



MACTUBE DESIGN

Geotextile Tubes Design Workshop

10 March, 2022

MACCAFERRI

WEBINAR AGENDA

MACCAFERRI



10' *Introduction*

40' *Workshop*

Live Q&A Session

Speaker

*P. Pezzano – Technical Expertise Center of Excellence GSY &
MacRes Business Unit*



37%

of the world's population live
within 100 km of the coast

34%

of the coasts are at high risk
of degradation

United Nations Environment Programme



Severe coastal degradation is affecting the whole world and it has been aggravated by **climate change**, **human activities** and heavy **population** pressure.





Coastal erosion becomes a hazard when society does not adapt to its effects on people, the built environment and infrastructure.

OUR COMMITMENT TO EROSION CONTROL

MACCAFERRI



We have worked for 140 years to provide solutions to limit erosion and protect coasts, estuaries, rivers and pipelines.

MacTube® was developed for coastal and marine engineering applications.

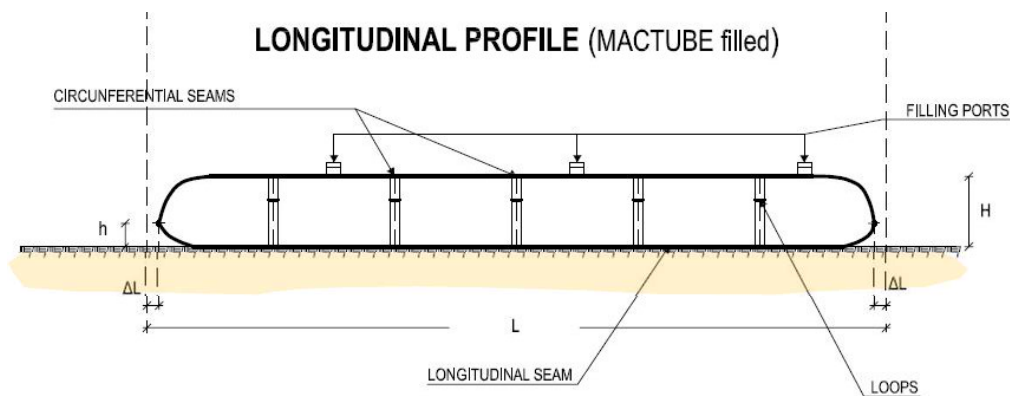


sea defences

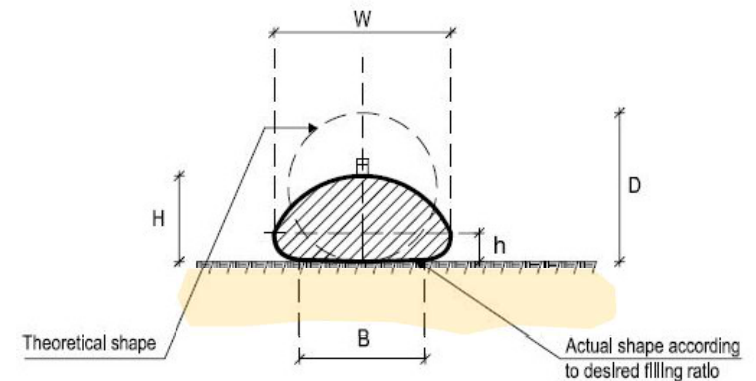
dune reconstruction

breakwaters and groynes

MacTubes® are made from a woven geotextile tube made of high tenacity polypropylene fibres with high strength seams, filled with slurried sand or similar.



TYPICAL SECTION (MACTUBE filled)



MACTUBE® STRENGTHS

MACCAFERRI

Geotextiles are engineered for maximum performance

Great mechanical resistance

High durability

Extended UV resistance

High strength seams

Several strengths, circumferences and lengths available

Environmentally friendly

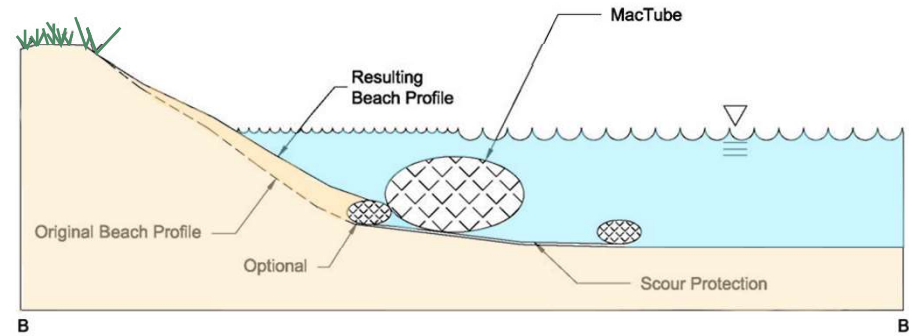
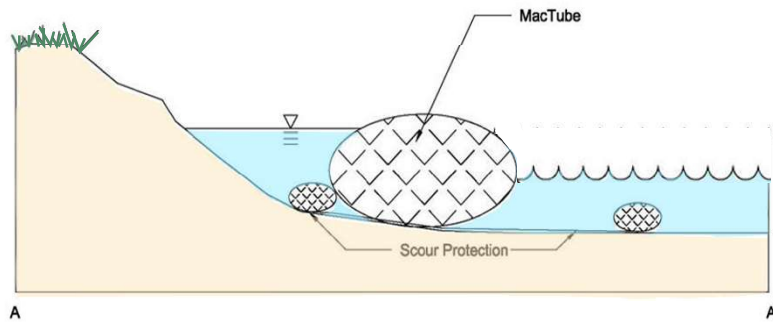
A solution that can be both permanent and temporary

Space saving



MACTUBE® IN THE CONSTRUCTION OF BREAKWATERS

MACCAFERRI



2009



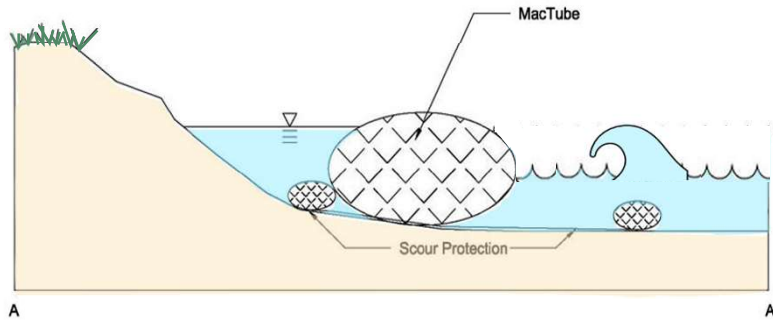
Mar de Plata,
Argentina

2015



MACTUBE® IN THE CONSTRUCTION OF BREAKWATERS

MACCAFERRI



Type of intended structure

Bathymetry

Area of intervention

Wave action

Type of sediment



THE NEW SOFTWARE TO PROTECT YOUR COAST

MACCAFERRI



MacTube Design enables designers to check the stability of MacTube geo-containers under wave attacks and choose the most suitable tube type to meet specific project requirements.

Time saving



User friendly



Available online



THE NEW SOFTWARE TO PROTECT YOUR COAST

MACCAFERRI



MacTube Design enables designers to check the stability of MacTube geo-containers under wave attacks and choose the most suitable tube type to meet specific project requirements.

Time saving



User friendly



Available online



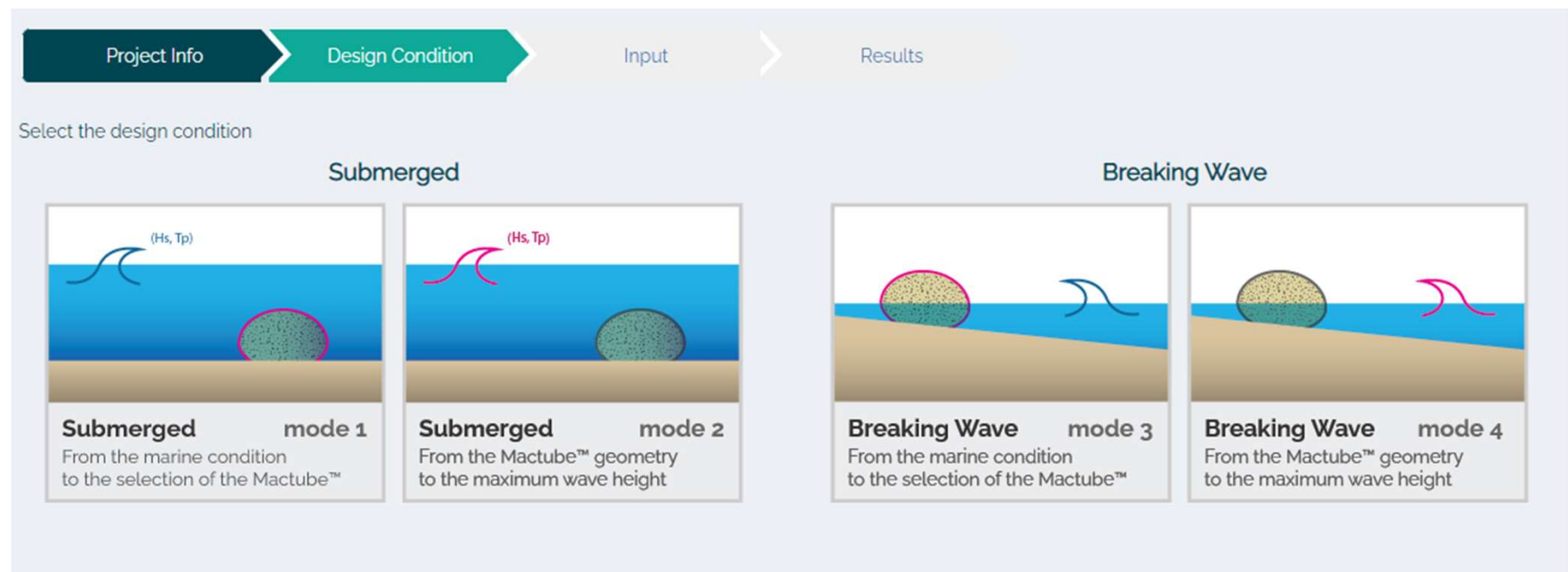
Visit our website!
edesign.maccaferri.com



HOW THE SOFTWARE WORKS

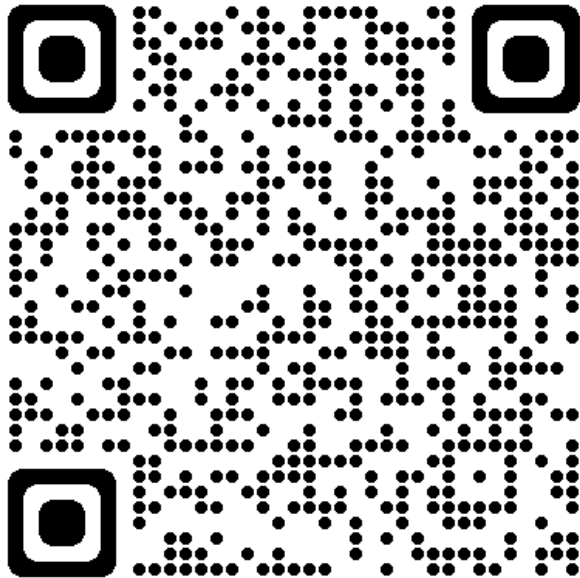
MACCAFERRI

MacTube Design permits the analysis of two different type of **structures** and enables the designer to start the analysis from two different **design conditions**.



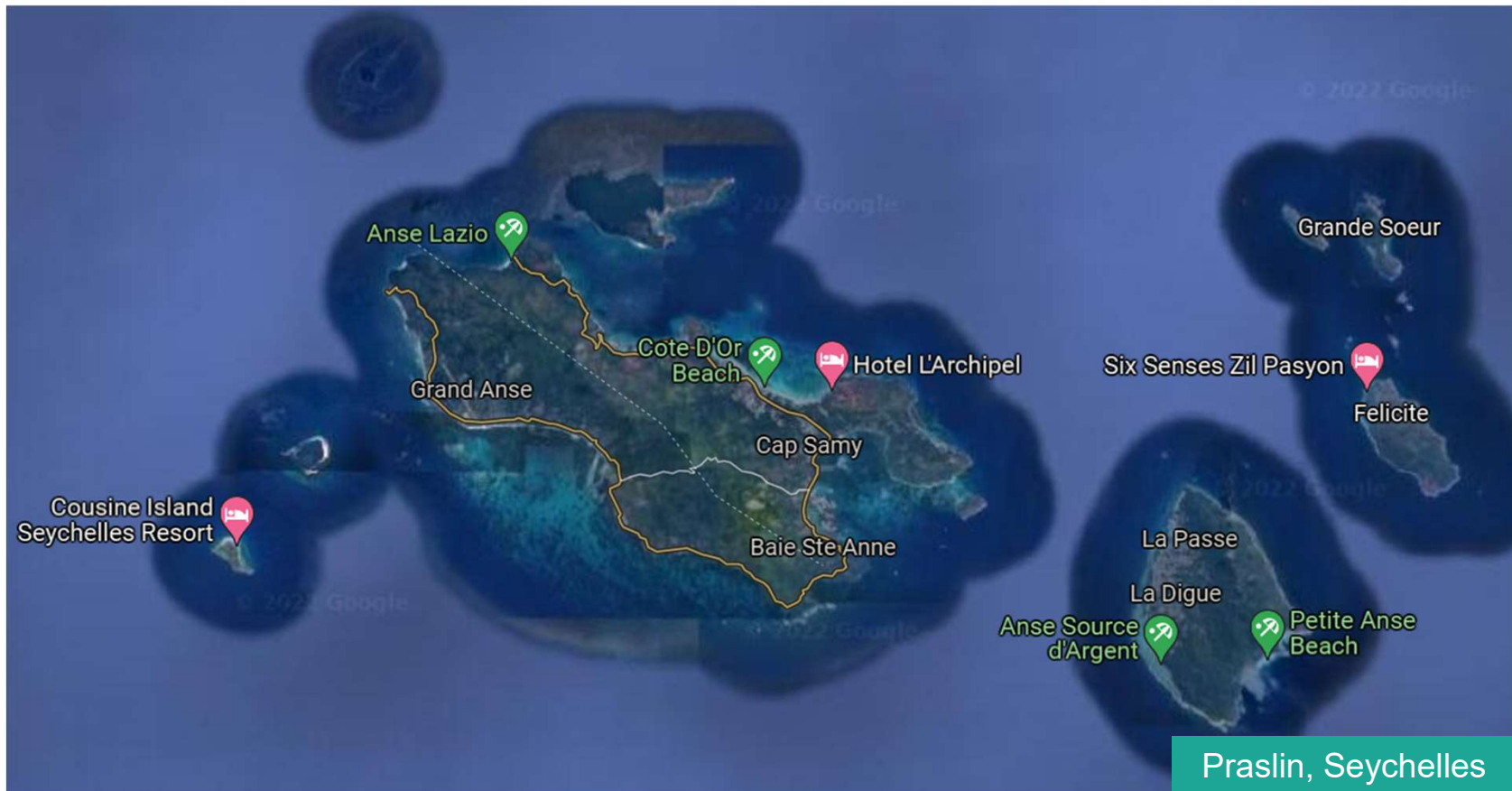
HOW THE SOFTWARE WORKS

MACCAFERRI



HOW THE SOFTWARE WORKS

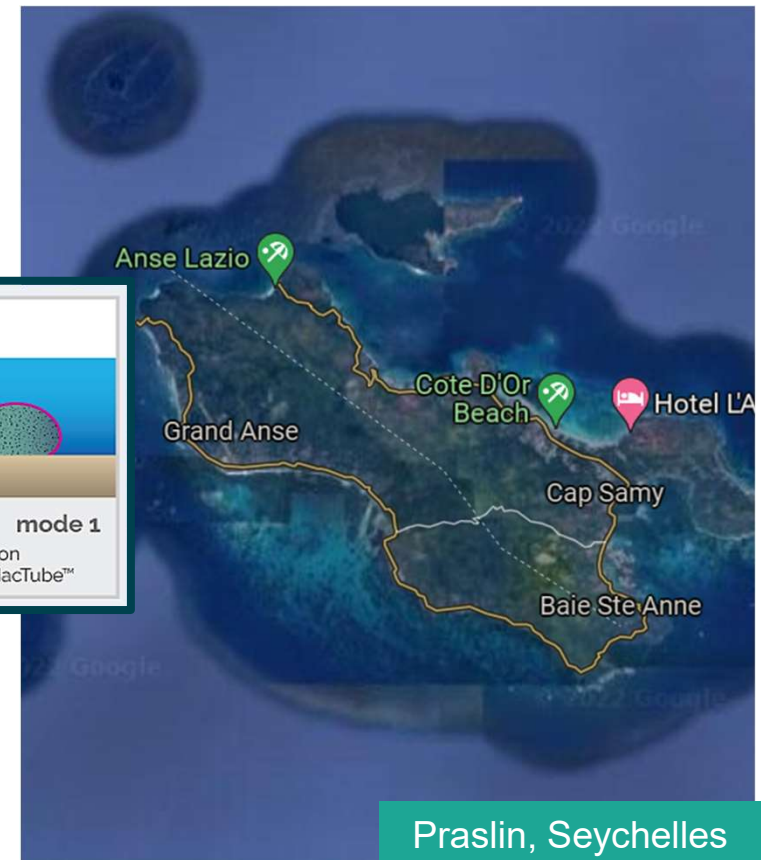
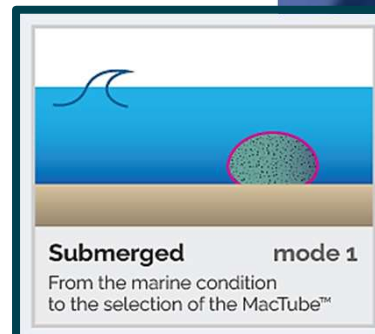
MACCAFERRI



HOW THE SOFTWARE WORKS

MACCAFERRI

CASE STUDY 1		
Marine conditions		
Seabed gradient	1	deg
Length of intervention	250	m
Wave height	4.5	m
Wave peak-period	Automatically computed by the software	
Deep water wave length		
Breaker parameter		
MacTube®		
Friction coefficient	0.5	-
Filling material unit weight	1700	kg/m³



MACCAFERRI

VERSION 1.0

Home Contact Us Dashboard Applications Companies

 Pietro Pezzano ▼

Mac S-Design



MacTube Design



REQUALIFE



Selected MacTube™

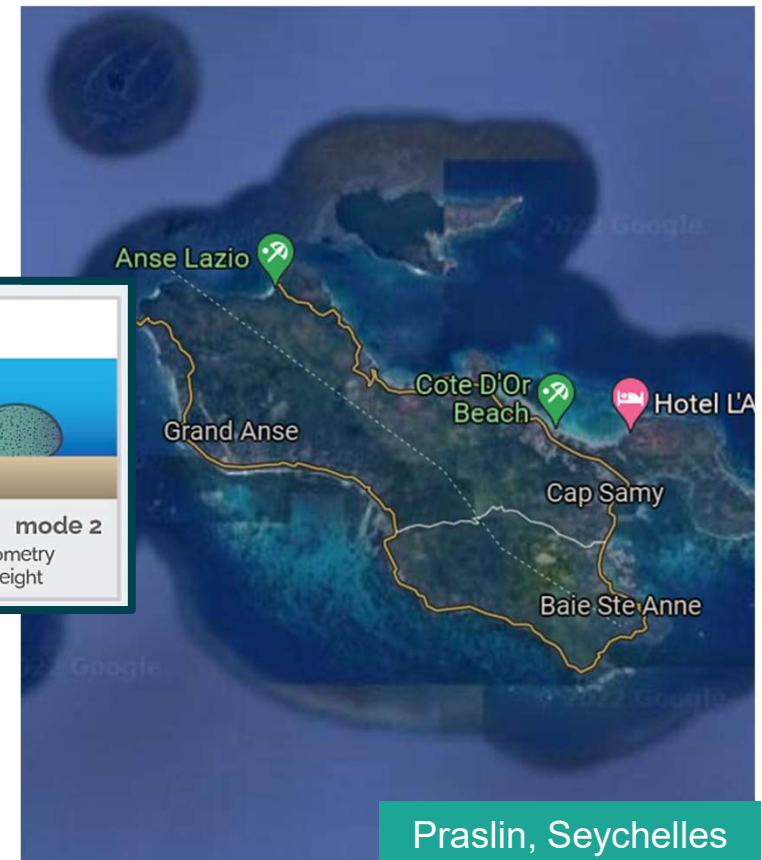
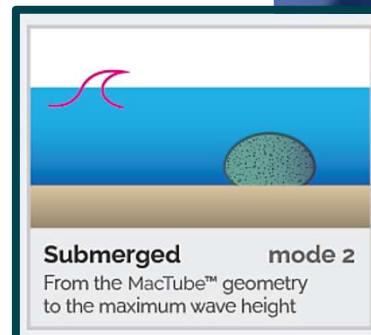
MacTube™ Code	Area [m²/m]	H [m]	W [m]	B [m]	SF -	Weight [ton]	Volume [m³]
09S.25	19	2.5	9	7.5	1	8075	4750

MacTube® 09S.25		
Geotextile tube theoretical circumference	15,45	m
MacTube® circumference	17,2	m
Length of intervention	250	m
MacTube® length	25	m
# of MacTubes	10	

HOW THE SOFTWARE WORKS

MACCAFERRI

CASE STUDY 2		
Marine conditions		
Seabed gradient	0.5	deg
Length of intervention	200	m
MacTube®		
Minimum filling height	1.5	m
Maximum filling height	4	m
Maximum allowable width	6	m
Filling material unit weight	1700	kg/m ³
Design Safety Factor	1	



Project Info

Design Condition

Input

Results

Input the relevant details of the Project

Next

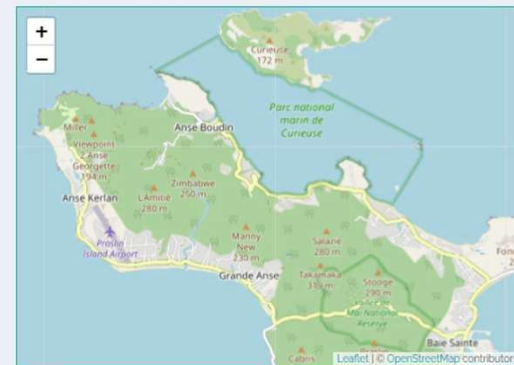
New Calculation

▼ Project details

Company *	
Project Name *	
Project No. *	
Location *	

Project notes

Location of the project *
Drag to move the map and click to select the location



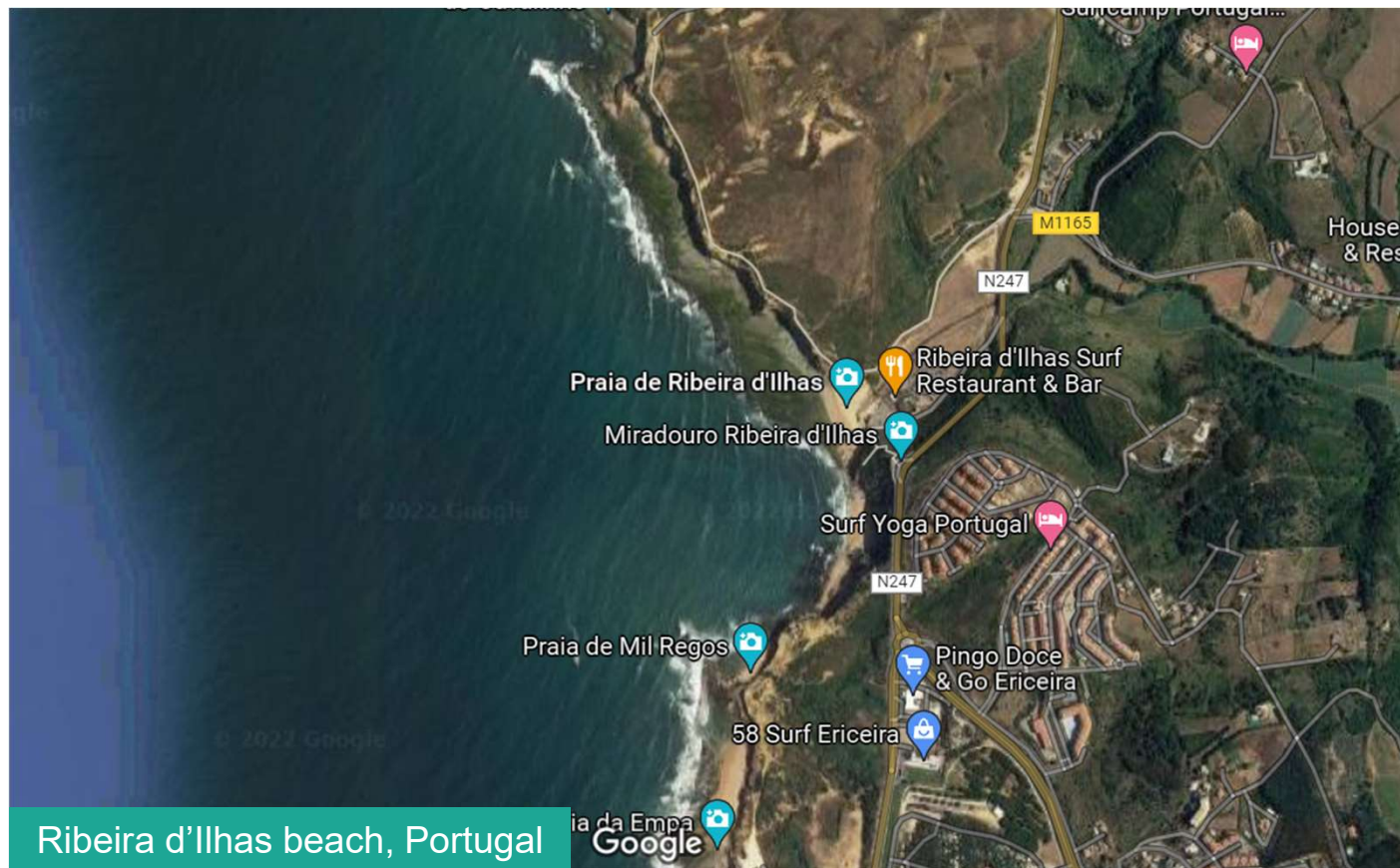
Selected MacTube™

MacTube™ Code	Area [m²/m]	H [m]	W [m]	B [m]	Hs max [m]	Weight [ton]	Volume [m³]
75S.55	8.8	1.9	5.5	4.3	2.4	2992	1760

MacTube® 09S.25		
Geotextile tube theoretical circumference	10,52	m
MacTube® circumference	10,8	m
Length of intervention	200	m
MacTube® length	20	m
# of MacTubes	10	

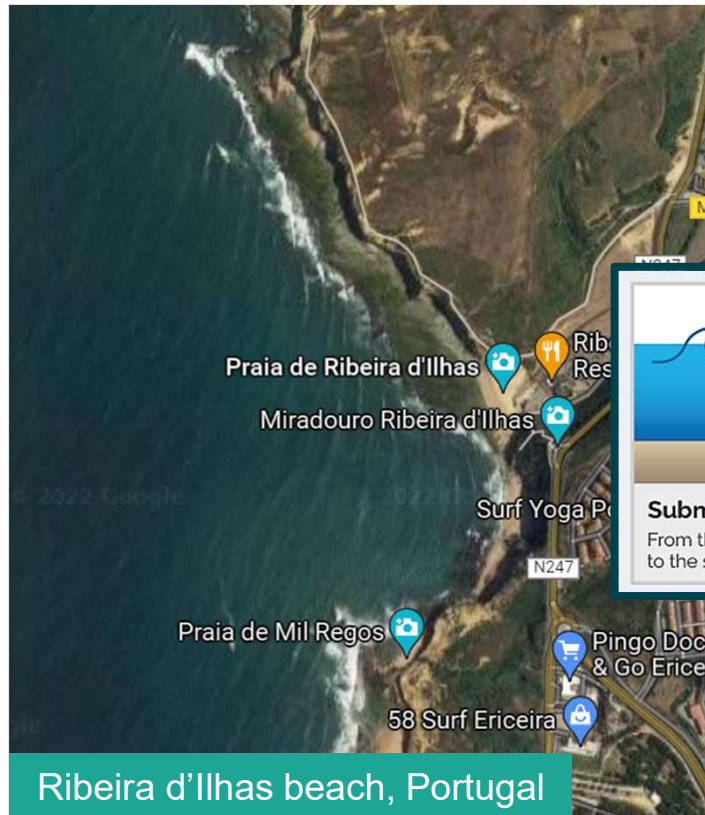
HOW THE SOFTWARE WORKS

MACCAFERRI



HOW THE SOFTWARE WORKS

MACCAFERRI



CASE STUDY 3

Marine conditions

Seabed gradient	1.7	deg
Length of intervention	300	m
Water depth at the wave breaking point	3.5	m
Wave peak-period	16.5	m
Wave height above sea level	Automatically computed by the software	
Wave height at the breaking point		

MacTube®

Filling material unit weight	1900	kg/m ³
Friction coefficient	0.5	-

Project Info

Design Condition

Input

Results

Input the relevant details of the Project

[Next](#)

[New Calculation](#)

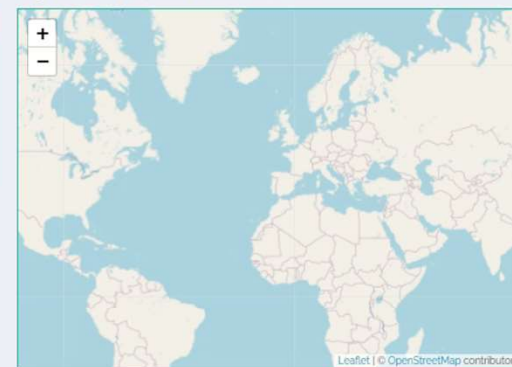
Project details

Company *	
Project Name *	
Project No. *	
Location *	

Project notes

Location of the project *

Drag to move the map and click to select the location



Selected MacTube™

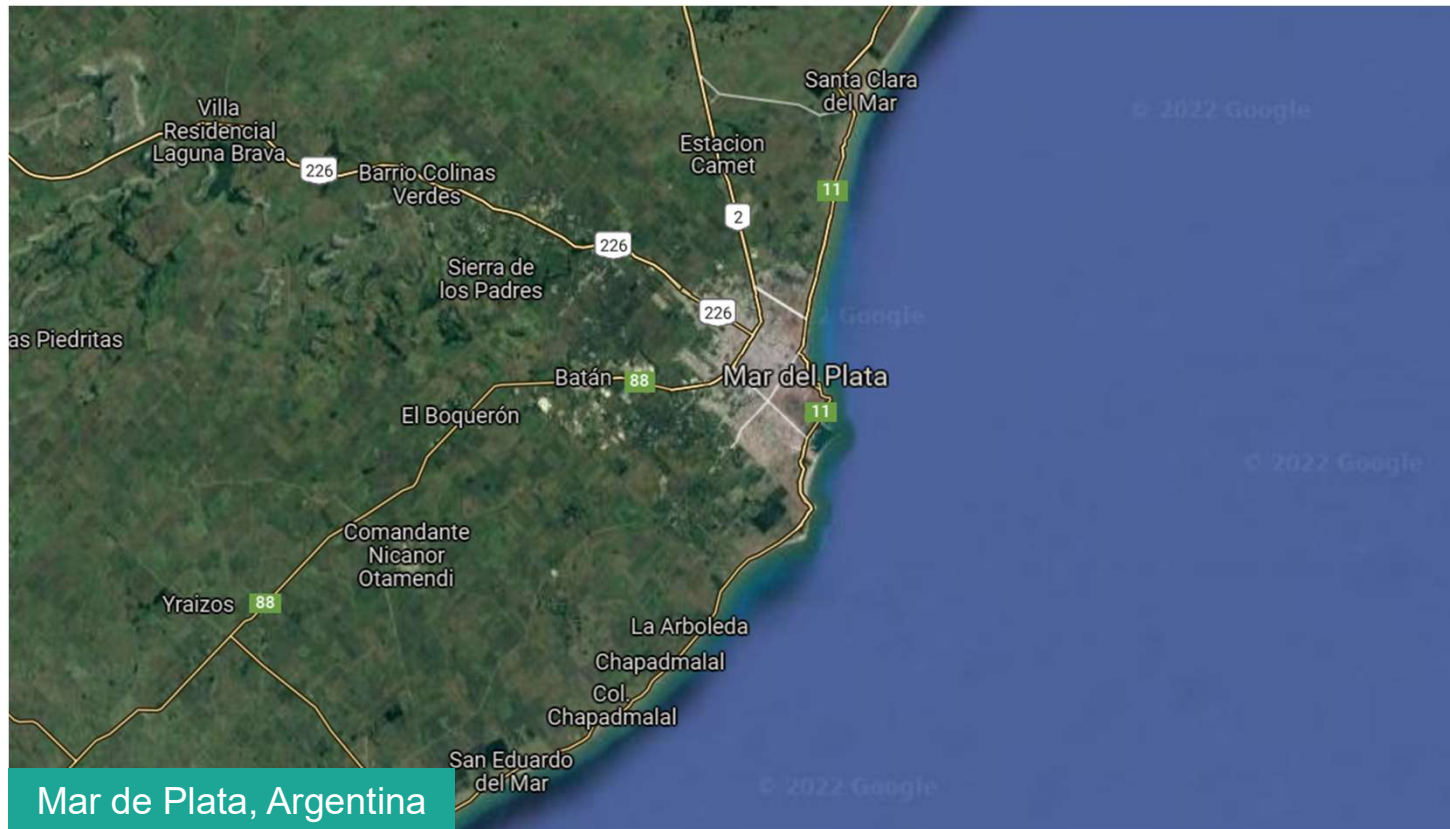
MacTube™ Code	Area [m ² /m]	H [m]	W [m]	B [m]	SF -	Weight [ton]	Volume [m ³]
17S.16	22	3	8.5	6.8	1.06	12540	6600

MacTube® 17S.16

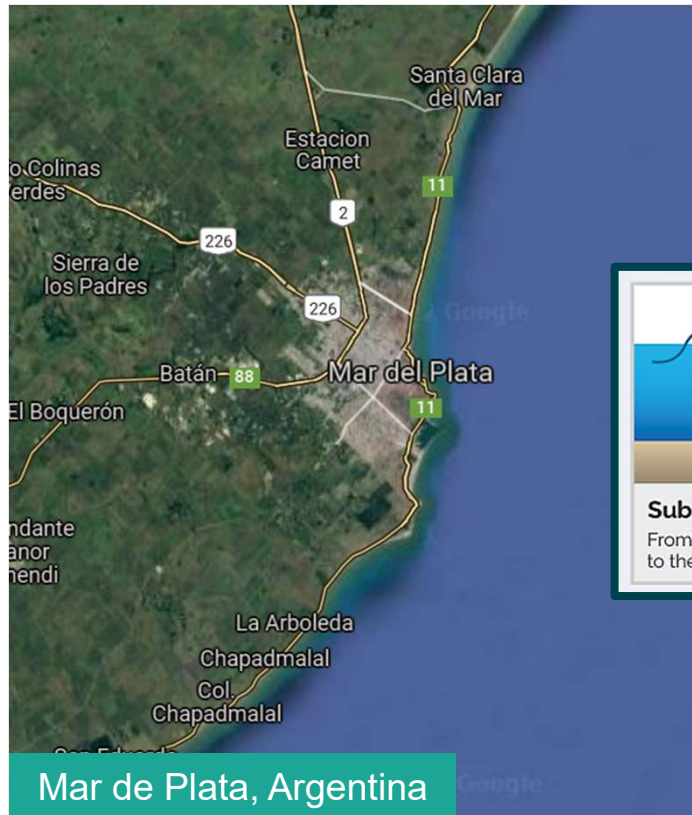
Geotextile tube theoretical circumference	16,63	m
MacTube® circumference	17,2	m
Length of intervention	300	m
MacTube® length	30	m
# of MacTubes	10	

HOW THE SOFTWARE WORKS

MACCAFERRI



HOW THE SOFTWARE WORKS



CASE STUDY 4

Marine conditions

Seabed gradient	0.5	deg
Length of intervention	200	m
Water depth at the wave breaking point	5	m
Wave height above sea level	Automatically computed by the software	
Wave height at the breaking point		

MacTube®

Filling material unit weight	1800	kg/m ³
Friction coefficient	0.5	-

Mac S-Design



MacTube Design



REQUALIFE



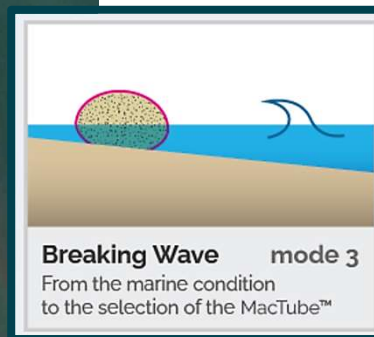
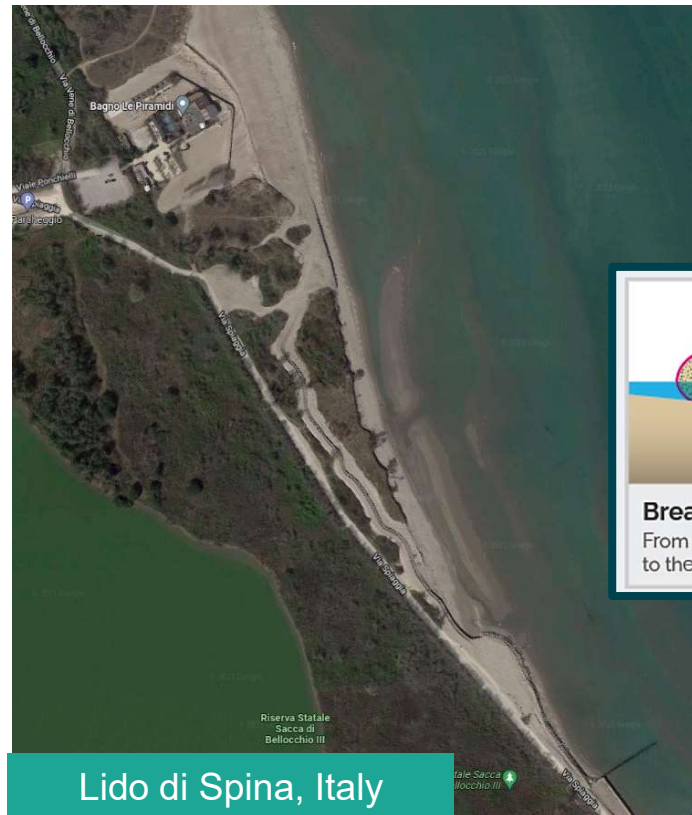
Selected MacTube™

MacTube™ Code	Area [m²/m]	H [m]	W [m]	B [m]	SF -	Weight [ton]	Volume [m³]
20S.19	33	3.3	11.5	9.6	1.03	11880	6600

MacTube® 20S.19		
Geotextile tube theoretical circumference	20,36	m
MacTube® circumference	21,6	m
Length of intervention	200	m
MacTube® length	20	m
# of MacTubes	10	

HOW THE SOFTWARE WORKS

MACCAFERRI



CASE STUDY 5

Marine conditions

Seabed gradient	0.5	deg
Length of intervention	200	m
Water depth at the wave breaking point	1.5	m
Wave height above sea level	Automatically computed by the software	
Wave height at the breaking point		

MacTube®

Filling material unit weight	1750	kg/m ³
------------------------------	------	-------------------

Project Info

Design Condition

Input

Results

Input the relevant details of the Project

Next

New Calculation

Project details

Company *	
Project Name *	
Project No. *	
Location *	

Project notes

Location of the project *

Drag to move the map and click to select the location



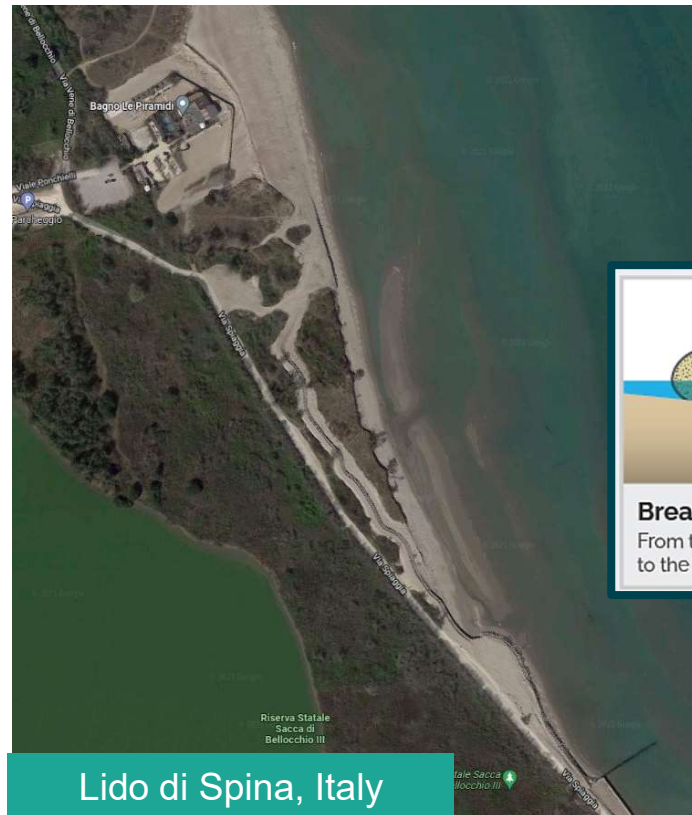
Selected MacTube™

MacTube™ Code	Area [m²/m]	H [m]	W [m]	B [m]	Weight [ton]	Volume [m³]
09S.25	7.5	2	4.5	3.1	2625	1500

MacTube® 09S.25		
Geotextile tube theoretical circumference	9,71	m
MacTube® circumference	10,8	m
Length of intervention	200	m
MacTube® length	25	m
# of MacTubes	8	

HOW THE SOFTWARE WORKS

MACCAFERRI



CASE STUDY 6

Marine conditions

Seabed gradient	0.5	deg
Length of intervention	200	m

MacTube®

Minimum filling height	1.5	m
Maximum filling height	4	m
Maximum allowable width	6	m
Filling material unit weight	1700	kg/m ³

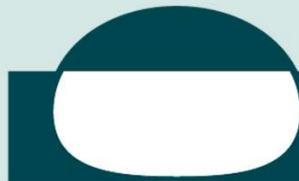
Selected MacTube™

MacTube™ Code	Area [m ² /m]	H [m]	W [m]	B [m]	hb max [m]	Hb max [m]	Weight [ton]	Volume [m ³]
09S.25	5.5	1.8	4	2.5	0.68	0.87	1870	1100

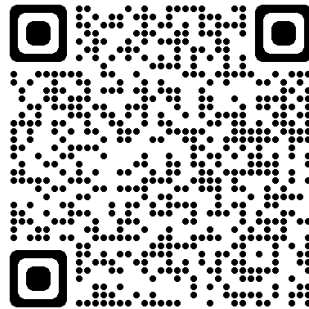
MacTube® 09S.25		
Geotextile tube theoretical circumference	8,31	m
MacTube® circumference	8,6	m
Length of intervention	200	m
MacTube® length	25	m
# of MacTubes	8	

MACCAFERRI

MacTube Design



PROTECT YOUR COAST



LIVE Q&A

MACCAFERRI

