



ENGINEERING LANDFILL COMPLIANCE: SUSTAINABLE SOLUTIONS FOR EVERY PHASE

MACCAFERRI



20' Every step of the project

5' Our Portfolio

10' Conclusions

Live Q&A Session

Speaker

S. De Carlo – Group Marketing Operations Manager





Founded in 1879, Maccaferri is a leader in innovative and sustainable solutions to overcome environmental, geotechnical, hydraulic and erosion problems.

130+

COUNTRIES

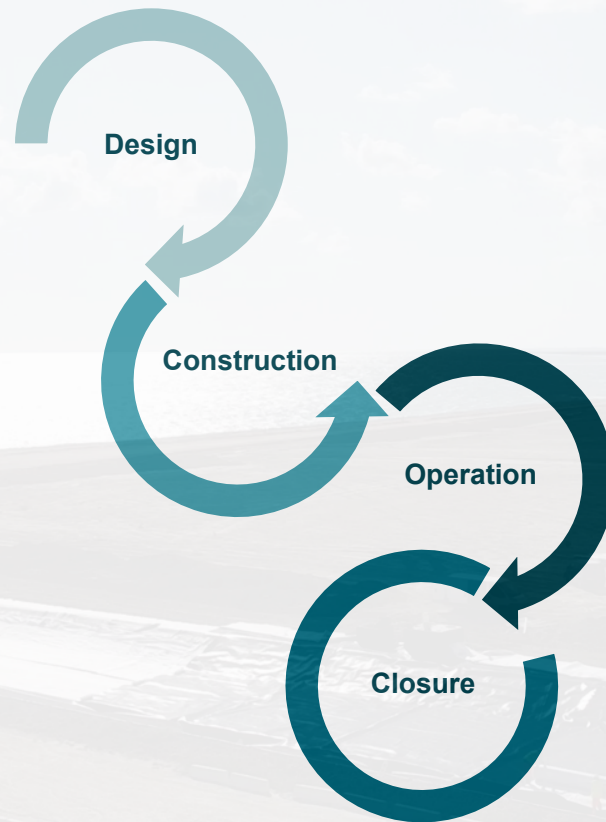
20+

FACTORIES

3500+

INNOVATORS

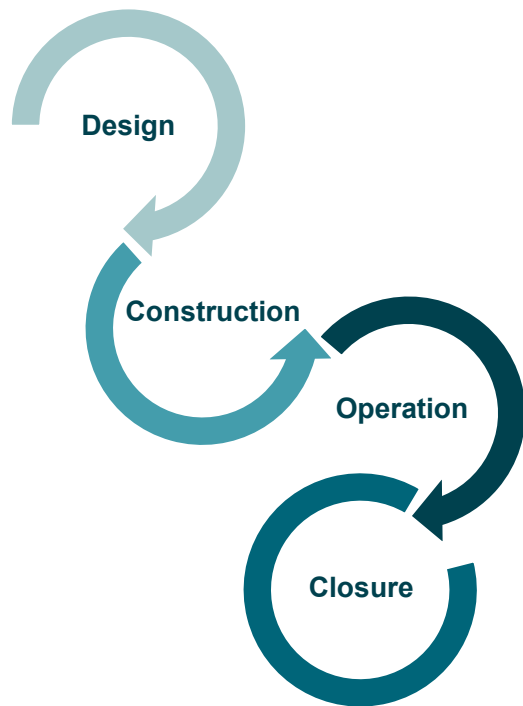




EVERY STEP OF THE PROJECT

MACCAFERRI

One company for every solution



Biaxial Geogrids



MonoAxial GeoGrids



Geotextiles (Woven PP & PET and NonWovens)



Multicomposites



Geocells



Geomembranes (Polymeric & Tarps)



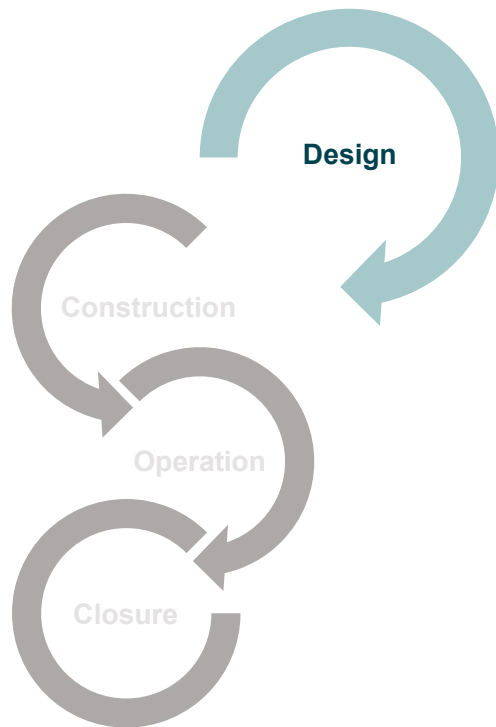
Geosynthetic Clay Liners (GCLs)



Geomats & TRM



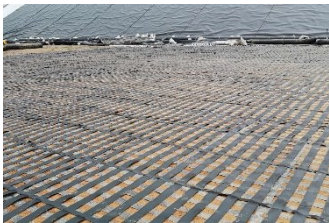
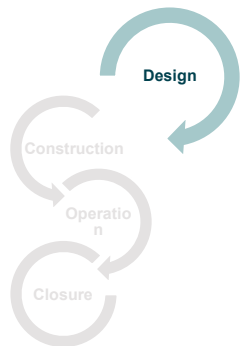
Drainage Geocomposites



We collaborate with designers and project owners to match landfill requirements while ensuring compliance with environmental and safety regulations.

EVERY STEP OF THE PROJECT

Maccaferri's Role



■ **Geotechnical Expertise:** Ensuring soil bearing capacity and slope stability through advanced engineering solutions.



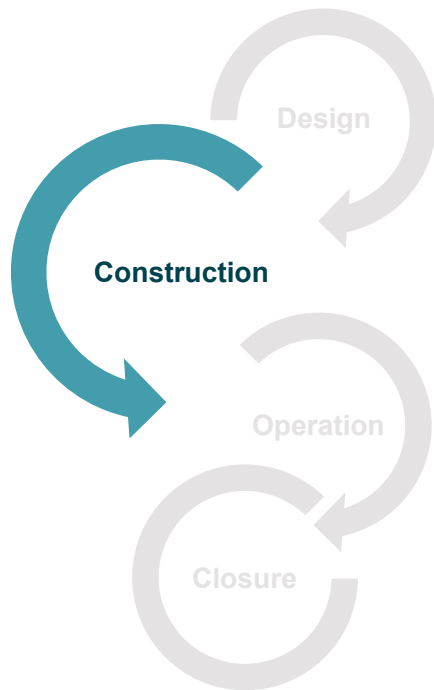
■ **Waterproofing know-how:** Providing expertise on impermeabilization and drainage systems to effectively manage water infiltration and leachate control.



■ **Containment Solutions:** Recommending and supplying innovative barrier systems tailored to specific project needs.

EVERY STEP OF THE PROJECT

Maccaferri's Approach



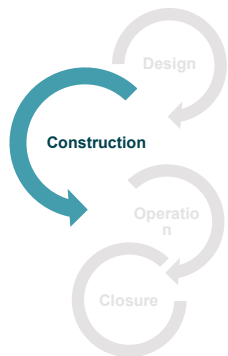
Maccaferri supplies high-quality, innovative materials that enhance the stability, durability, and environmental safety of landfill projects.

We work closely with contractors and project teams to ensure our materials are installed effectively and perform to the highest standards.

EVERY STEP OF THE PROJECT

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Maccaferri's Approach



■ **High-Quality Materials:** A comprehensive portfolio including geogrids, geomembranes, drainage systems, and soil reinforcement solutions.



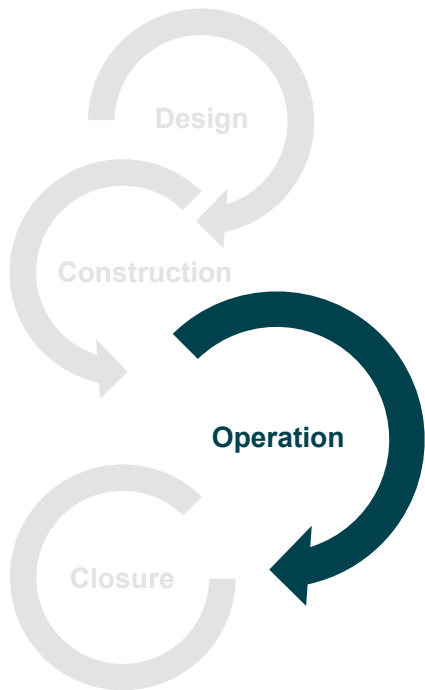
■ **Technical Guidance for Installation:** Offering expertise and best practices to ensure correct material application and optimal performance.



■ **Optimizing Collateral Infrastructure Elements:** Supplying solutions for storage yards, access roads, and landfill cell reinforcement to support heavy machinery operations.

EVERY STEP OF THE PROJECT

Maccaferri's Leadership in Landfill Operation

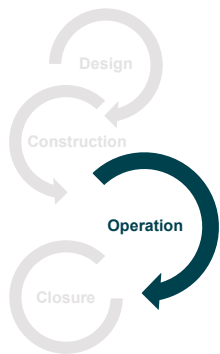


By supplying innovative materials and technical expertise, we help landfill operators maximize capacity and ensure safe, long-term operation.

Maccaferri's solutions extend the operational life and efficiency of landfills by enhancing their structural integrity, minimizing social and environmental impact on communities, and maximizing storage capacity without increasing the occupied surface area.

EVERY STEP OF THE PROJECT

Maccaferri's Leadership in Landfill Operation



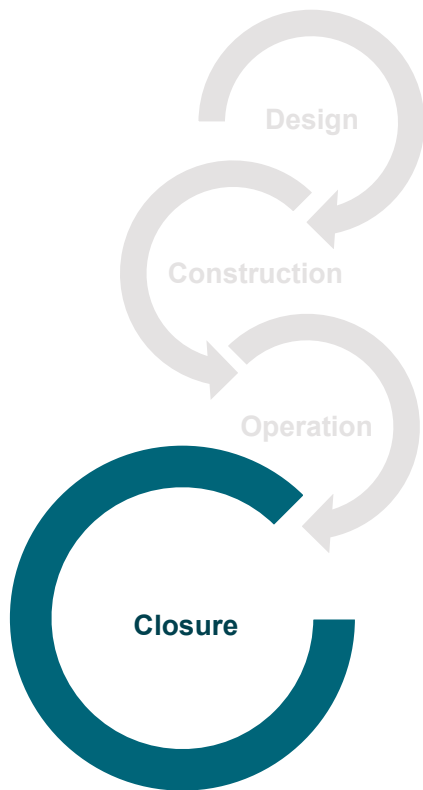
- **Reinforcement and Stabilization Solutions:** Geotechnical systems for waste stabilization and enhanced landfill slope inclination, ensuring stability and maximizing volume capacity.



- **Space Optimization Technologies:** Materials that allow for greater waste storage capacity and improved operational efficiency.



- **Expertise in Settlement Management and Piggybacking Solutions:** Geosynthetic solutions designed to manage landfill settlements over time, ensuring stability and functionality while maximizing storage capacity.

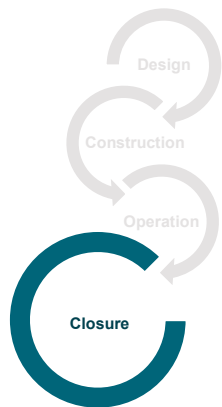


As landfills reach the end of their lifecycle, Maccaferri provides materials and technical expertise to support effective closure and environmental restoration. Our expertise ensures that closure systems are environmentally compliant, cost-effective, and designed for long-term land rehabilitation.

EVERY STEP OF THE PROJECT

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Maccaferri's Leadership in Landfill Operation



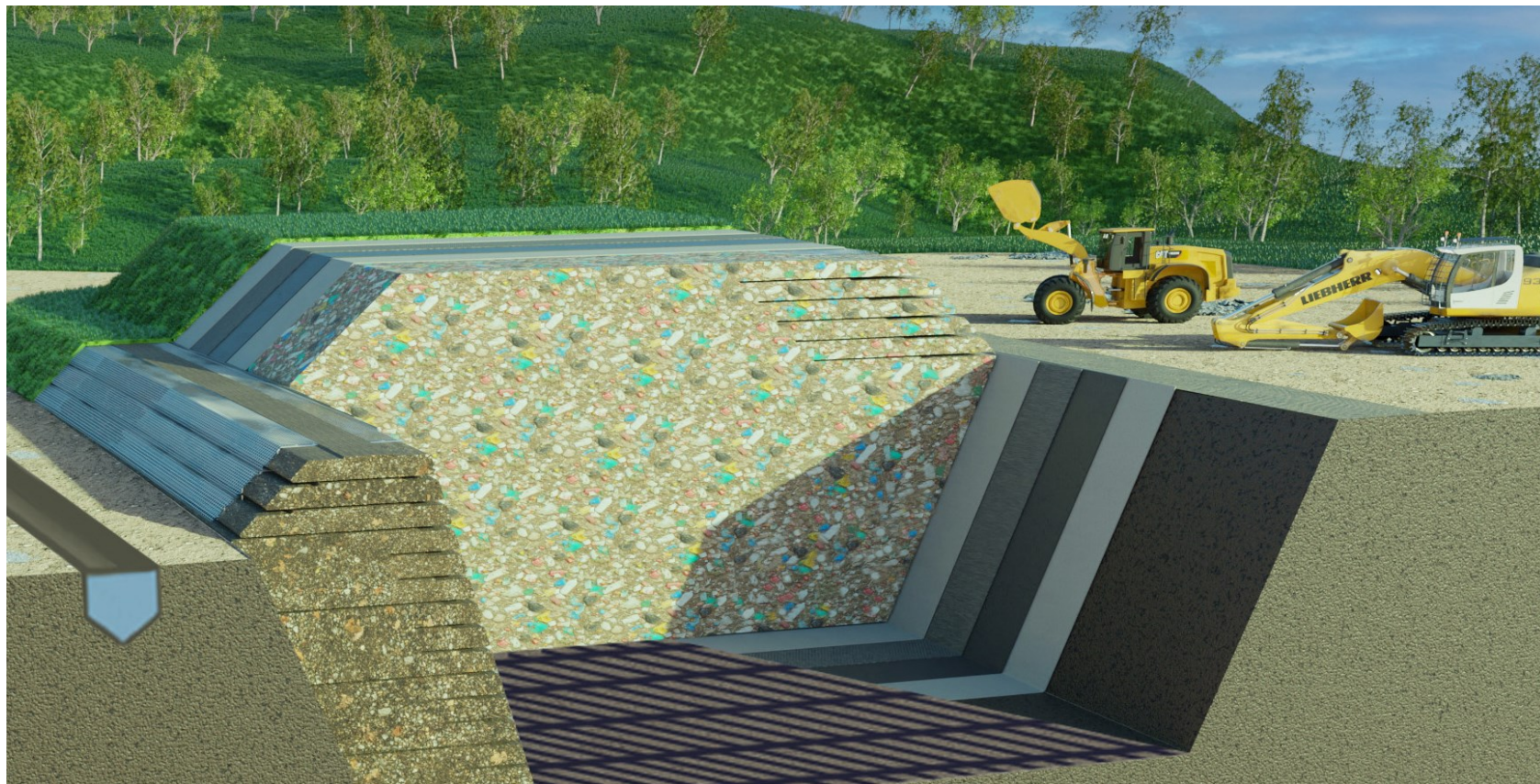
M Capping Systems: Supplying durable, sustainable cover solutions that minimize environmental impact and ensure long-term stability.

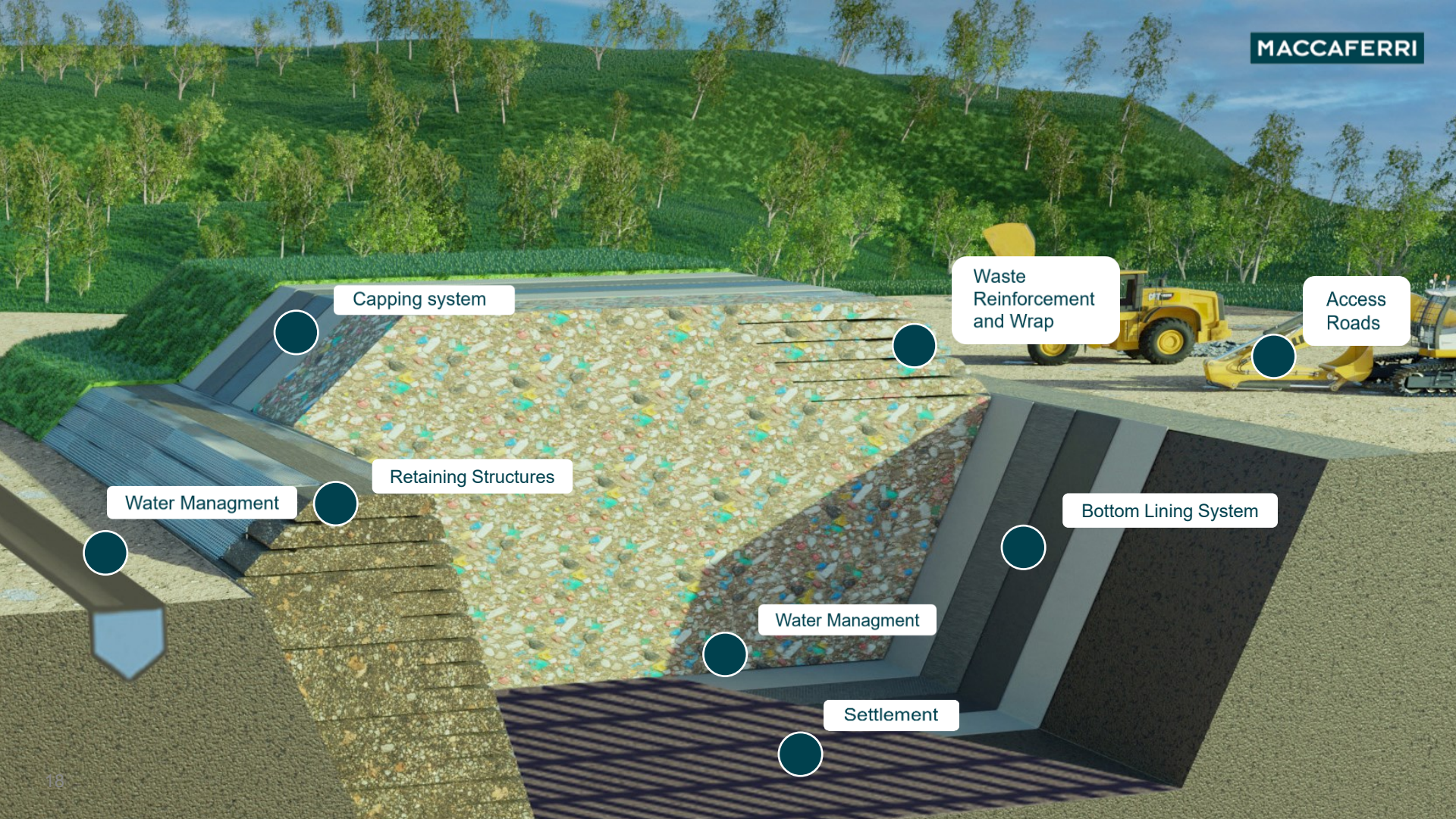


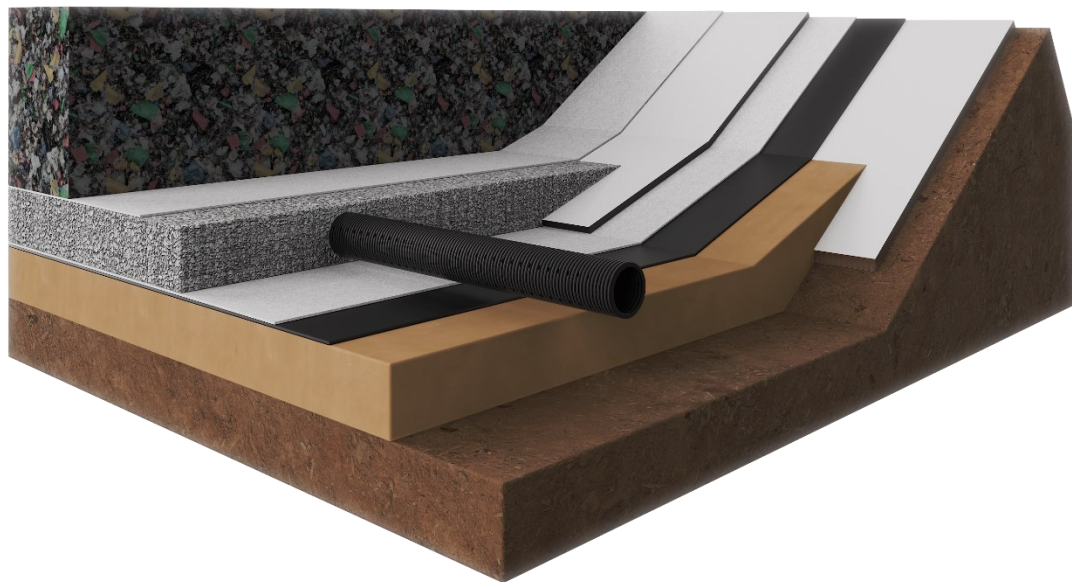
M Tailored Engineering Solutions: Utilizing our global expertise to deliver tailored landfill closure techniques and materials.



M Landfill Revegetation: Expertise in providing green cover solutions and revegetation technologies for landfill sites.



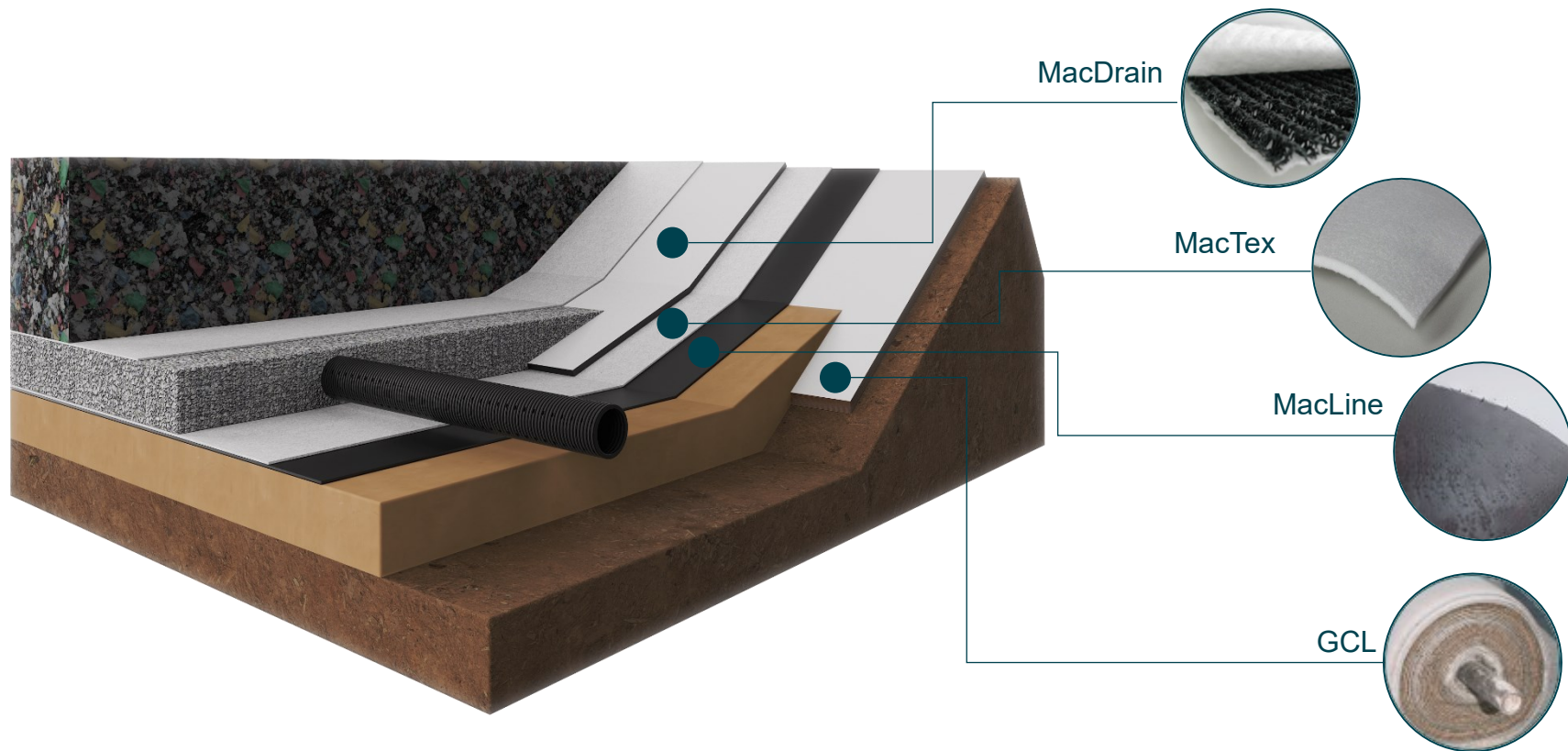




Bottom lining systems are crucial to prevent leachate contamination and protect groundwater in landfill sites. Maccaferri provides comprehensive solutions for landfill lining, ensuring safety, durability, and environmental compliance.

BOTTOM LINING SYSTEM

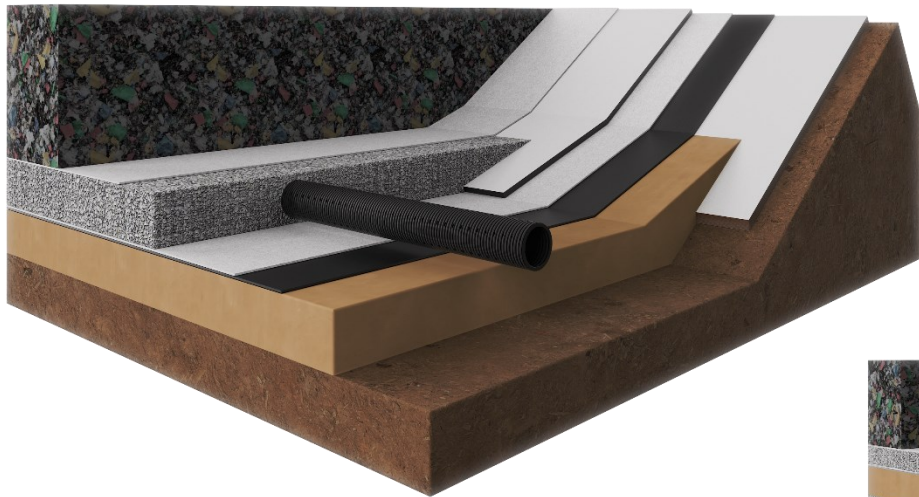
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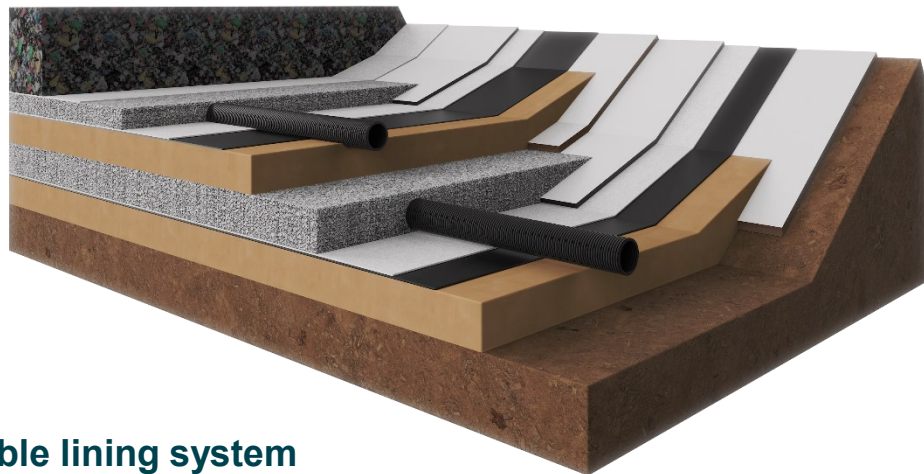
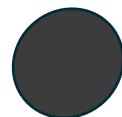
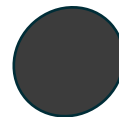
BOTTOM LINING SYSTEM

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Double Lining System



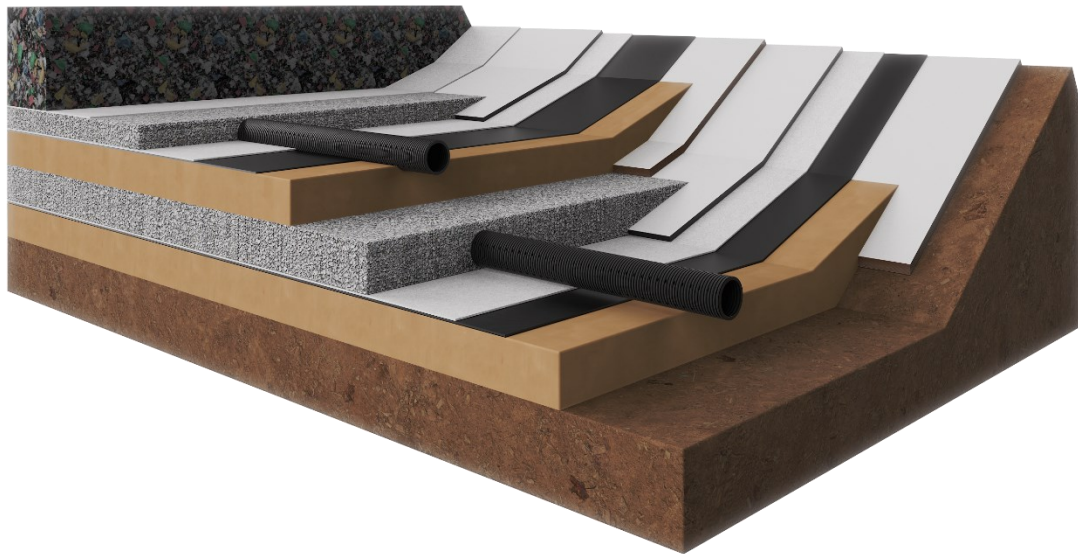
Single lining system



Double lining system

BOTTOM LINING SYSTEM

Double Lining System



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- Low permeability layer (typically not higher than 1×10^{-9} m/sec) with a variable thickness
- HDPE geomembrane (typically, in Europe, not thinner than 2.5 mm)
- Drainage system to detect failures in the first lining (optional)
- Second low permeability layer (typically not higher than 1×10^{-9} m/sec) having a variable thickness (0.5 – 1.0 m) or, as a typical alternative, a geocomposite-clay liner barrier;
- Second HDPE geomembrane (typically, in Europe, not thinner than 2.5 mm); The standard drainage layer to collect and convey the leachate.

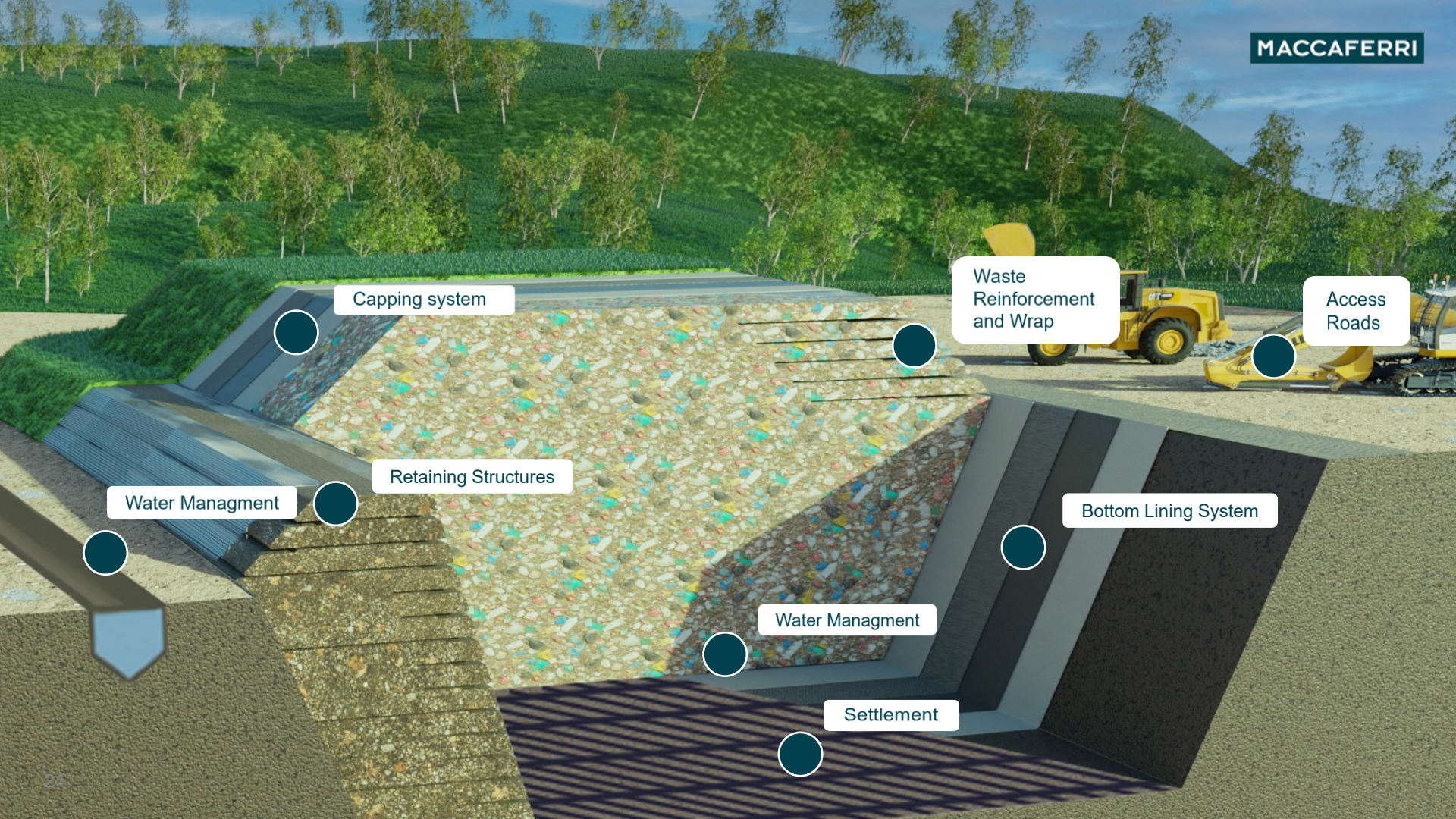
BOTTOM LINING SYSTEM

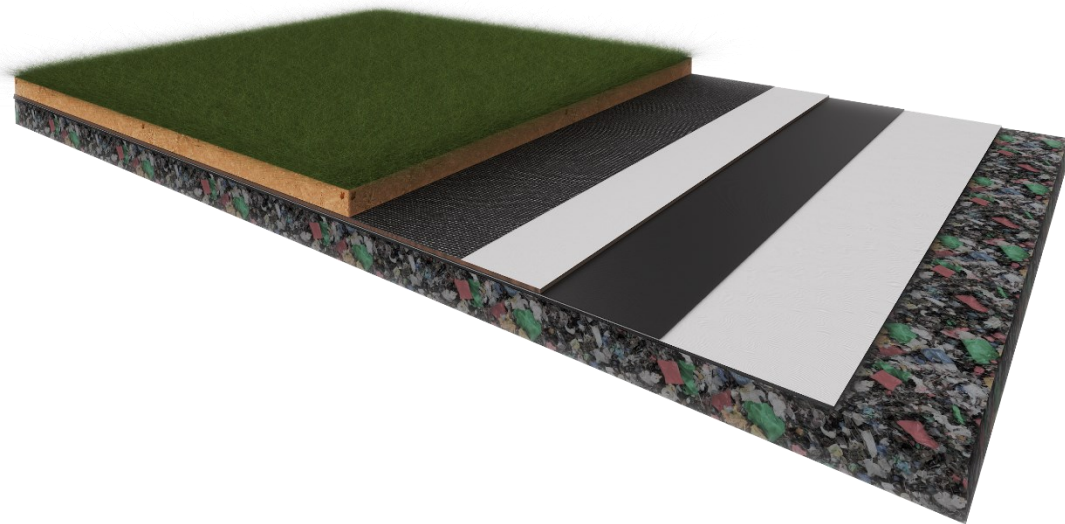
Advantages of Geosynthetics



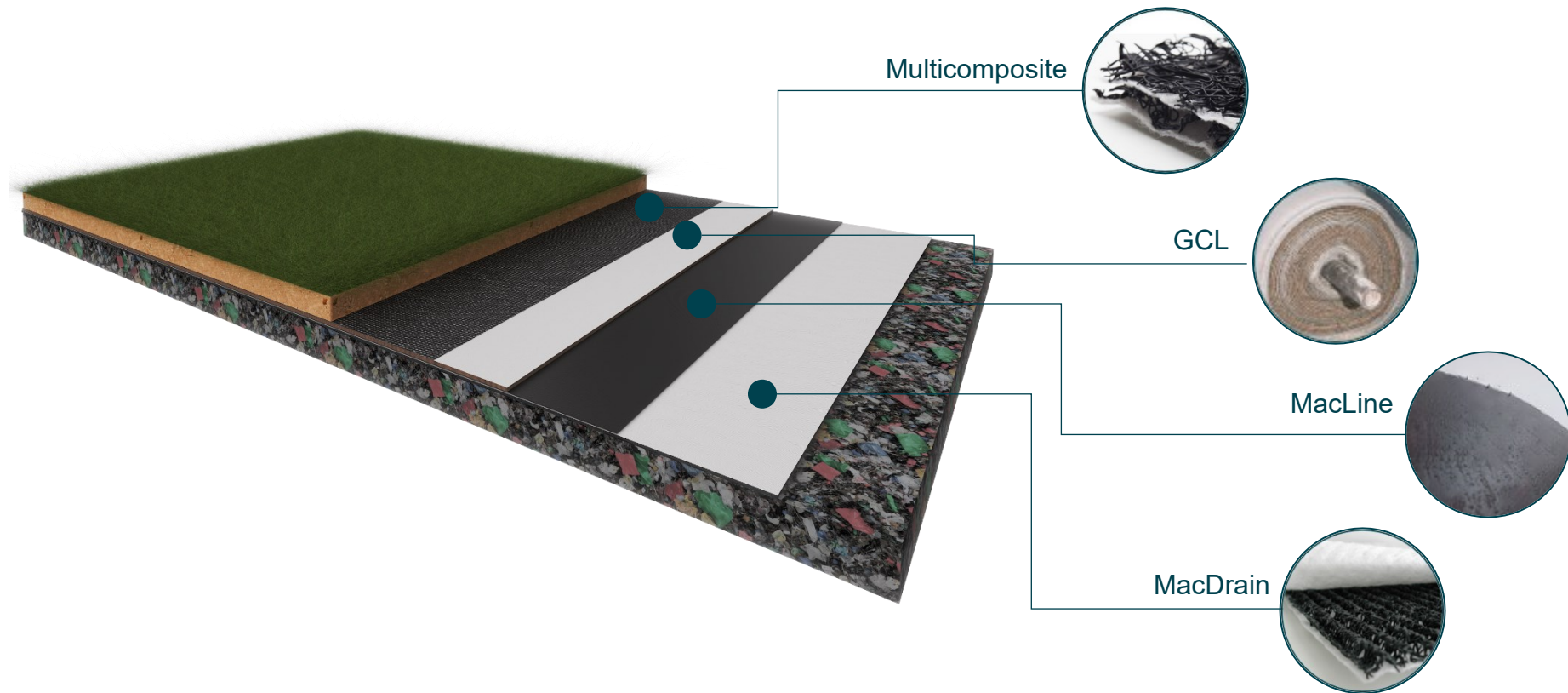
The use of geosynthetic materials instead of natural layers offers the following benefits:

- **Increase in waste storage volumetric capacity.** Geosynthetics are designed to optimize available space, allowing for higher storage capacity.
- **Ability to steepen lateral slopes.** This contributes to:
 1. Further increasing waste storage capacity.
 2. Reducing storage costs for the same waste volume by making better use of the available space.





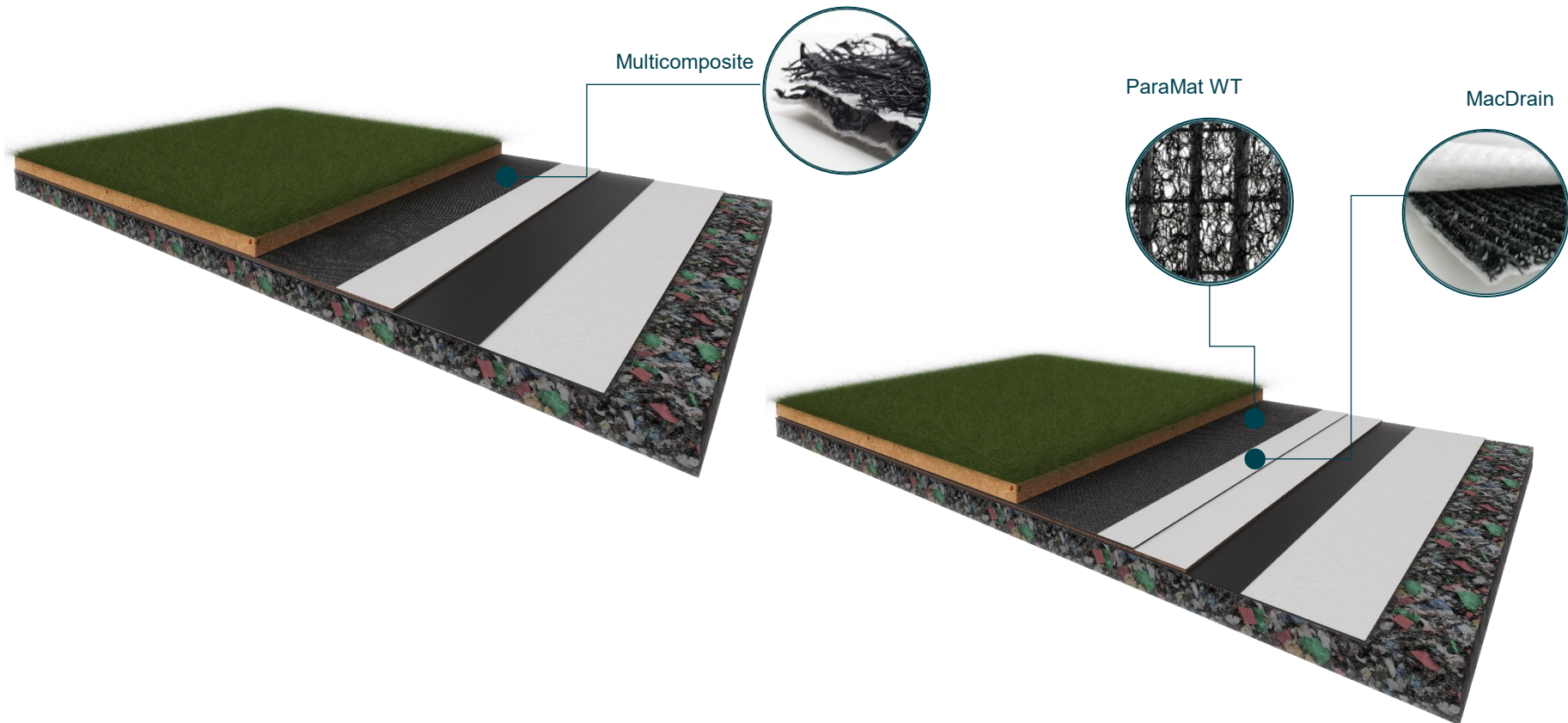
Capping systems are essential for the proper closure and environmental protection of landfills. Maccaferri offers a complete range of solutions for landfill capping, ensuring long-term performance, stability, and sustainability.

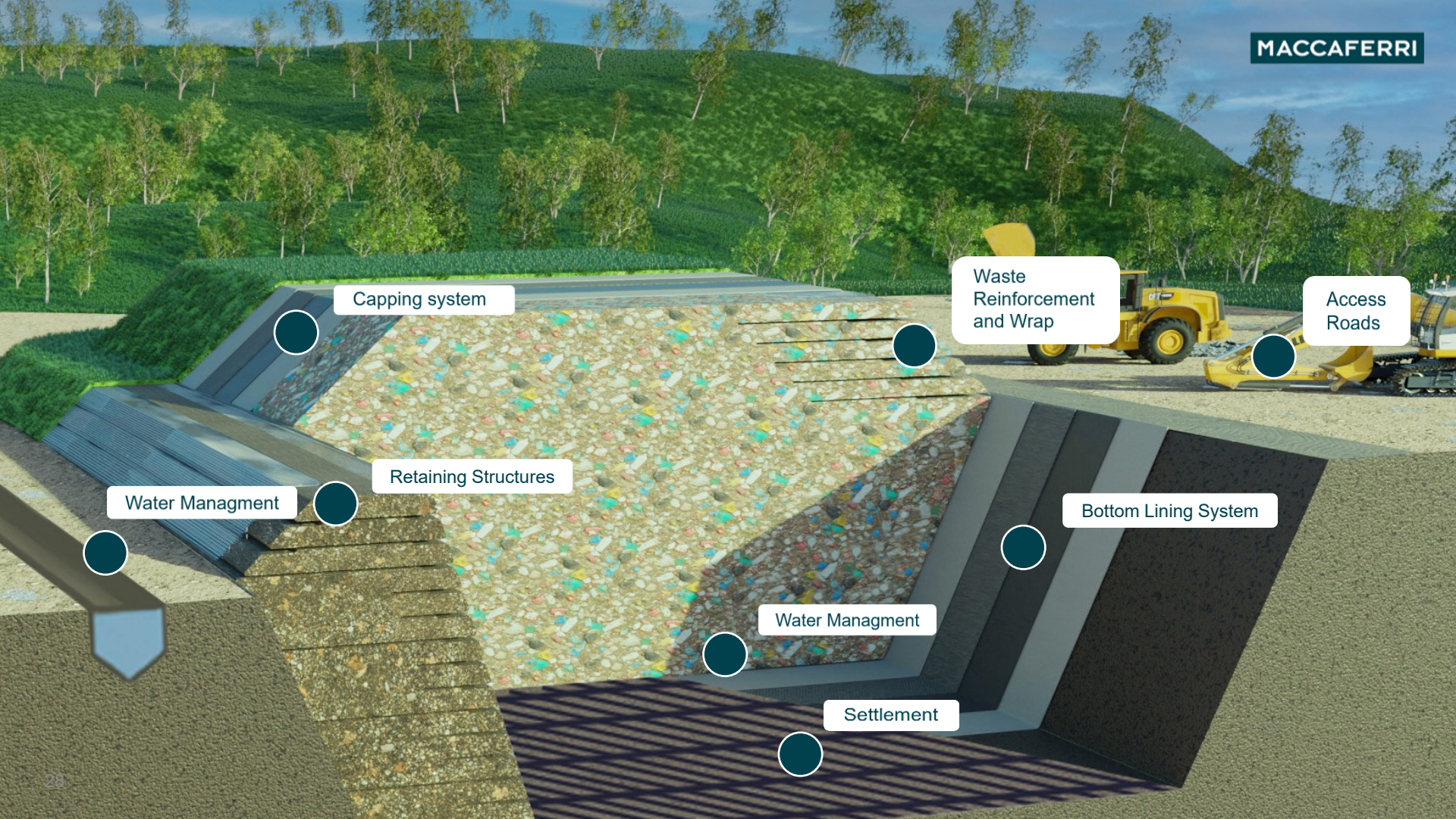


CAPPING SYSTEM

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Two different systems





Capping system

Waste
Reinforcement
and Wrap

Access
Roads

Retaining Structures

Water Managment

Bottom Lining System

Water Managment

Settlement

GLOBAL EXPERIENCE: LOCAL KNOWLEDGE

MACCAFERRI

Maccaferri projects all over the world



GLOBAL EXPERIENCE: LOCAL KNOWLEDGE

Our Success Story: Cava De Tirreni, Italy



Cava de' Tirreni, Italy

Maccaferri successfully rehabilitated the abandoned landfill in Cava de' Tirreni, Italy, using advanced geosynthetics to prevent contamination, improve drainage, and reinforce the soil. Their innovative multi-layered solution transformed the hazardous site into a safe, green area, benefiting the environment and local community.

GLOBAL EXPERIENCE: LOCAL KNOWLEDGE

Our Success Story: Yiyang, China



Yiyang, China

The gold mine closure project in Yiyang, Shangrao, Jiangxi Province, involves slope treatment, barrier layer installation, and soil covering to enhance stability and environmental restoration.

GLOBAL EXPERIENCE: LOCAL KNOWLEDGE

Our Success Story: Bani, República Dominicana



Bani, República Dominicana

The Punta Catalina power plant in the Dominican Republic, which generates 30% of the country's electricity, safely contains coal ash in geosynthetic-lined cells with triple-layer protection to prevent environmental contamination. This is the first internationally recognized sanitary landfill project in the Caribbean.

We prove We Care

A corporate Ethical Policy brings transparency, respect and accountability to our operations and interactions with clients.

Finally, our products are certified in accordance with internationally recognised standards and we are members of key industry organisations.

The Environmental Product Declaration (EPD) certificate quantifies our environmental impact allowing us to perform accurate LCA



We prove We Care

We are dedicated to addressing environmental, economic, and social aspects holistically.

We believe in sustainable approaches throughout a project's life cycle. From design to construction and decommissioning, our engineering solutions aim to create long-term benefits beyond the product itself.

Maccaferri solutions mitigate natural and human-made hazards, respect the environment, enhance safety, and improve lives. Inspired by the UN's urgent call to achieve the SDGs, we have committed to meeting these goals step by step.

We prove We Care



Maccaferri products exemplify top-tier quality, backed by certifications from renowned institutes and compliance with the latest standards.



Our offices and manufacturing facilities boast ISO certifications

Our products carry various certifications such as the CE mark, BBA Agrément Certificate, NTPEP, NF mark, COPRO mark



Solutions development

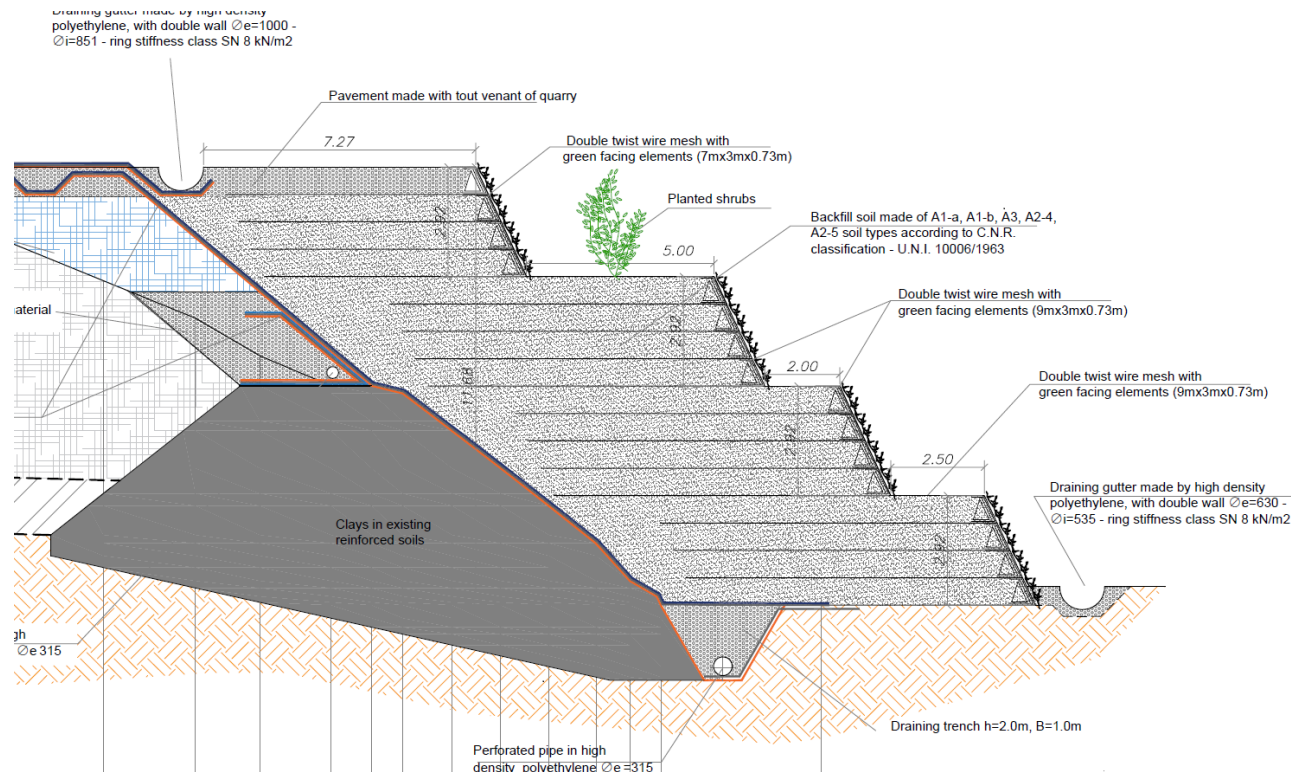
Design information sheet

Site consultation

Solution selection

Proposal drawing

Engineering estimates



TRUSTED FROM CONCEPT TO CLOSURE

MACCAFERRI

Design Assistance

Software design analysis

Contract drawing

Specifications



TRUSTED FROM CONCEPT TO CLOSURE

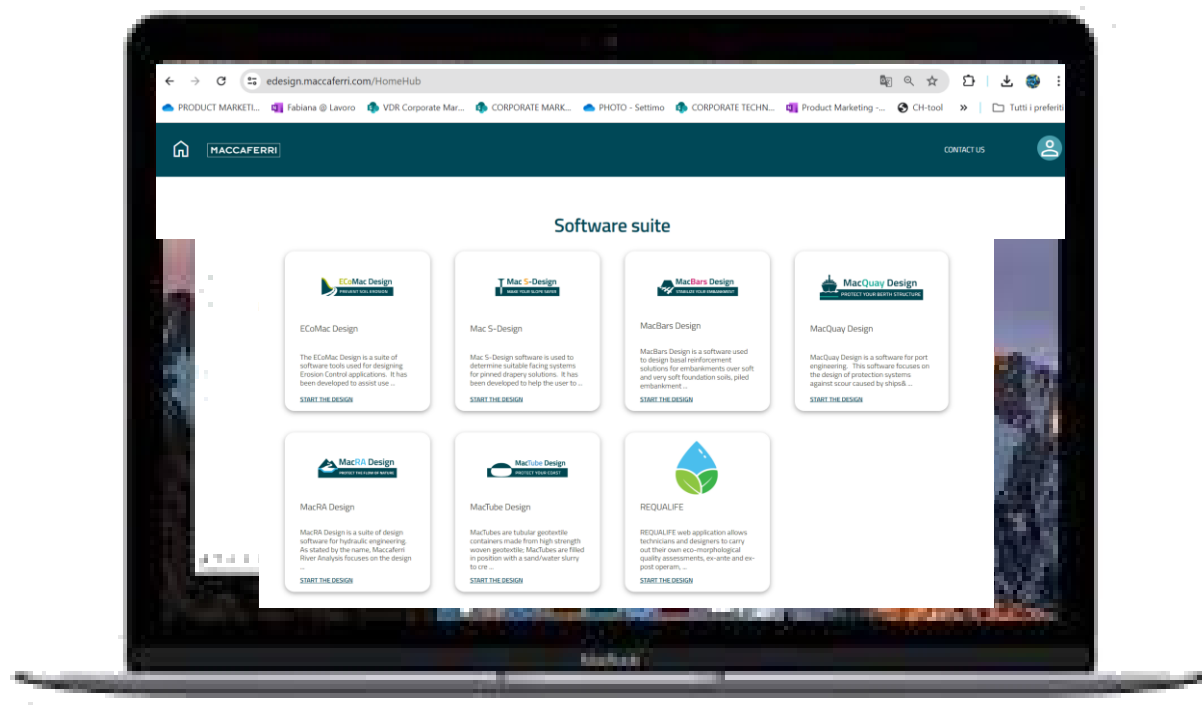
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Online Design Software

Developed with **top institutes and universities**, our **user-friendly software suite** empowers engineers to design effective, reliable civil engineering solutions. Based on **decades of field data and rigorous testing**, our freeware meets **global civil and geotechnical engineering standards**, offering cost-effectiveness and improved buildability.



Explore our
Software suite



Thank you!

Officine Maccaferri S.p.A.

T: +39 051 6436 000

E: info.hq@maccaferri.com

maccaferri.com

in Maccaferri
 MaccaferriWorld
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 MaccaferriWorld
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