY

Date  
Author

May 11, 2023  
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*

MACCAFERRI

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

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### 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

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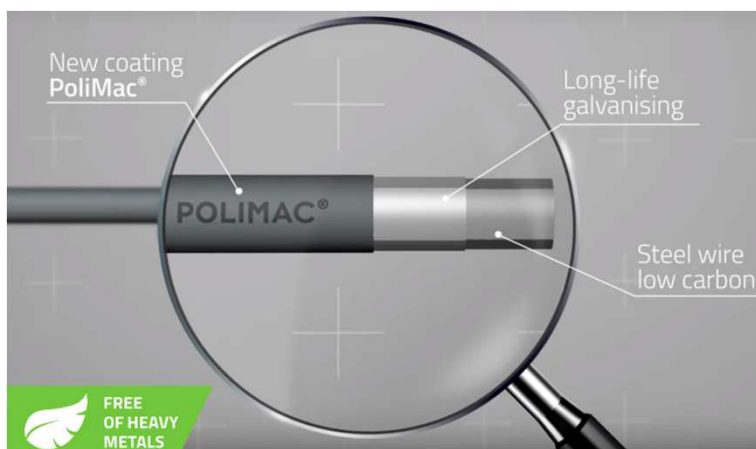
## Why is TerraMesh the best?



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.



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?



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.

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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.

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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!

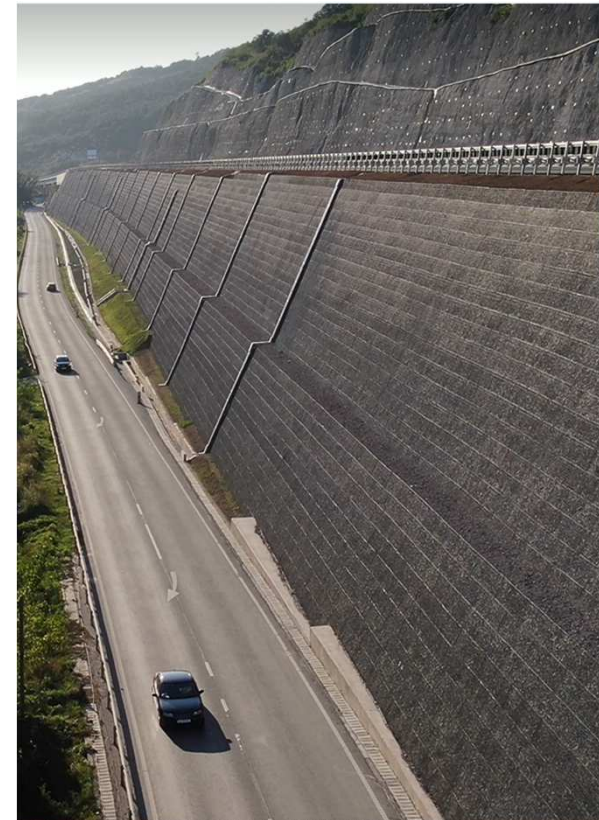
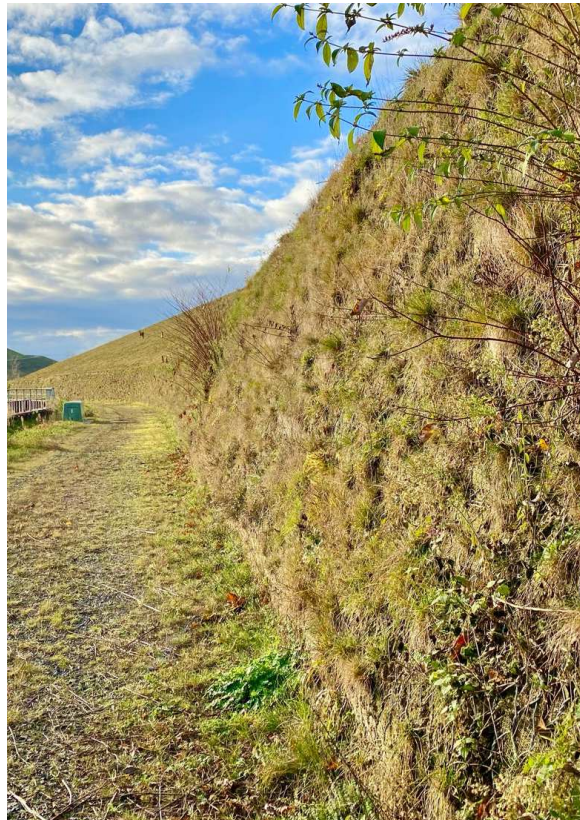
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## THE TERRAMESH FAMILY

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## THE TERRAMESH FAMILY

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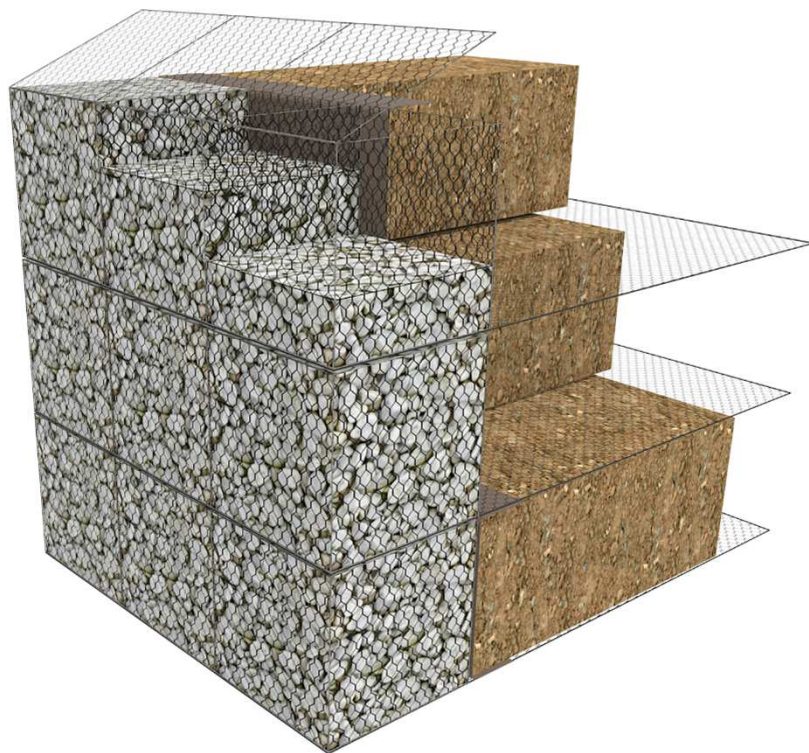


**TerraMesh System**  
Rise to the challenge

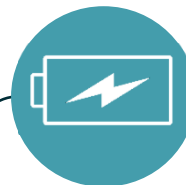


## TERRAMESH SYSTEM

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** m<sup>2</sup>  
INSTALLED  
IN A SHIFT

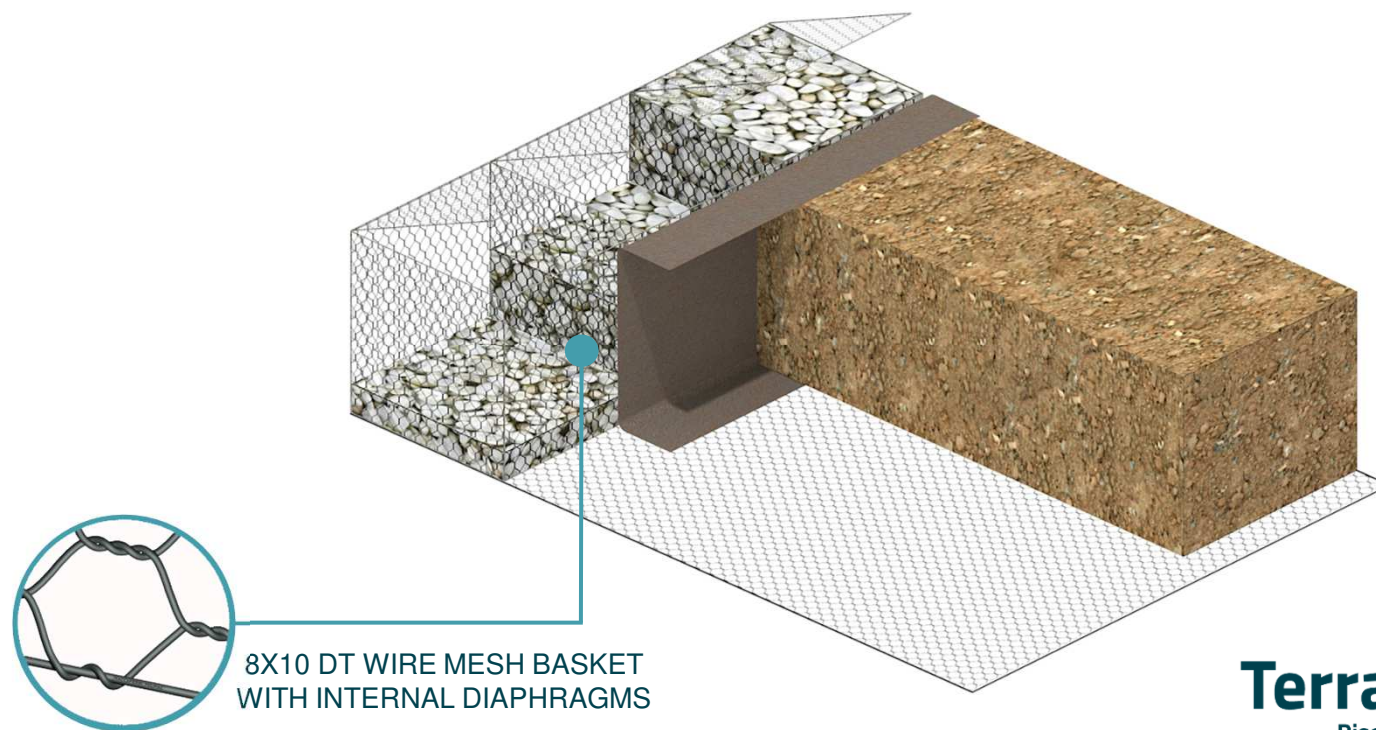


GREAT  
PERFORMANCE  
UNDER HIGH  
LOADS

# TERRAMESH SYSTEM

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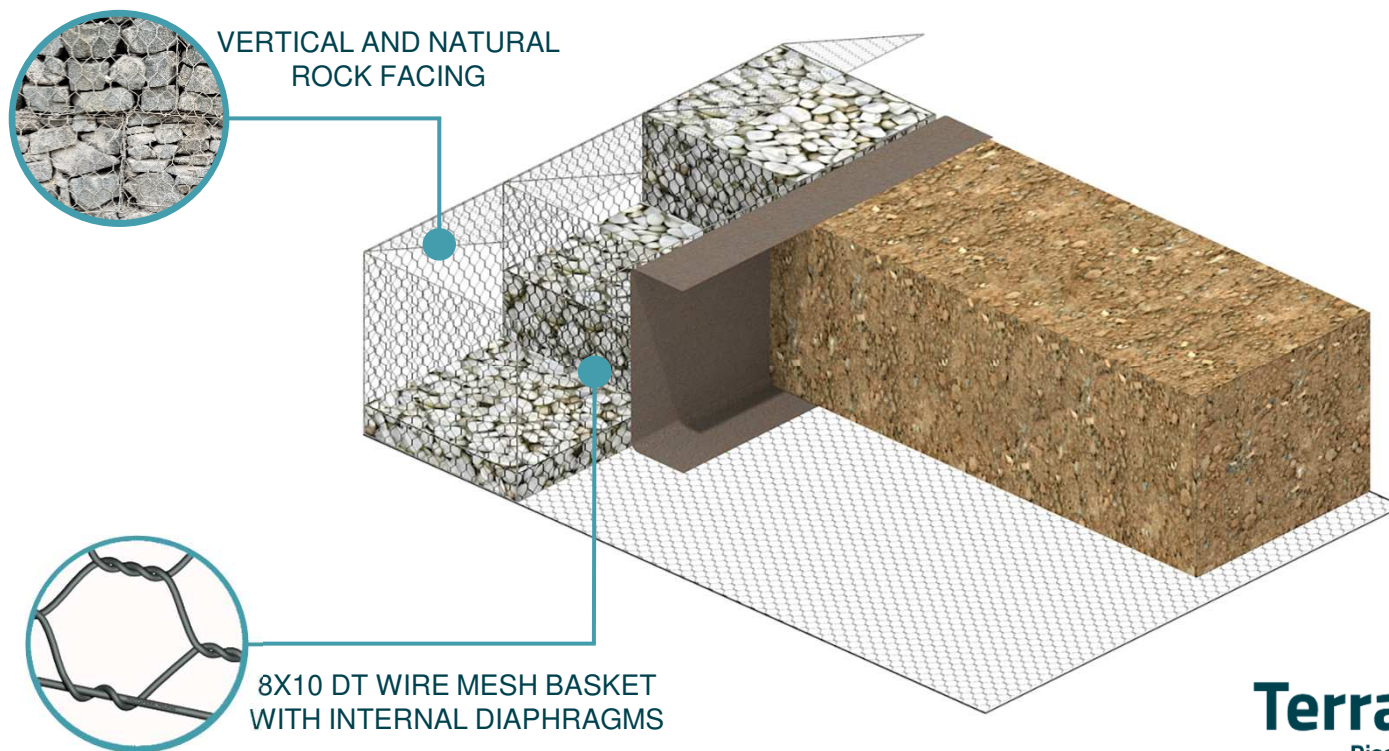
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**TerraMesh System**  
Rise to the challenge

# TERRAMESH SYSTEM

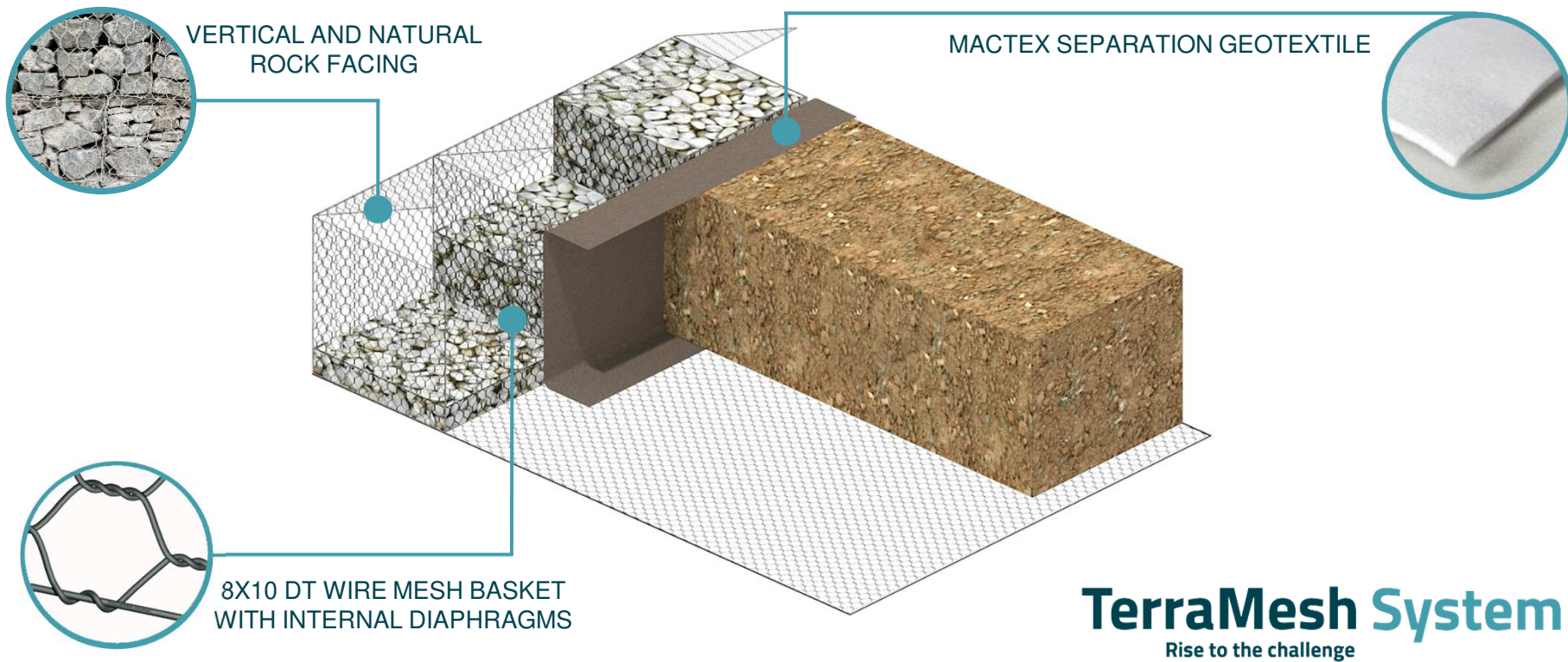
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**TerraMesh System**  
Rise to the challenge

# TERRAMESH SYSTEM

MACCAFERRI



## THE TERRAMESH FAMILY

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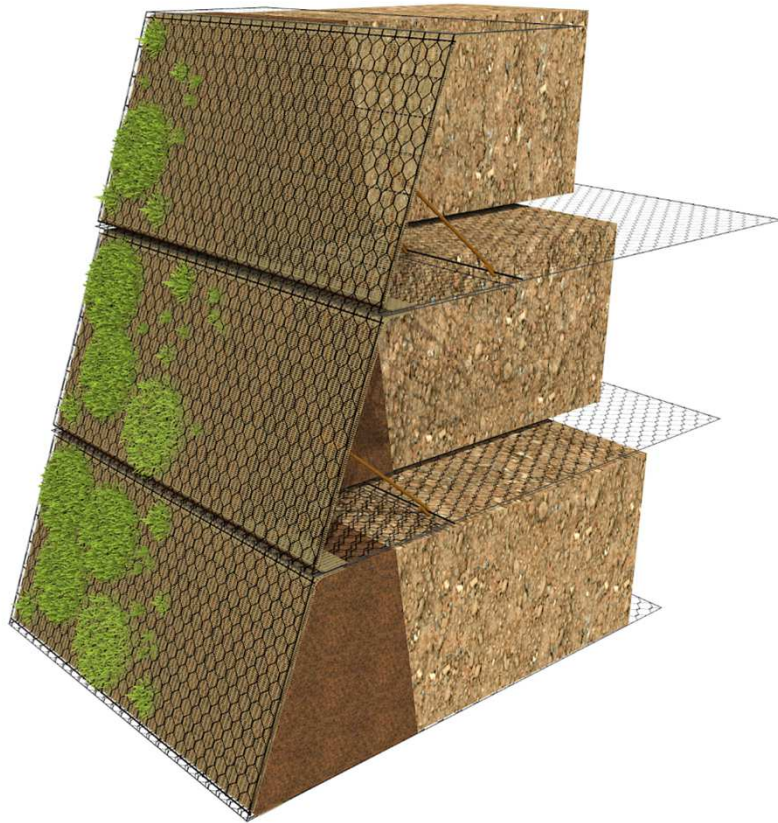


**TerraMesh Green**  
Rise to the challenge

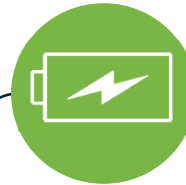


## TERRAMESH GREEN

MACCAFERRI



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



**120**  
YEARS  
DESIGN  
LIFE



**150** m<sup>2</sup>  
INSTALLED  
IN A SHIFT

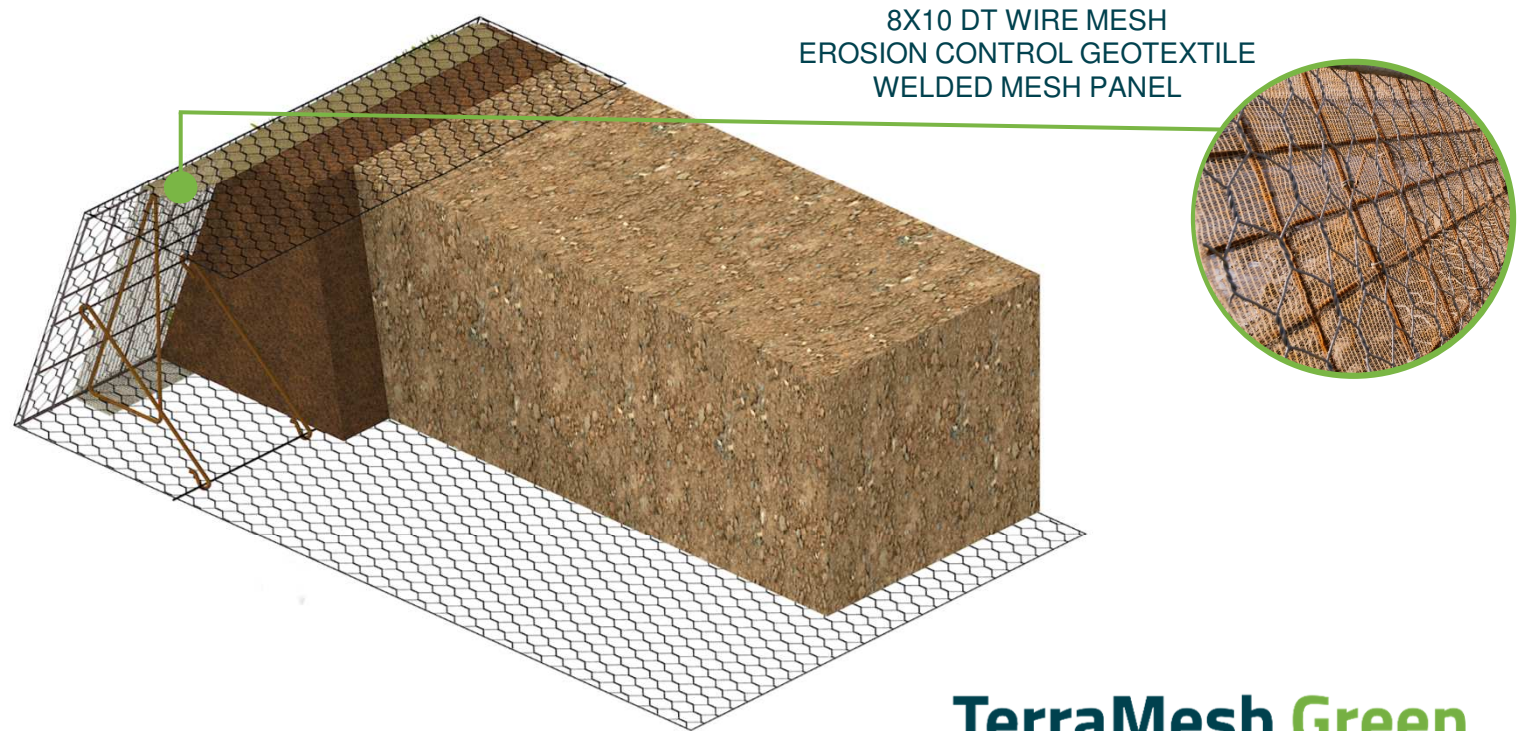


ENHANCED  
ECOSYSTEM  
DIVERSITY AND  
CARBON  
SEQUESTRATION

# TERRAMESH GREEN

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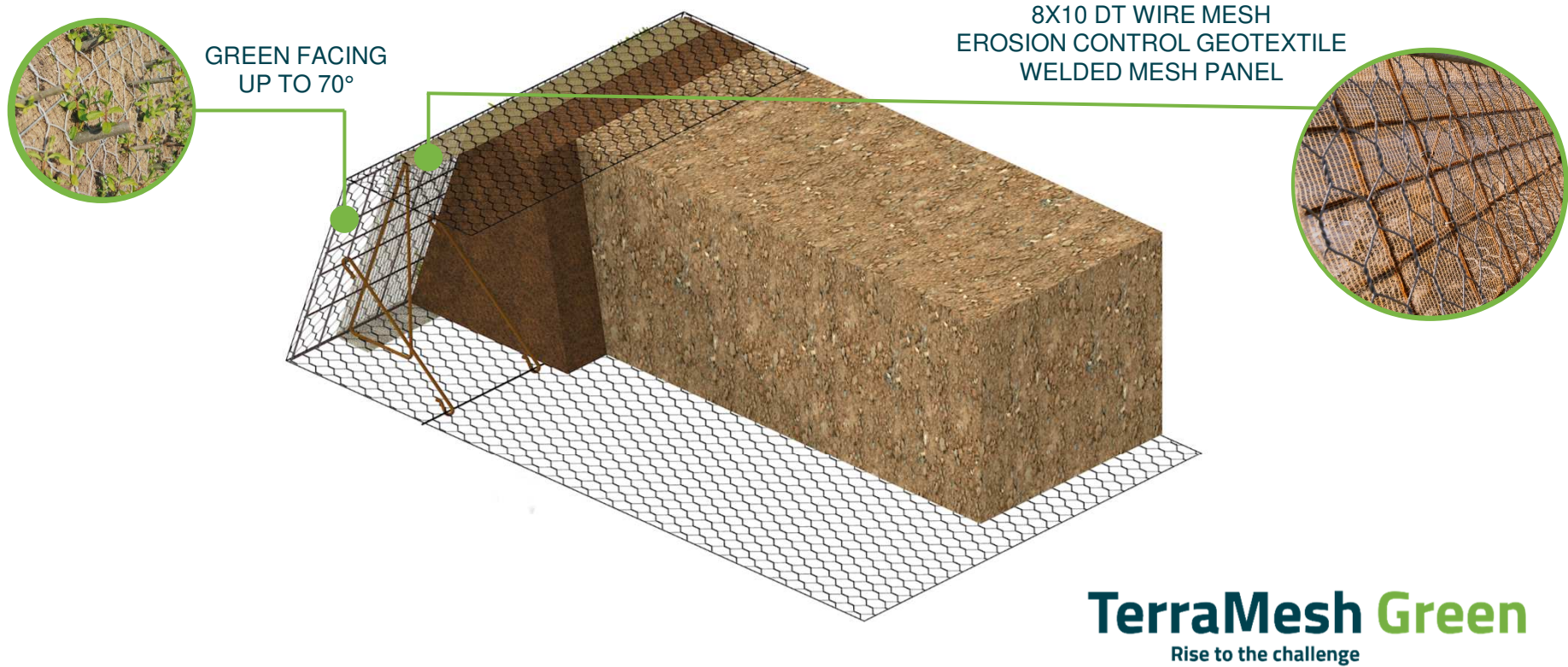
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**TerraMesh Green**  
Rise to the challenge

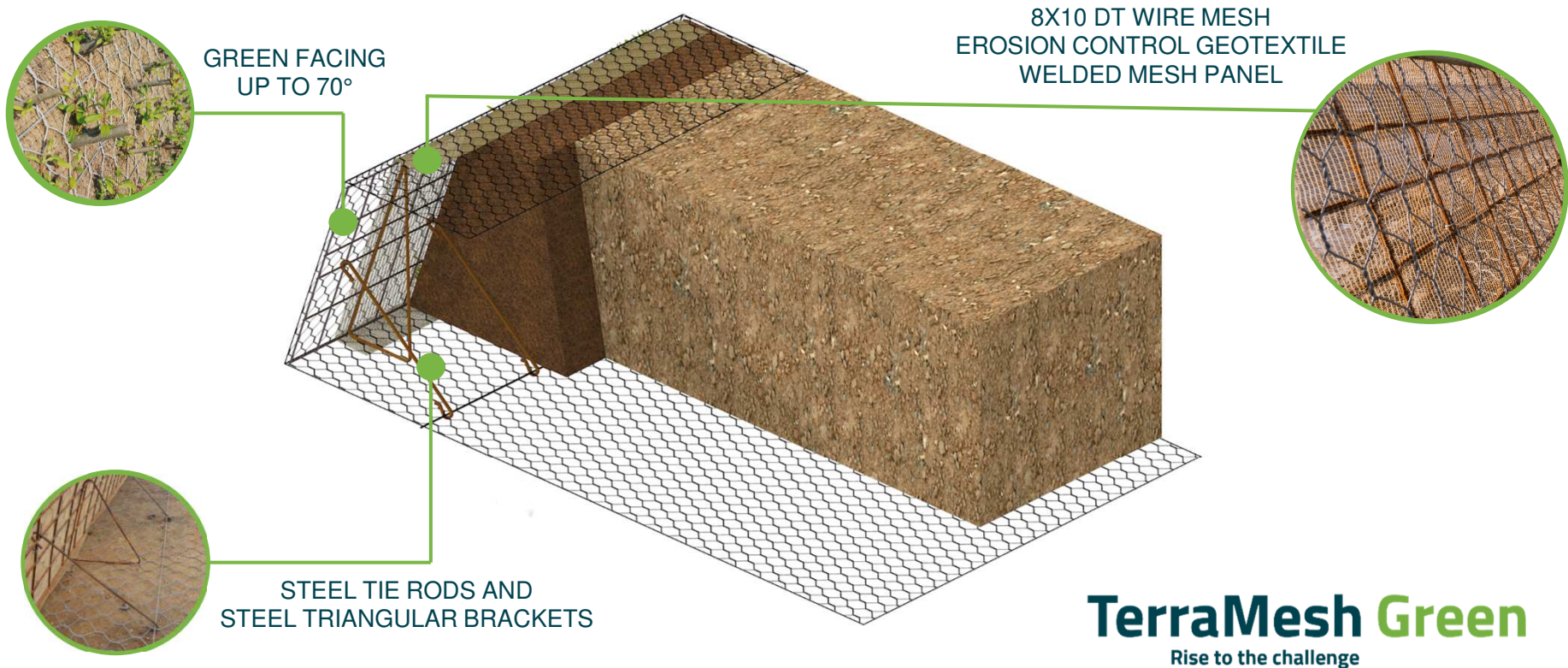
# TERRAMESH GREEN

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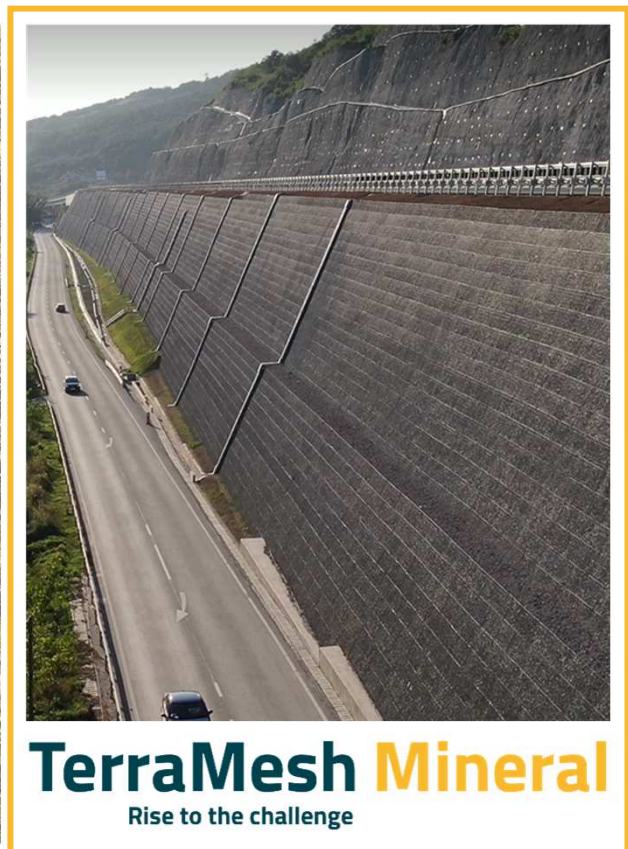
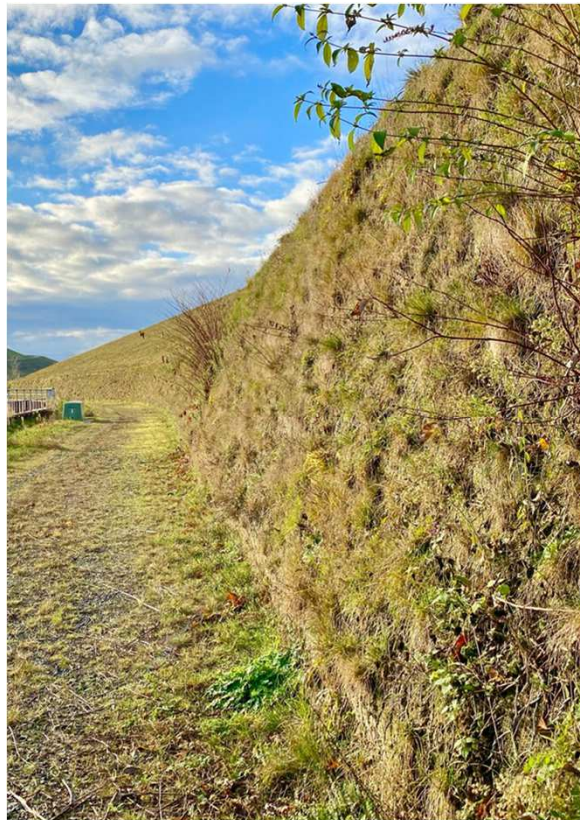
# TERRAMESH GREEN

MACCAFERRI



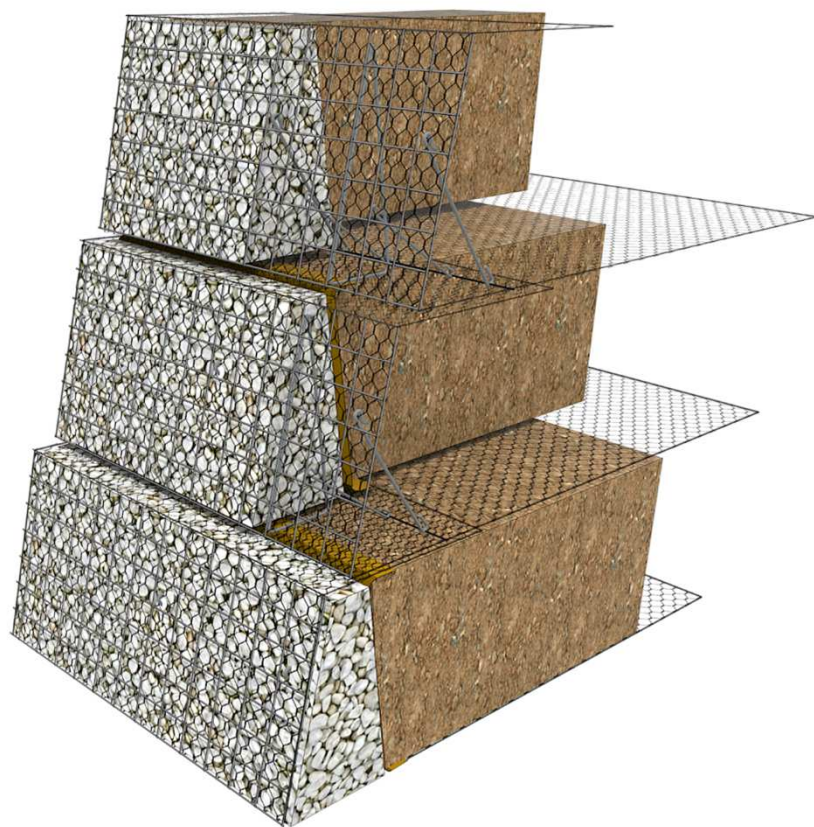
## THE TERRAMESH FAMILY

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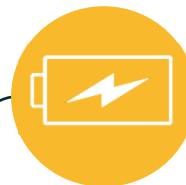


## TERRAMESH MINERAL

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



**120**  
YEARS  
DESIGN  
LIFE



**60** m<sup>2</sup>  
INSTALLED  
IN A SHIFT

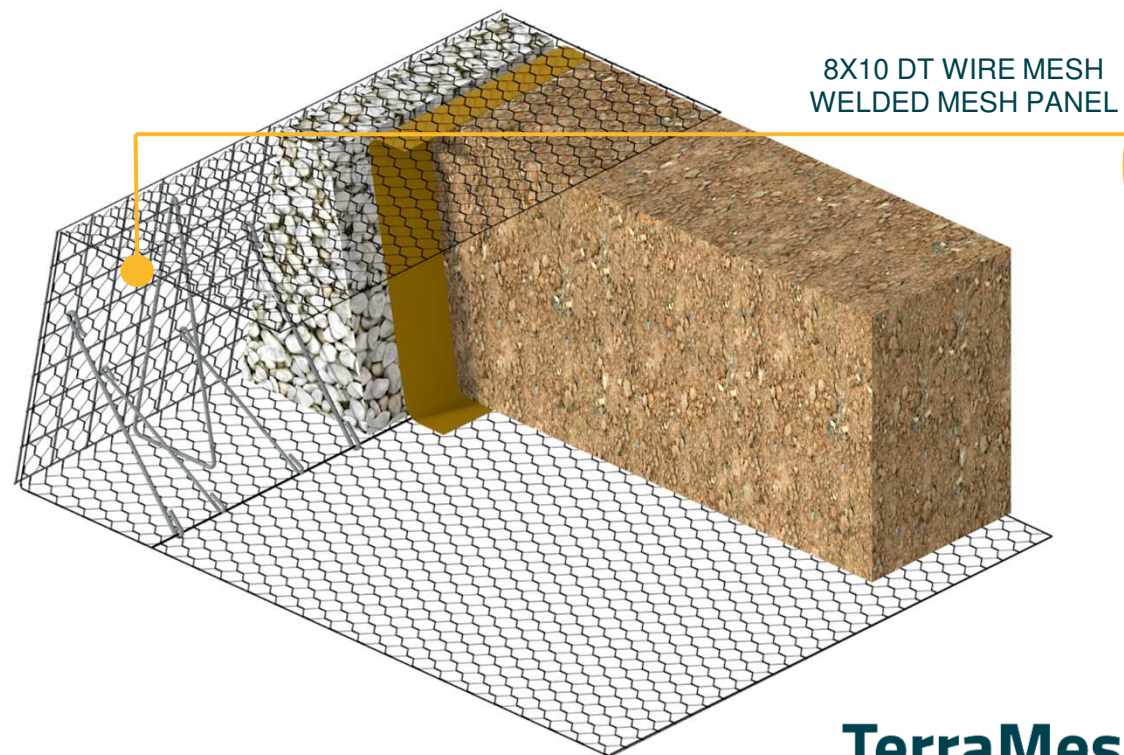


REDUCED  
STONE  
CONSUMPTION

# TERRAMESH MINERAL

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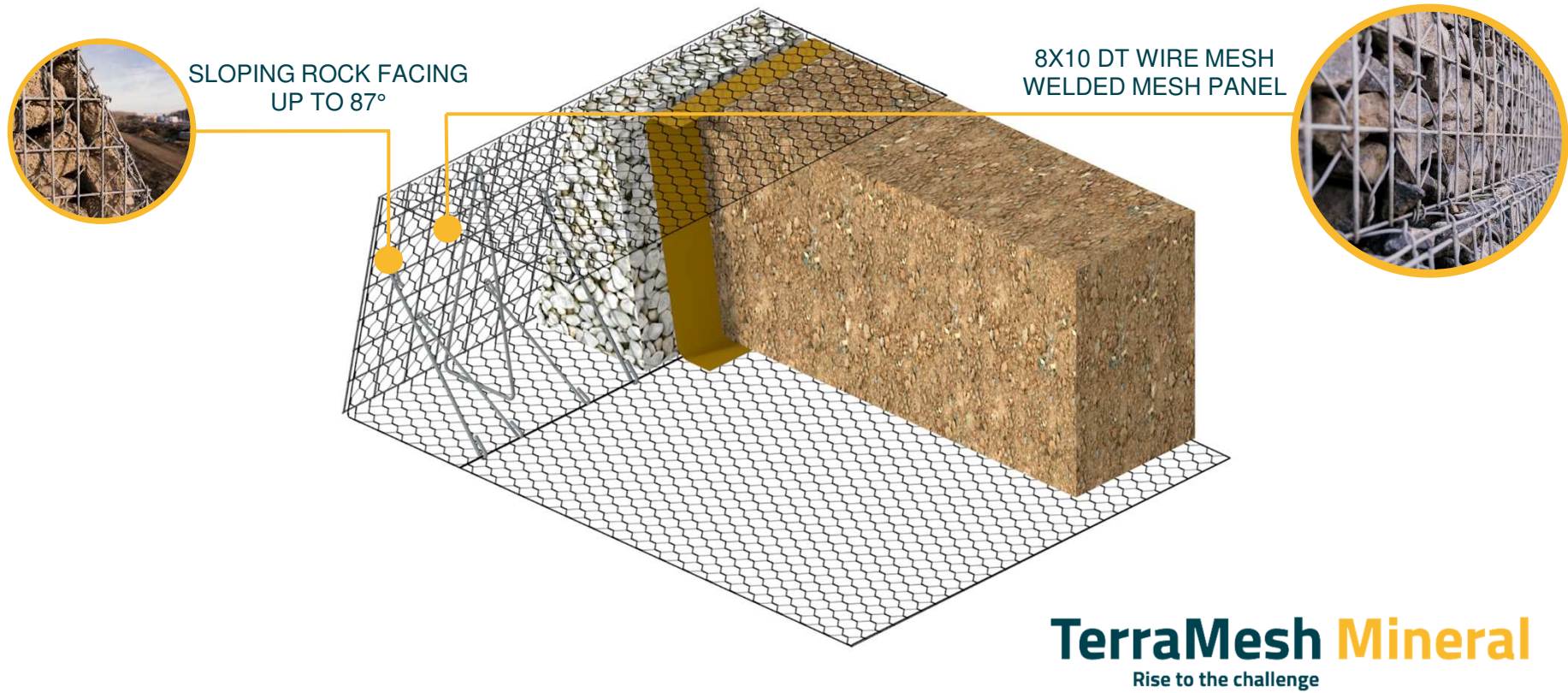
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**TerraMesh Mineral**  
Rise to the challenge

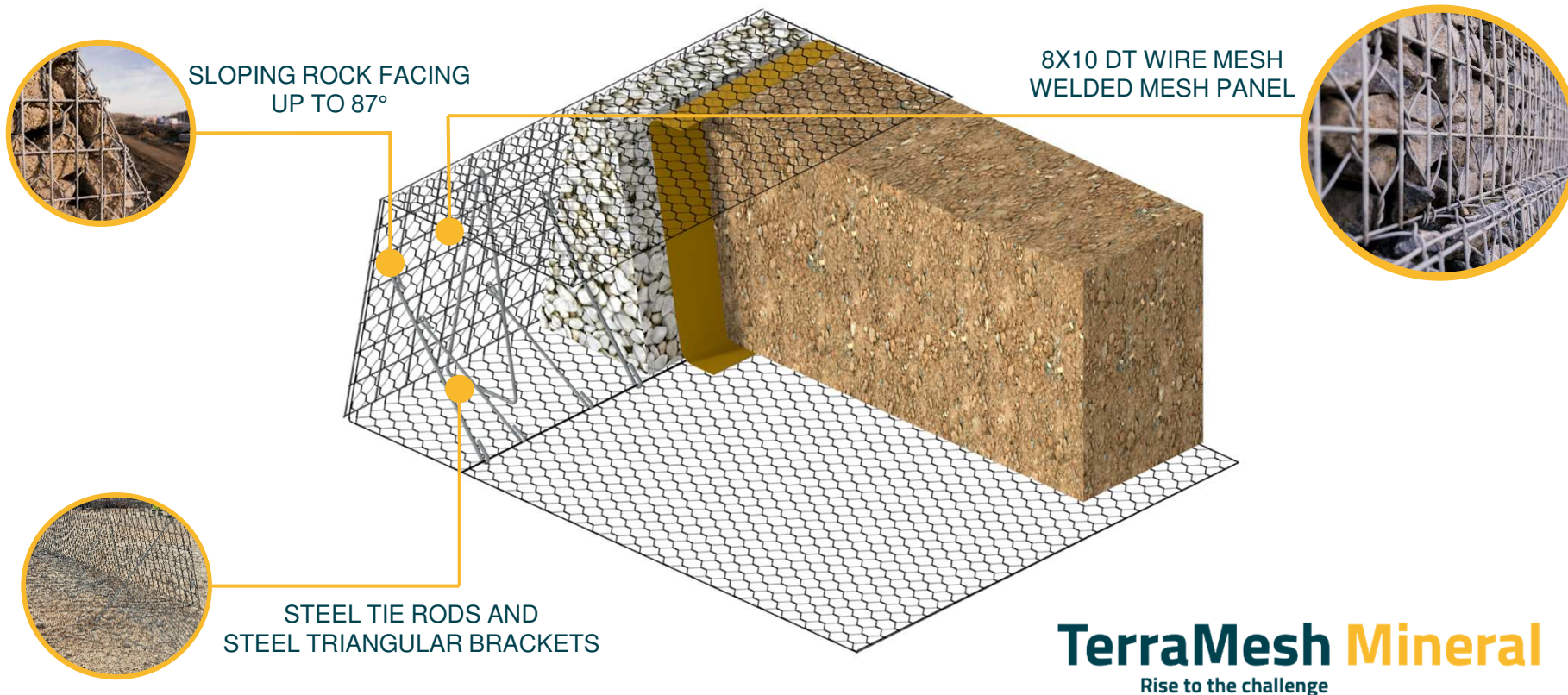
# TERRAMESH MINERAL

MACCAFERRI



# TERRAMESH MINERAL

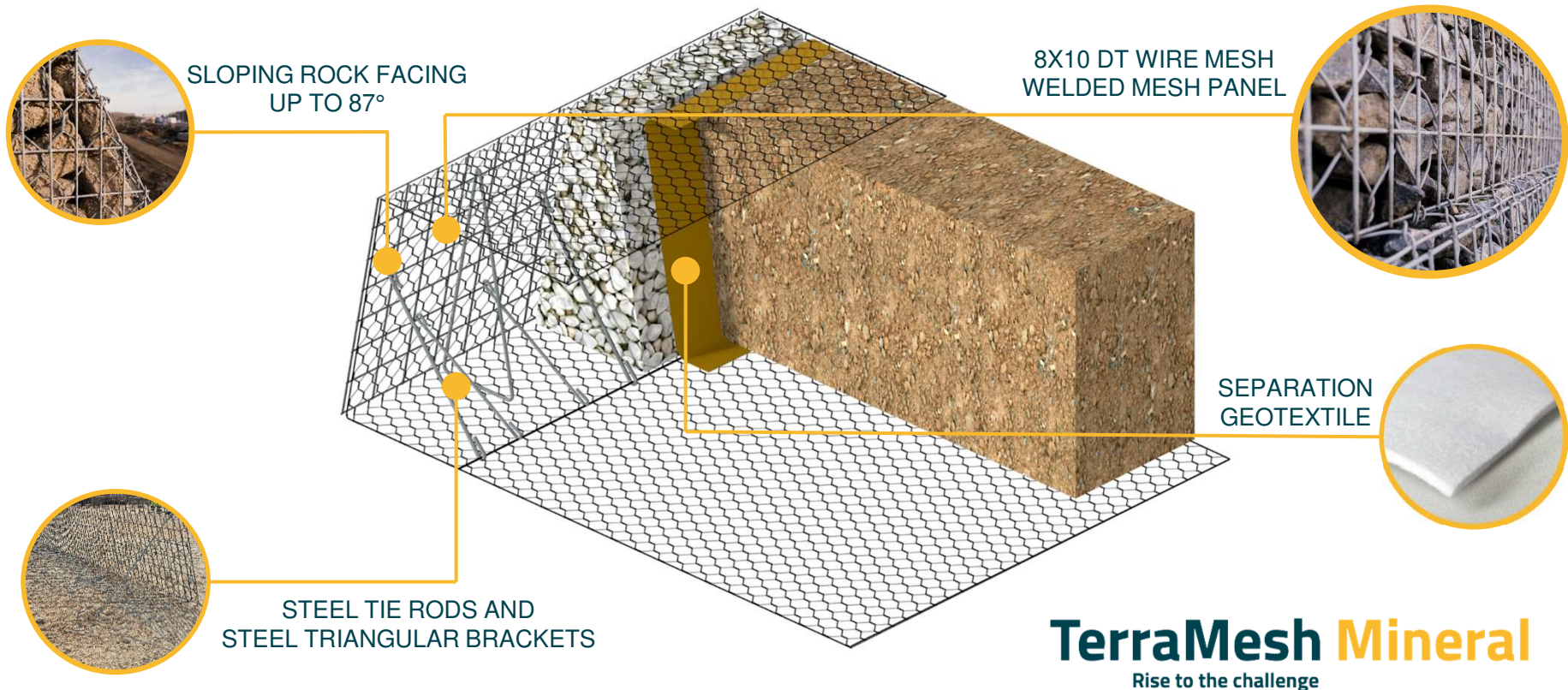
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**TerraMesh Mineral**  
Rise to the challenge

# TERRAMESH MINERAL

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## PRE-ASSEMBLED UNITS FOR A FAST INSTALLATION

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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

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MACCAFERRI





00:00:00



## THE CHALLENGE

MACCAFERRI

2 PRE-ASSEMBLED UNITS OF **TERRAMESH GREEN**

4.56 m<sup>2</sup> INSTALLED

21% WIDER



2 UNITS OF WRAP-AROUND SYSTEM

3.78 m<sup>2</sup> INSTALLED



## THE CHALLENGE

MACCAFERRI



## THE CHALLENGE

MACCAFERRI



## GEOGRIDS REINFORCEMENT

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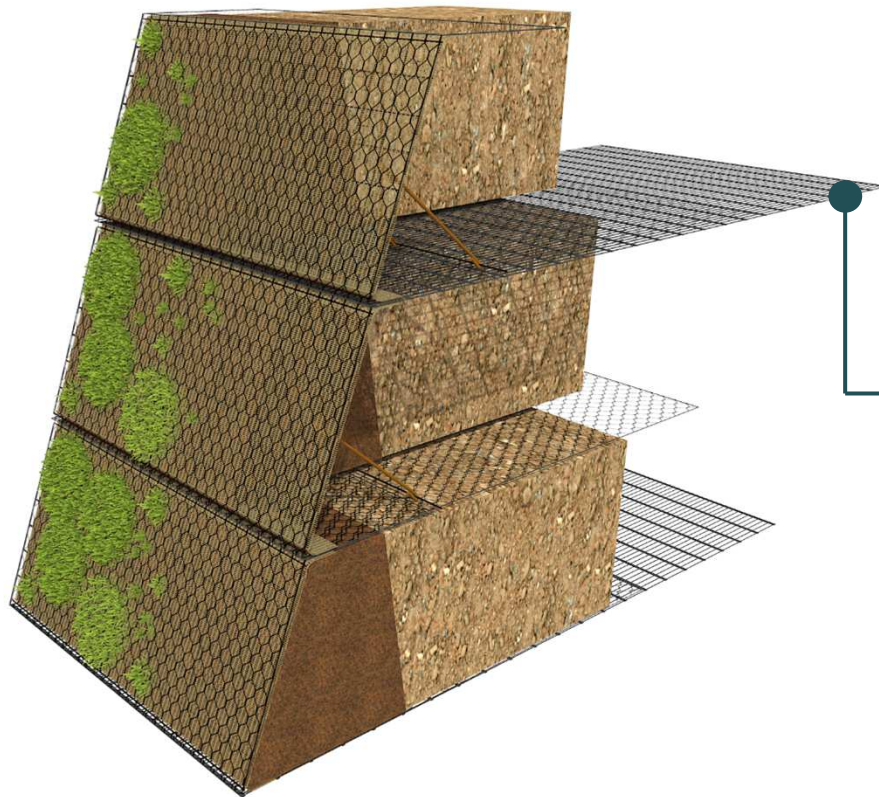
MACCAFERRI



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

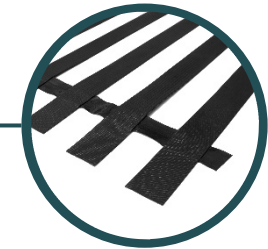
# GEOGRIDS REINFORCEMENT

MACCAFERRI



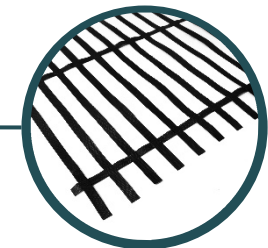
ParaLink

100 kN/m up to 1600 kN/m



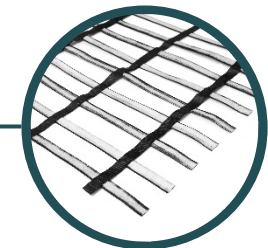
ParaGrid

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



ParaDrain

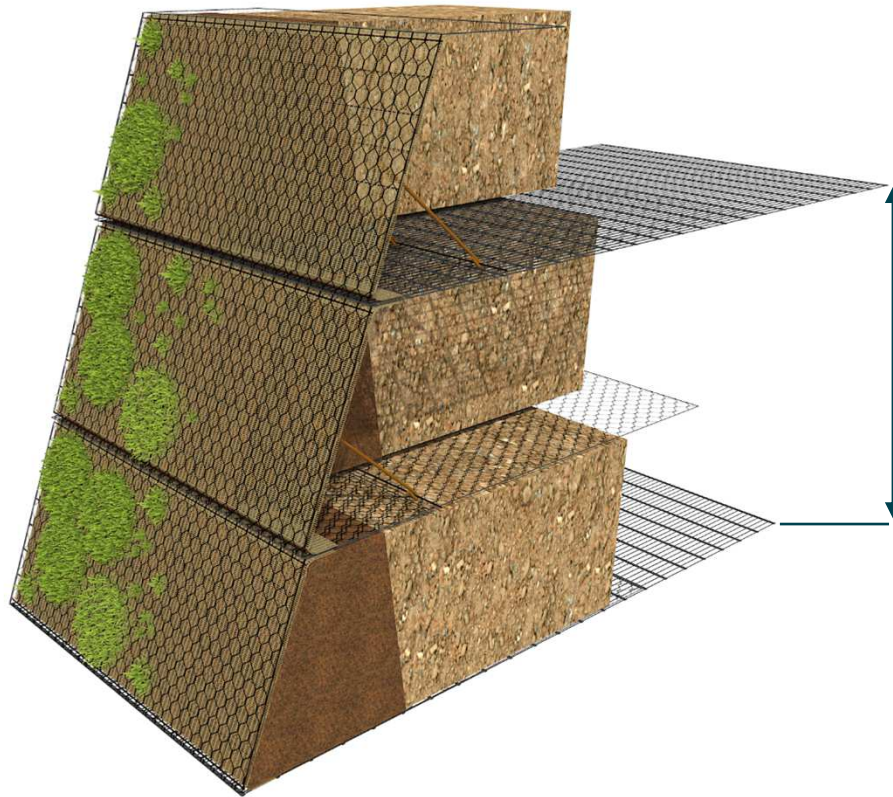
50 kN/m to 200 kN/m in the longitudinal direction



## GEOGRIDS REINFORCEMENT

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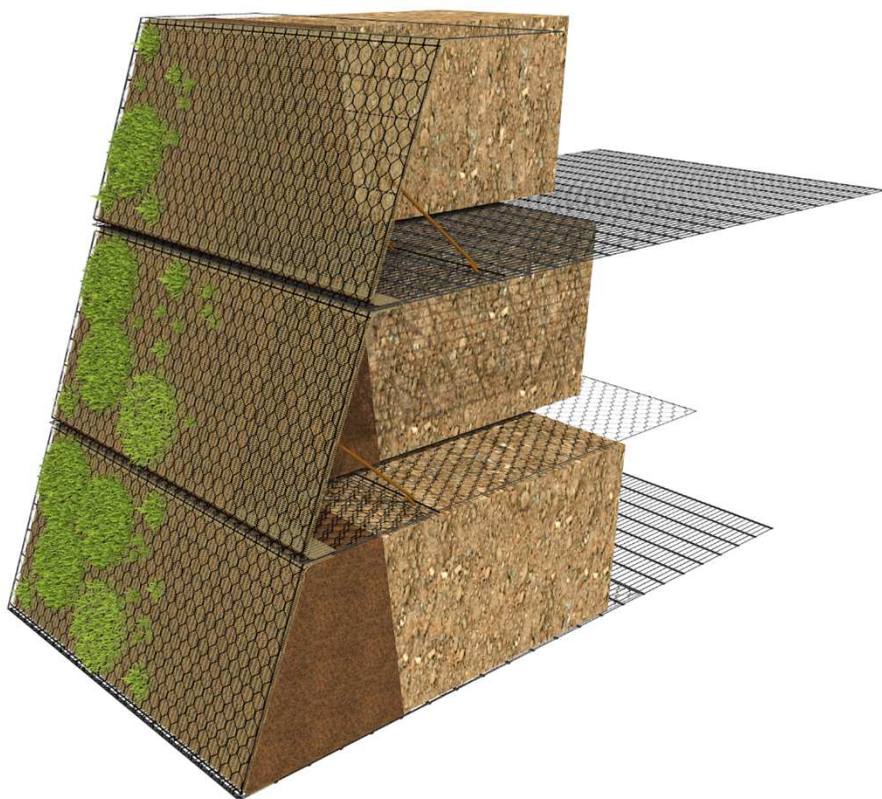


ParaLink, ParaGrid, ParaDrain:  
Maccaferri has a wide range of  
geogrids with a variety of polymers,  
configurations and strengths.

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**.

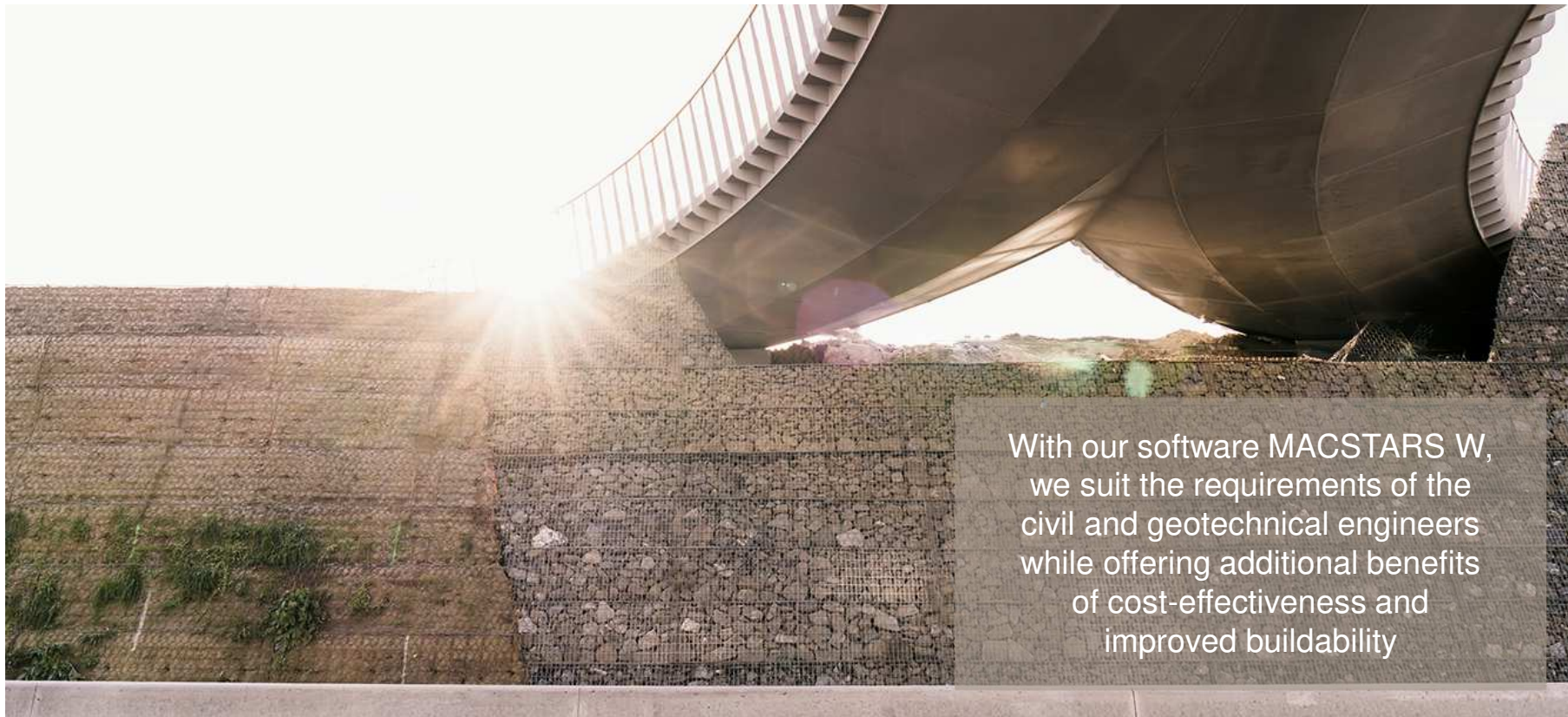


Paraproduct reinforcement enables the use of marginal soils making this solution feasible with any **locally available filling**.

## DESIGNING HYBRID STRUCTURES

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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



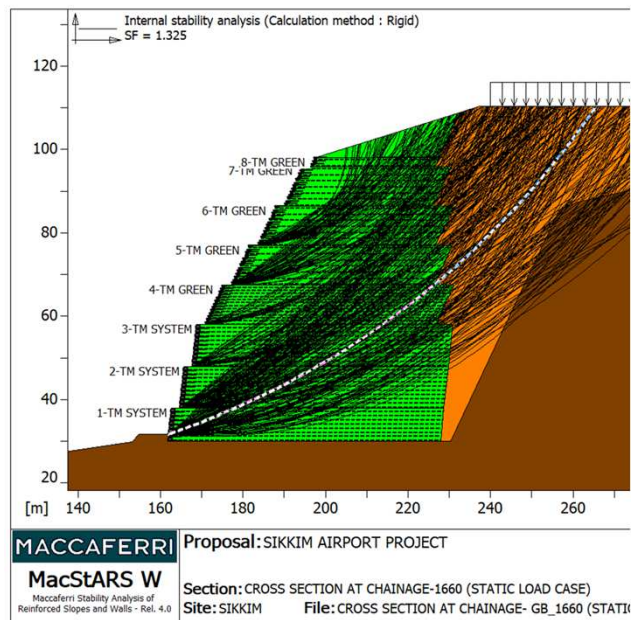
Would you like to download the software?  
Type "**SOFTWARE**" in the chat box!



# FROM MACSTARS W TO INSTALLED PROJECT

MACCAFERRI

Sikkim Airport Project, India



10,000+  
projects designed per year



## LONG-TERM BENEFITS

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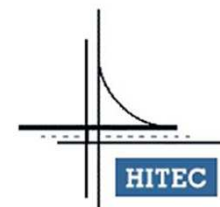
## CERTIFIED QUALITY

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MACCAFERRI

Why choosing a TerraMesh solution?

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



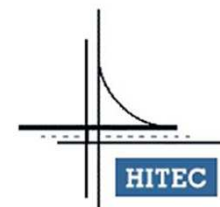
## CERTIFIED QUALITY

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MACCAFERRI

Why choosing a TerraMesh solution?

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



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

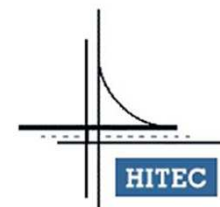
## CERTIFIED QUALITY

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MACCAFERRI

Why choosing a TerraMesh solution?

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



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

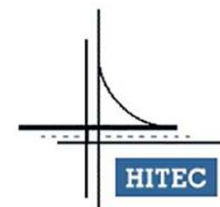
## CERTIFIED QUALITY

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MACCAFERRI

Why choosing a TerraMesh solution?

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



Continuous control  
of product  
performance in  
compliance with EU  
legislation

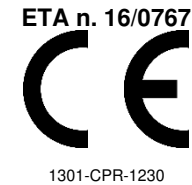
## CERTIFIED QUALITY

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MACCAFERRI

Why choosing a TerraMesh solution?

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



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

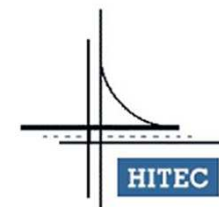
## CERTIFIED QUALITY

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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 kgCO<sub>2</sub>eq)



## OUR BEST PROJECTS AROUND THE WORLD

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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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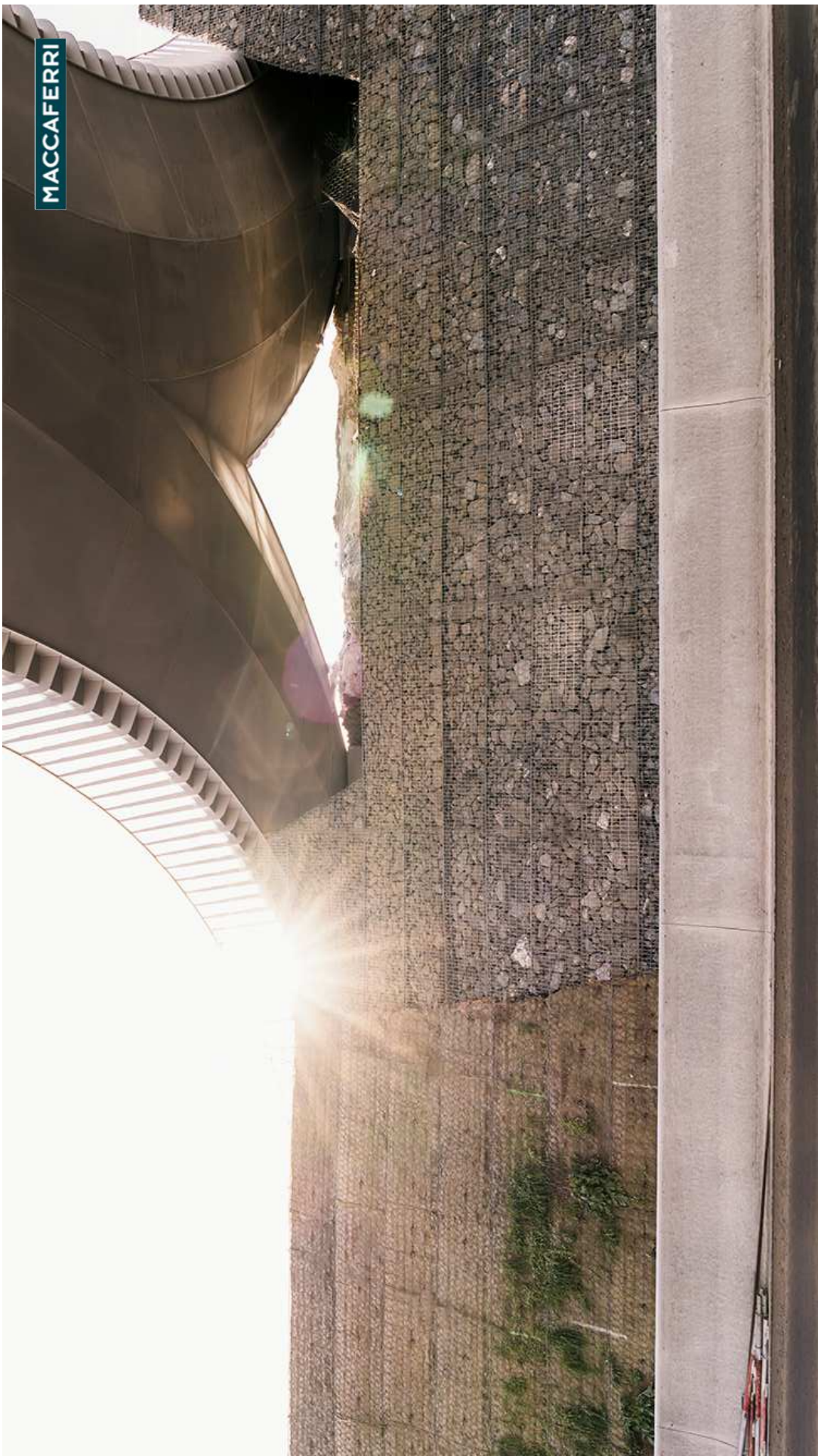
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### ANTWERP'S OOSTERWEEL LINK Antwerp, Belgium



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# 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 - PARAGRID™ 120,000 m2

Date of construction: 04/2018 - ONGOING

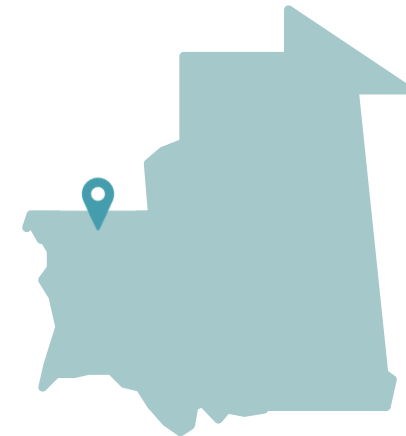
## OUR BEST PROJECTS AROUND THE WORLD

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**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 m<sup>2</sup> -  
PARALINK™ 45,000 m<sup>2</sup>

Date of construction: 09/2017 - 03/2018

## OUR BEST PROJECTS AROUND THE WORLD

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### 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

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**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

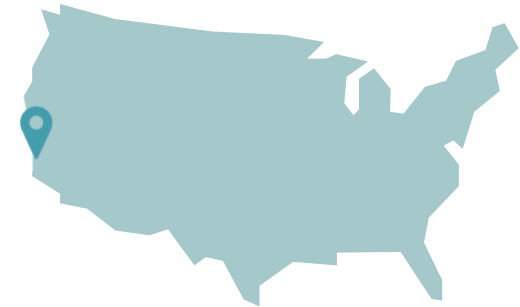
## OUR BEST PROJECTS AROUND THE WORLD

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**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*

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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**PERILAGO PATH**  
Pcia. - Mendoza, Potrerillos, Argentina



MACCAFERRI



# PERILAGO PATH

*Our contribution to the reconstruction of route 82*

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Client: DIRECCIÓN PROVINCIAL DE VIALIDAD DE MENDOZA

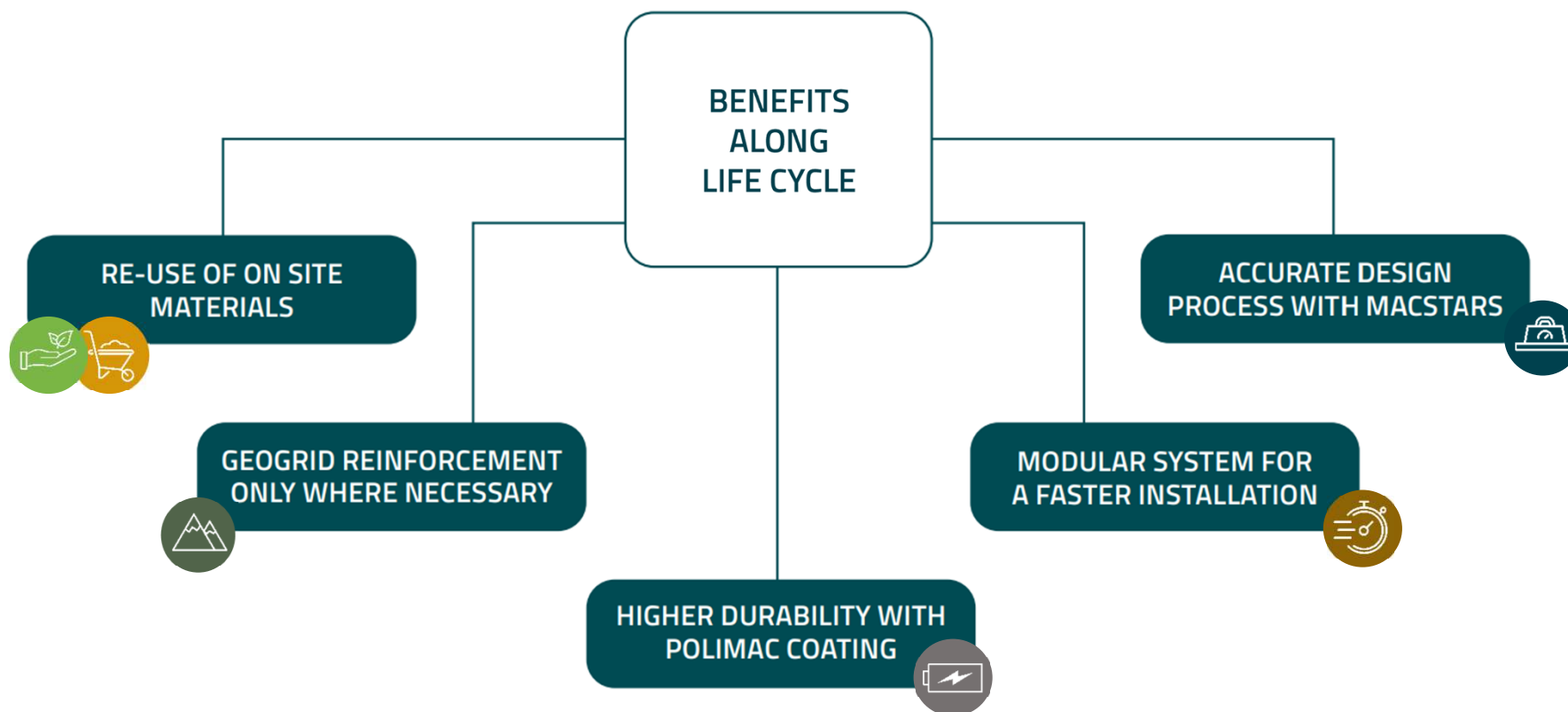
Contractor: UTE HOMAQ - ROVELLA - PAEDILLE

Products used (Qty.): TERRAMESH™ 3,965 m<sup>2</sup> - GABION™ 94,5 m<sup>3</sup> - RENO MATRESS 2,190 m<sup>2</sup>

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!**