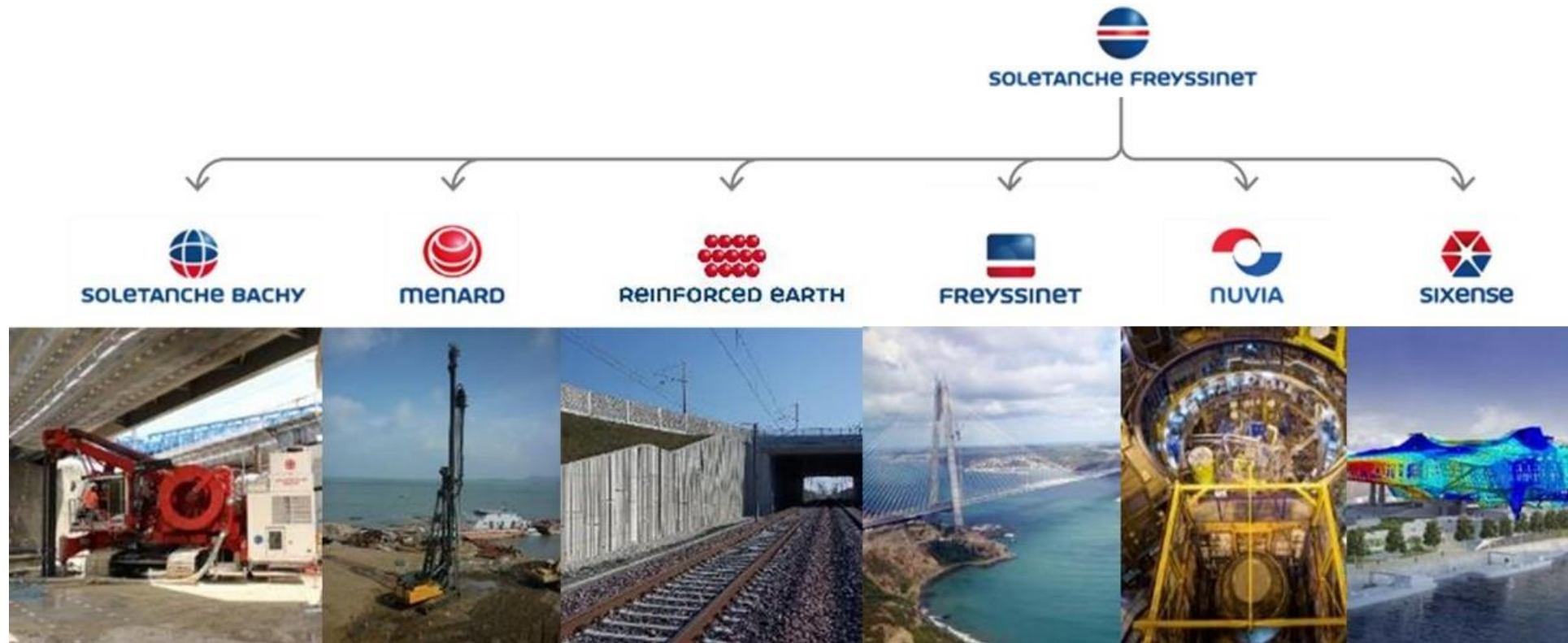


ReinFORCED eARTH
SUSTAINABLE TECHNOLOGY

Product Portfolio



Part of Soletanche Freyssinet. Worldwide leader in specialised civil engineering



A sustainable
future.
For all your
engineered soil
solutions

Alternative Reinforced Earth® Solutions
Over 60million m² installed



Mixed Abutments
Spans over 40m



Pure Abutments
Spans over 40m



Shored Walls
Heights over 50m



Wire Faced | Mineral or Green
Heights over 50m

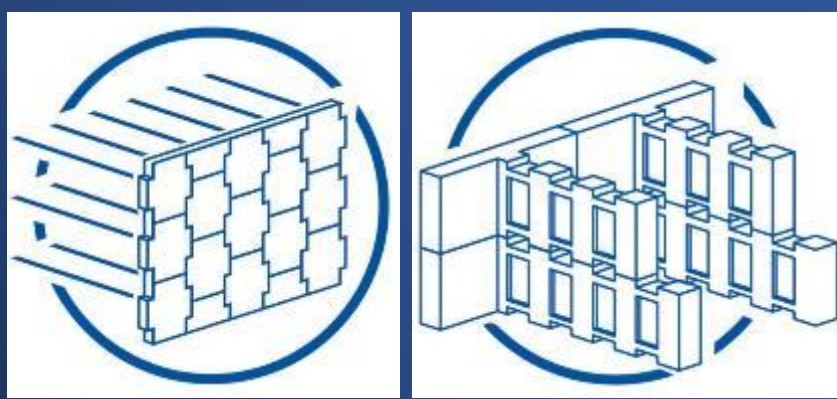


Green precast
Noise and GHG Absorber



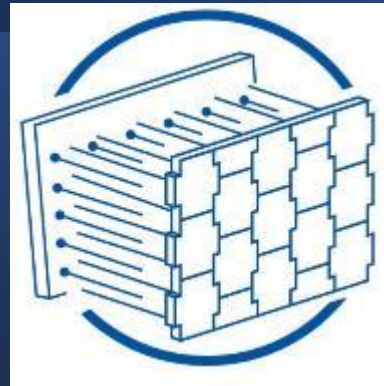
Steep Slopes
>60° to 40m heights

Low Carbon Solutions

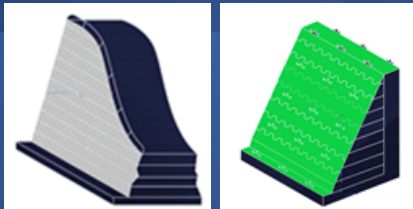


Reinforced Earth®

T-Wall®



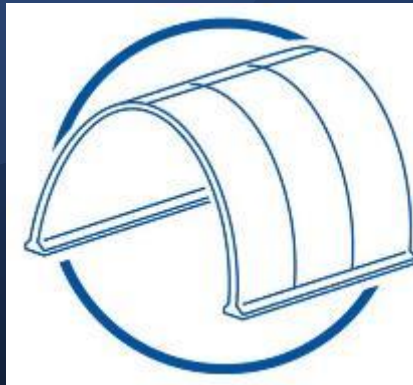
TerraLink™



ArmaStone or
ArmaGreen
Wire mesh faced

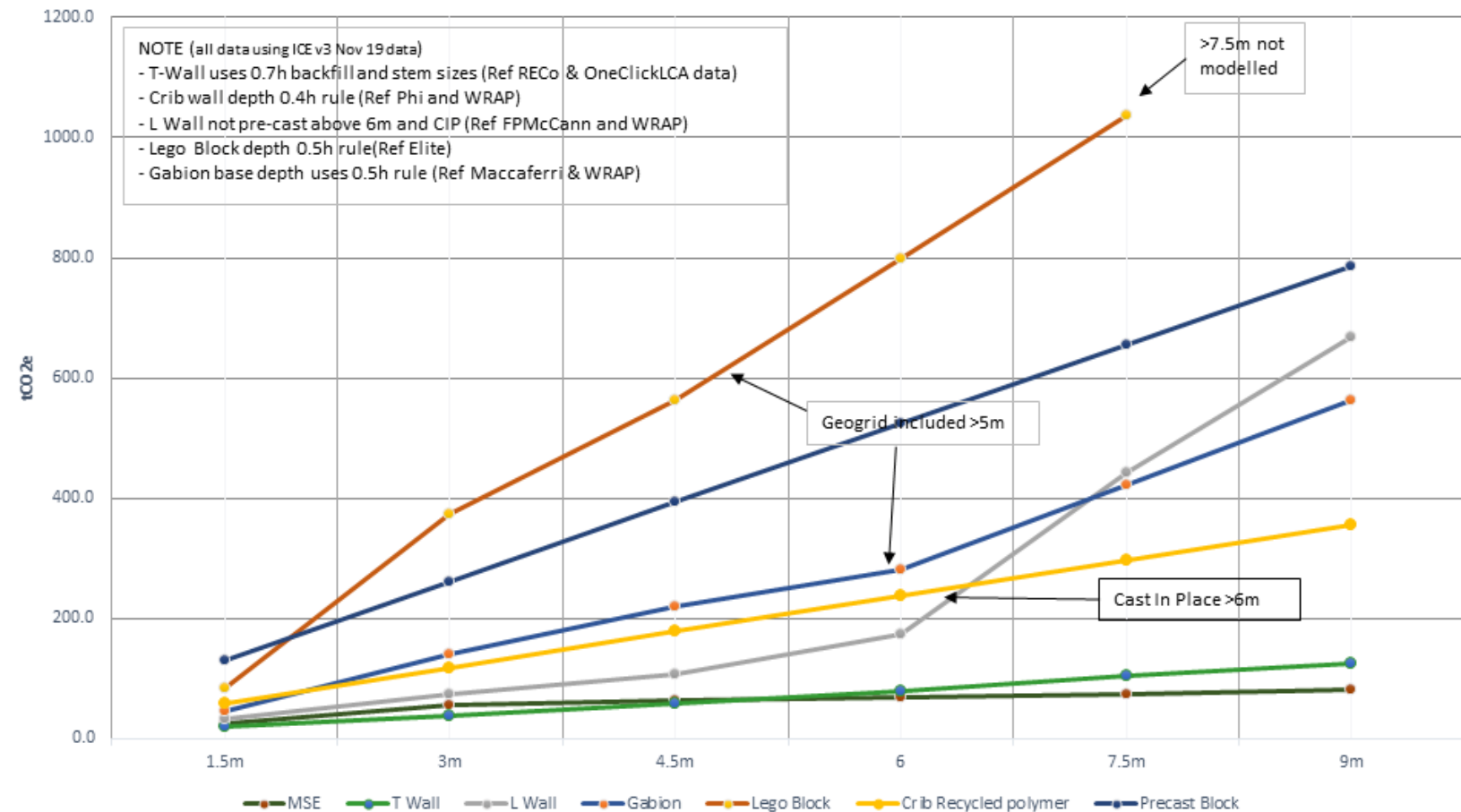


TechWall®



EcoDuct®

tCO₂e comparison for 100m length retaining wall at various heights
Manufacture, Supply & Install (all materials)
(Max surcharge on granular fill 10kN/m², all aggregates imported)



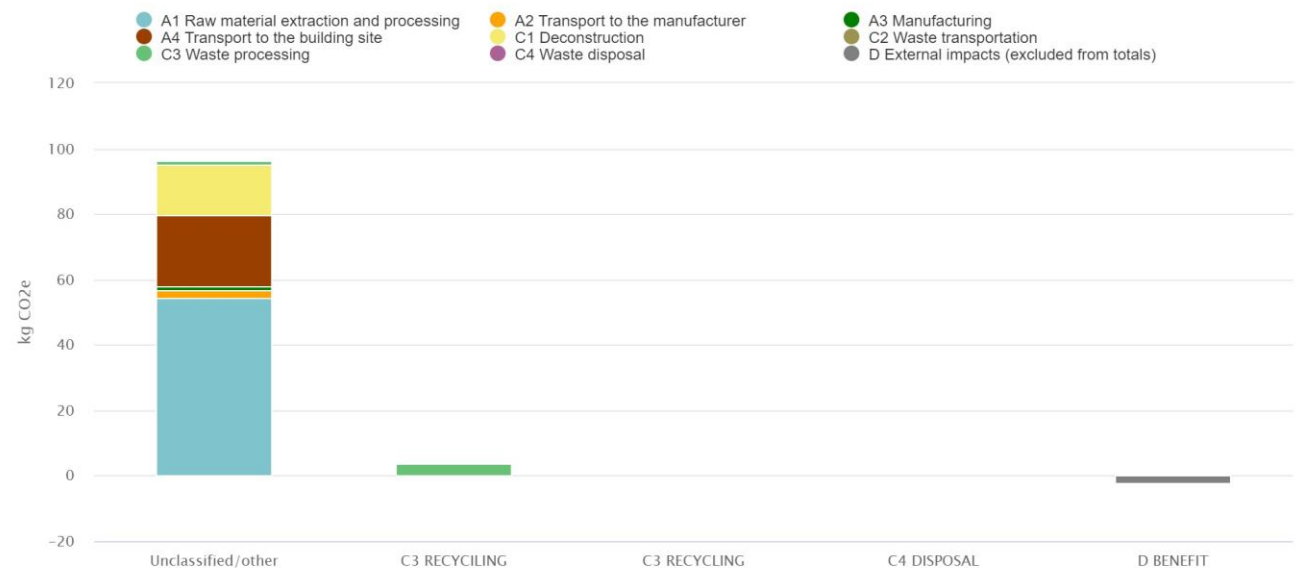
Reinforced Earth®
140mm precast
panels +
geosynthetics.
Any surface
aesthetic.
BBA/HAPAS
Certified



Reinforced Earth®



Global warming (GWP) grouped by Classification breakdown



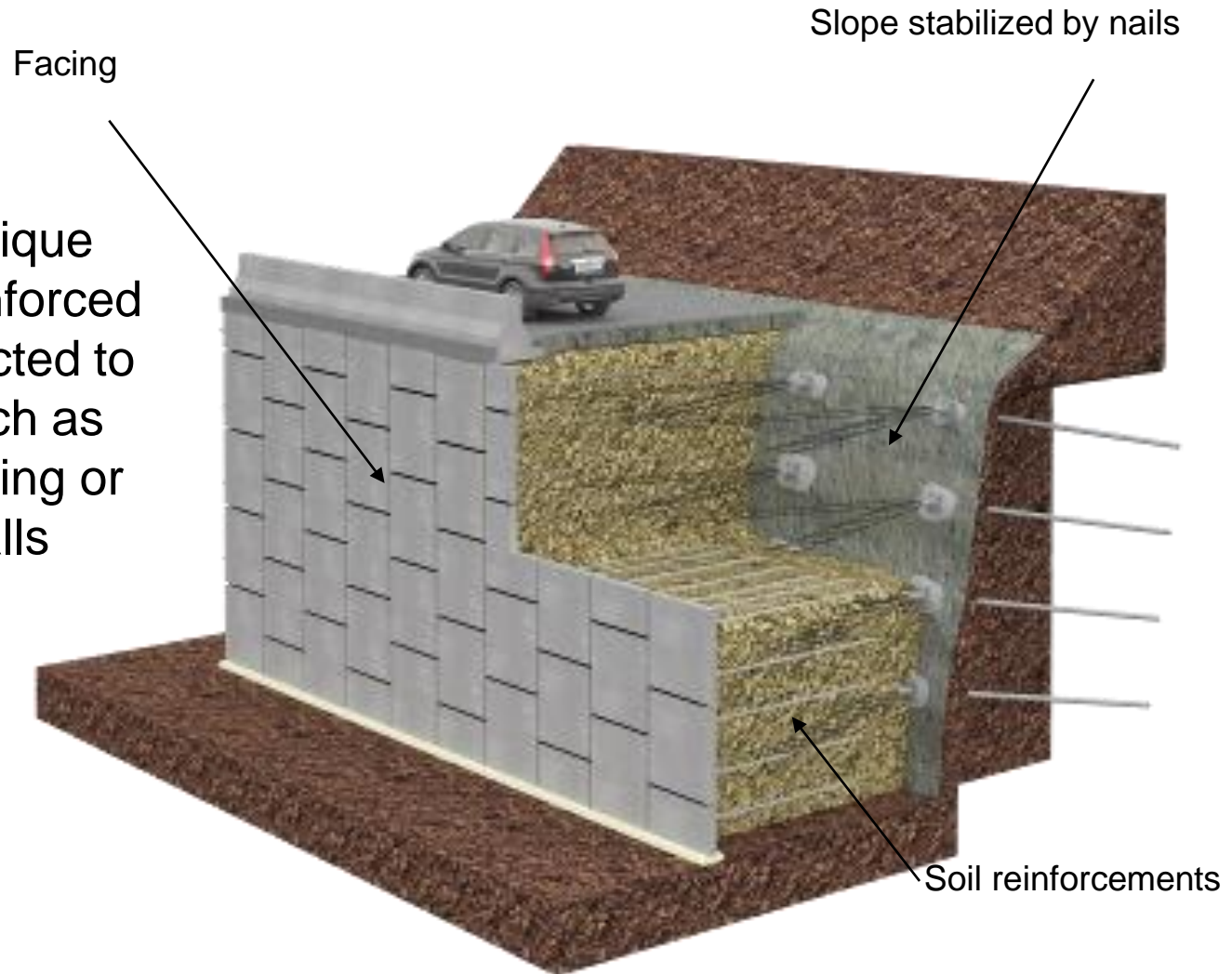


(Shored Reinforced Earth®), principle – Complementary Reinforced Application

TerraLink™

*A logical complementary
development*

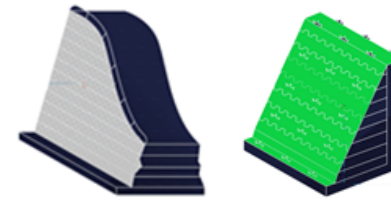
The **TerraLink™** technique allows building new Reinforced Earth® type walls connected to retaining structures such as slopes stabilized by nailing or existing retaining walls



Unlimited Aesthetics



ArmaGreen or ArmaStone



Steel mesh facing



ArmaStone
mineral facing



ArmaGreen
vegetated facing

Reinforcements



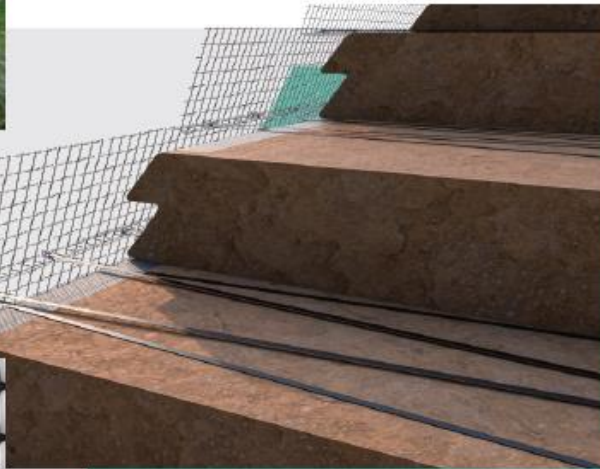
Steel
reinforcement



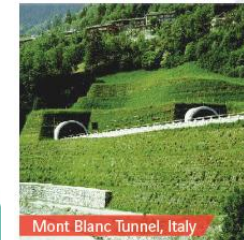
Geostrip
reinforcement



Geogrid
reinforcement



Steel mesh facing with geostrip



Mont Blanc Tunnel, Italy



Saint V ran, France



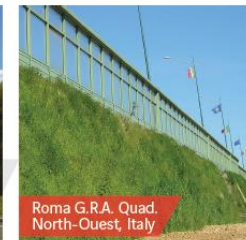
Vegetated steep slope, Japan



Z-Morh tunnel, India



Parc de la Courneuve, France

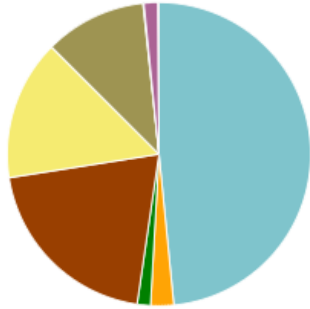


Roma G.R.A. Quad.
North-Ouest, Italy



A4 H rselgau, Germany

Global warming kg CO₂e - Life-cycle stages

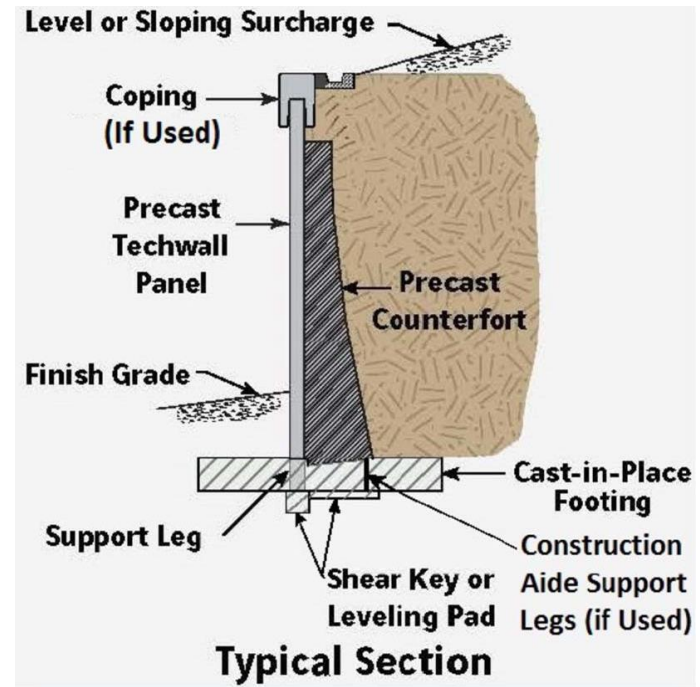


- A1 Raw material extraction and proc...
- A2 Transport to the manufacturer - 2....
- A3 Manufacturing - 1.4%
- A4 Transport to the building site - 20....
- A5 Installation into the building - 15.0%
- C1 Deconstruction - 10.8%
- C2 Waste transportation - 0.1%
- C3 Waste processing - 1.5%
- C4 Waste disposal - 0.1%



TechWall®

TechWall Counterfort precast panels
Up to 18m tall x 2.5m wide, 140mm thick



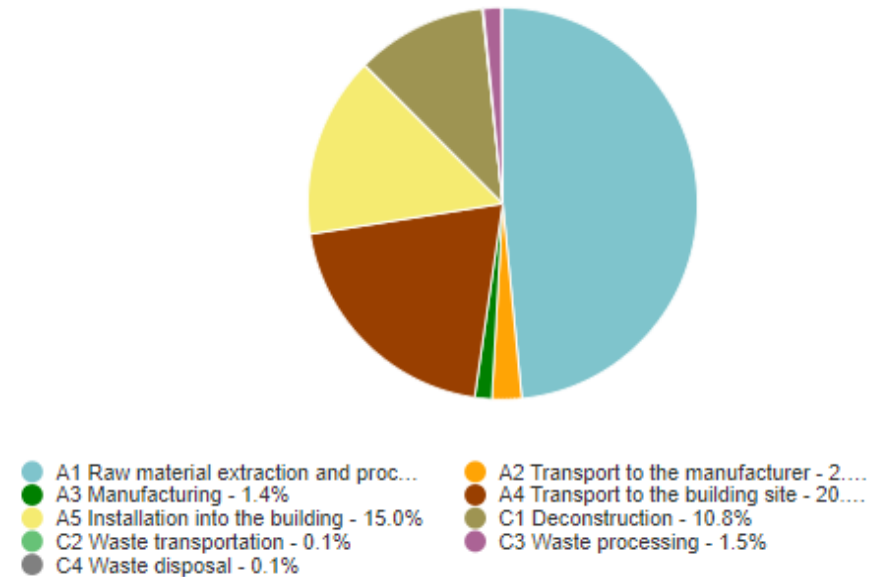
T-Wall Modular
Stackable Panels
for retaining
walls, abutments.
140mm thick
Any surface
aesthetic



T-Wall®



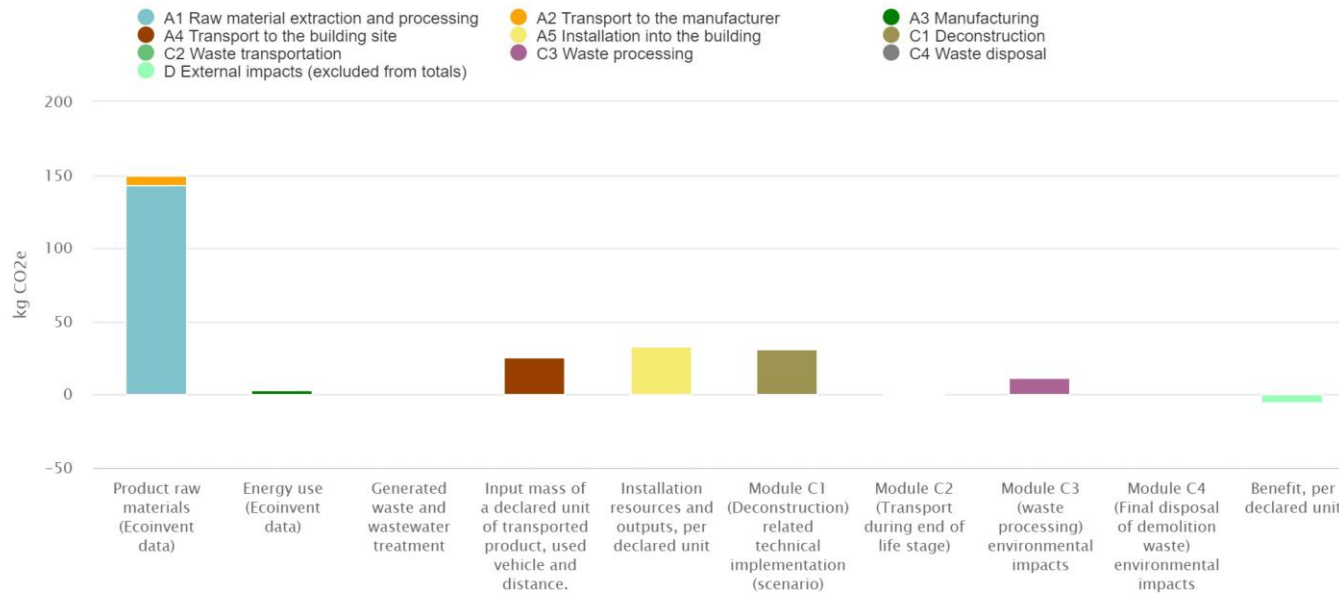
Global warming kg CO₂e - Life-cycle stages







Global warming (GWP) grouped by Classification breakdown



EcoDucts
Arch
Thickness
200-450mm.
Spans to 30m



EcoDuct®



Noise Barriers Structural and noise absorbing





Hybrid Mineral green faced



ReGrid - UX_{PET}

ReGrid - UX_{PET} is a knitted polyester Geogrid manufactured into a dimensionally stable network of apertures providing tensile reinforcement capacity in one direction. ReGrid - UX_{PET} is best suited for demanding soil reinforcement applications.

Applications

- **Steep Slopes:** Used as soil reinforcement for reinforced soil steep slopes and embankments.
- **Basal Reinforcement:** ReGrid - UX_{PET} improves the stability of soft sub-soils by interacting with engineered fill and providing a strong mattress foundation for embankments and platforms.
- **Foundation Improvement:** ReGrid - UX_{PET} is used to support shallow structural foundations, by improving stability, enhancing load distribution and reducing differential settlement.

Technical Parameters

Properties	Test Method	Units	RG-UX _{PET} 40	RG-UX _{PET} 60	RG-UX _{PET} 80	RG-UX _{PET} 100	RG-UX _{PET} 120	RG-UX _{PET} 150	RG-UX _{PET} 180	RG-UX _{PET} 200	RG-UX _{PET} 250	RG-UX _{PET} 300
Minimum Average Roll Value (MARV)												
Physical Properties												
Material			Polyester									
Mass Per Unit Area	ASTM D 5261	g/m ²	209	244	306	356	427	463	526	555	648	751
Mechanical Properties												
Ultimate Tensile Strength in Machine Direction	ASTM D 6637 B	kN/m	40	60	80	100	120	150	180	200	250	300
Ultimate Tensile Strength in Cross Machine Direction		kN/m	20	20	30	30	30	30	30	30	30	30
Elongation at Designated Strength (%T ₀)		%	10	10	10	10	10	10	10	11	11	11
Tensile Strength at 5% Strain (%T ₀)	ASTM D 6637 A		20	30	40	50	60	75	81	90	100	120
Creeep Reduction Factor (3.14 Years Design Life)		at 20°C at 30°C	1.39 1.44	1.39 1.44	1.39 1.44	1.39 1.44	1.39 1.44	1.39 1.44	1.39 1.44	1.39 1.44	1.39 1.44	1.39 1.44
Partial Factor - Installation Damage	ASTM D 5818	Particle size < 5mm (Dry Sand)	1.10	1.10	1.02	1.02	1.02	1.02	1.02	1.06	1.06	1.06
		Particle size < 30mm (Gravelly Sand)	1.12	1.12	1.06	1.06	1.04	1.04	1.04	1.04	1.04	1.04
		Particle size < 125mm (Sandy Gravel)	1.19	1.19	1.16	1.16	1.11	1.11	1.11	1.11	1.11	1.11
Partial Factor - Environmental Effects	GR-GGZ, GR-GGK, Environment	4 × pH < 8	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
Molecular Properties												
Molecular Weight (GR-GGZ)		g/mol	minimum 25,000									
Carbonyl End Group (GR-GGZ)		mmol/kg	maximum 30									
Standard Packaging												
Roll Dimensions (Width x Length)		m	3.8 x 100	3.8 x 100	3.8 x 100	3.8 x 100	3.8 x 100	3.8 x 100	3.8 x 100	3.8 x 100	3.8 x 100	3.8 x 100
Roll Area ^a		m ²	380	380	380	380	380	380	380	380	380	380
Weight Per Roll ^b		kg	90.5	112.9	138.4	157.8	182.1	199.2	232.6	246.7	287	315

All the values mentioned are of minimum average roll values (MARV)
* ±1.5 Variation possible
** Other roll sizes available

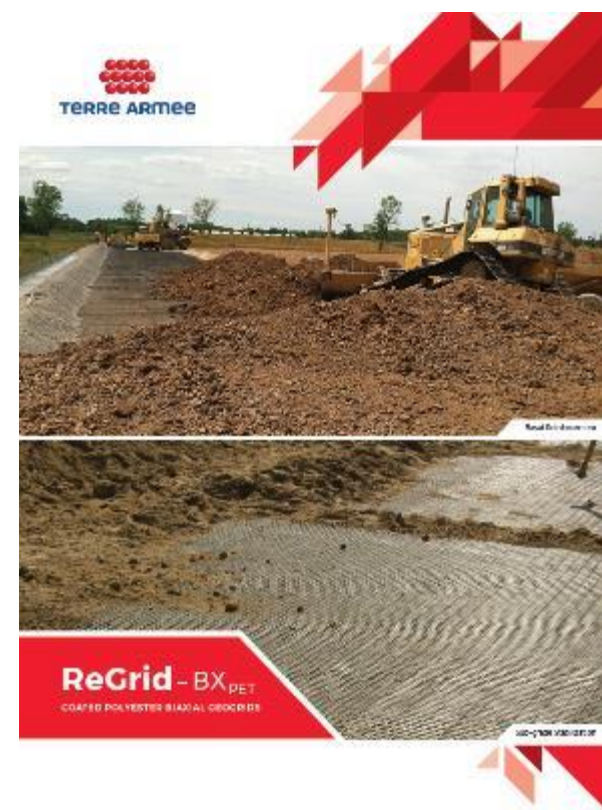
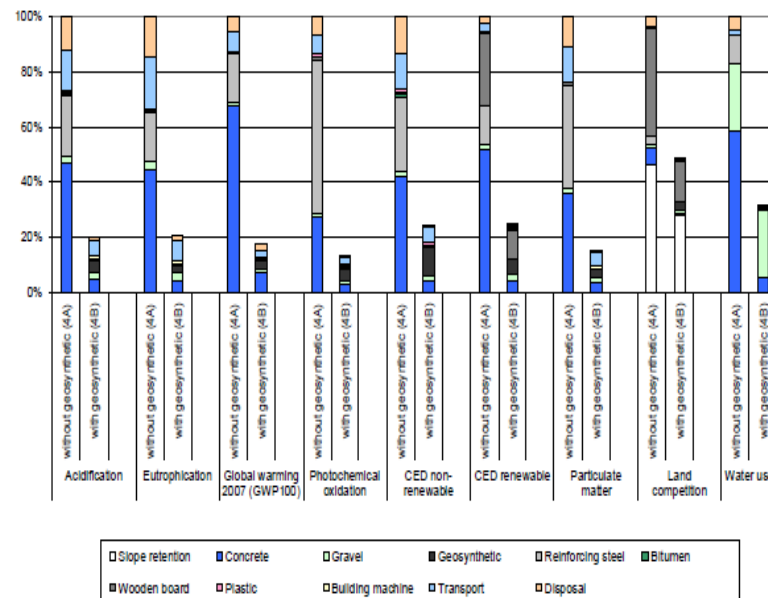
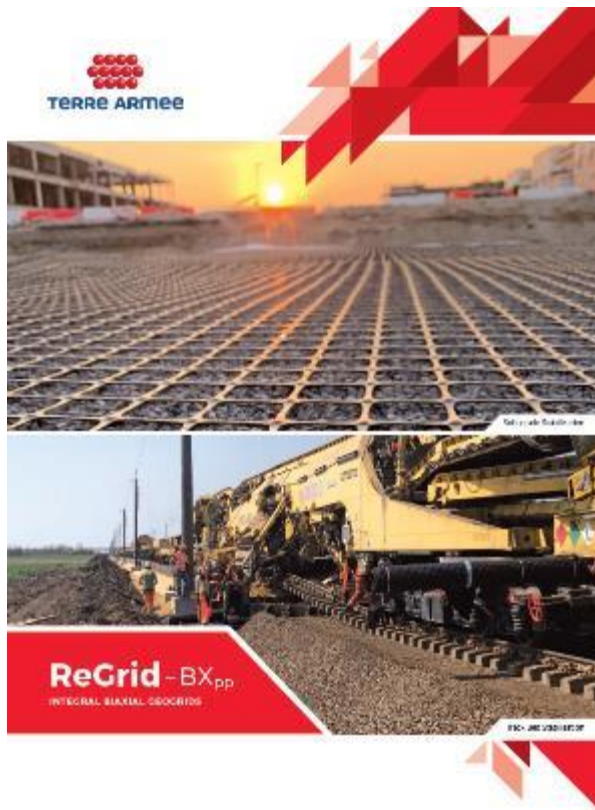
NOTES
A. All prescribed values are minimum unless otherwise mentioned and tested in GR-LAP accredited laboratories.
B. These properties may change at the time of manufacturing, handling, storage and shipping.
C. Roll weights are average values including shipping costs. Actual weight may vary.
D. Customized rolls with varying lengths of master rolls can be manufactured.
E. The above values are subject to change as per discretion of the company.

www.terre-atheos.com

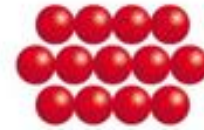
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August, 2020



Geosynthetics



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