REINFORCED EARTH
SUSTAINABLE TECHNOLOGY

Product Information

Part of Soletanche Freyssinet. Worldwide leader in specialised civil engineering

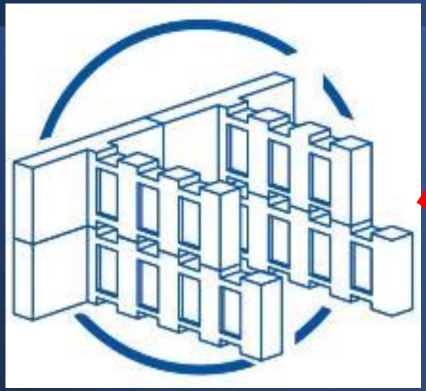
A sustainable future.
For all your engineered soil solutions

Alternative Reinforced Earth® Solutions
Over 60million m² installed

Reinforced Earth®

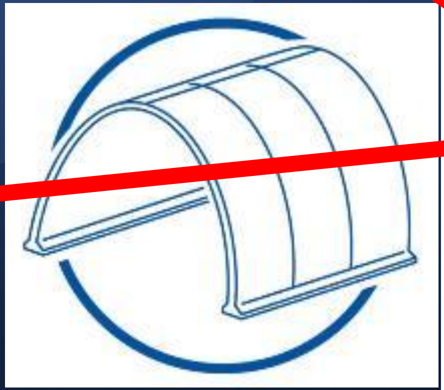
TerraLink™

Low Carbon Solutions

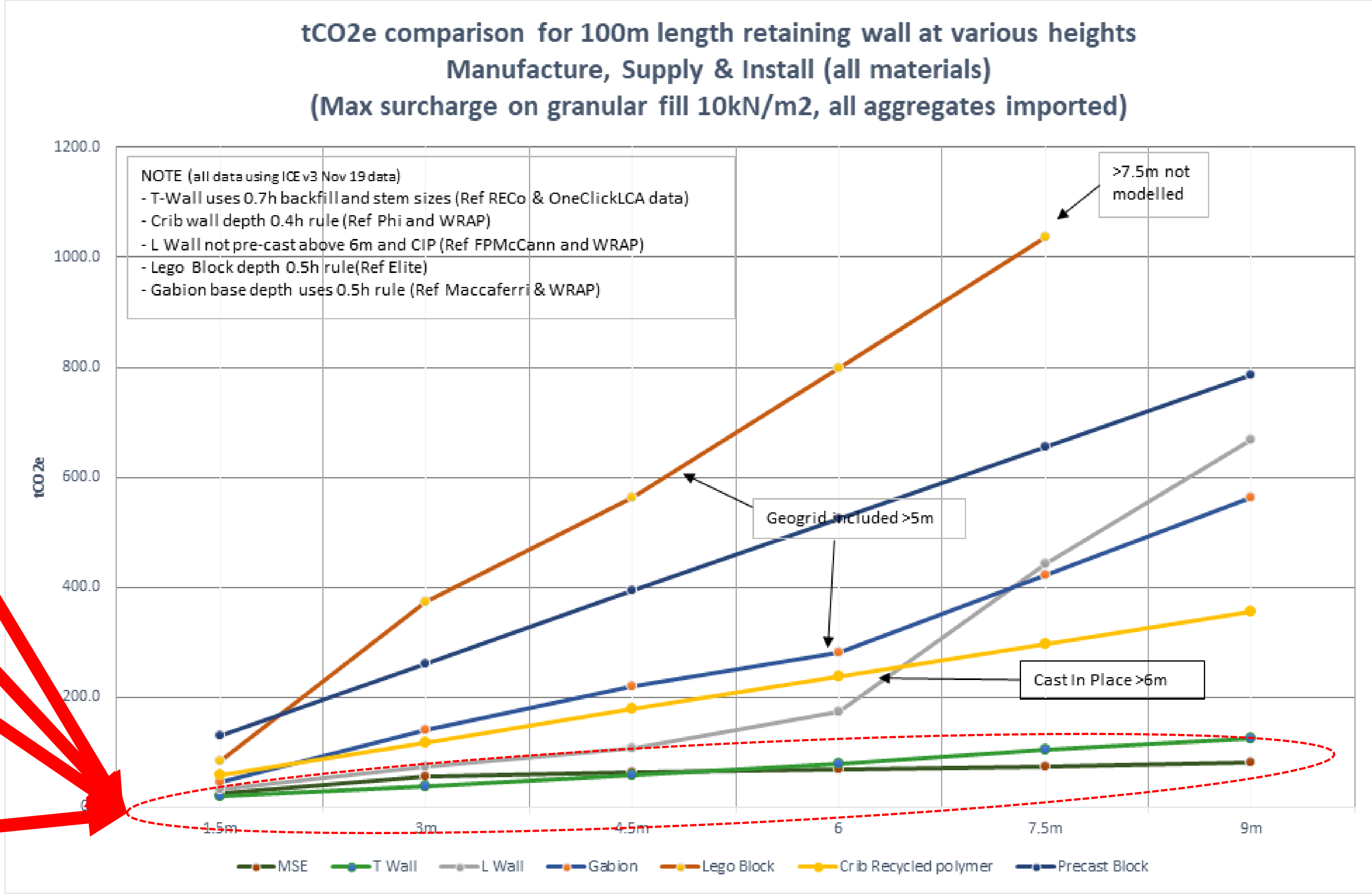


T-Wall®

TechWall®

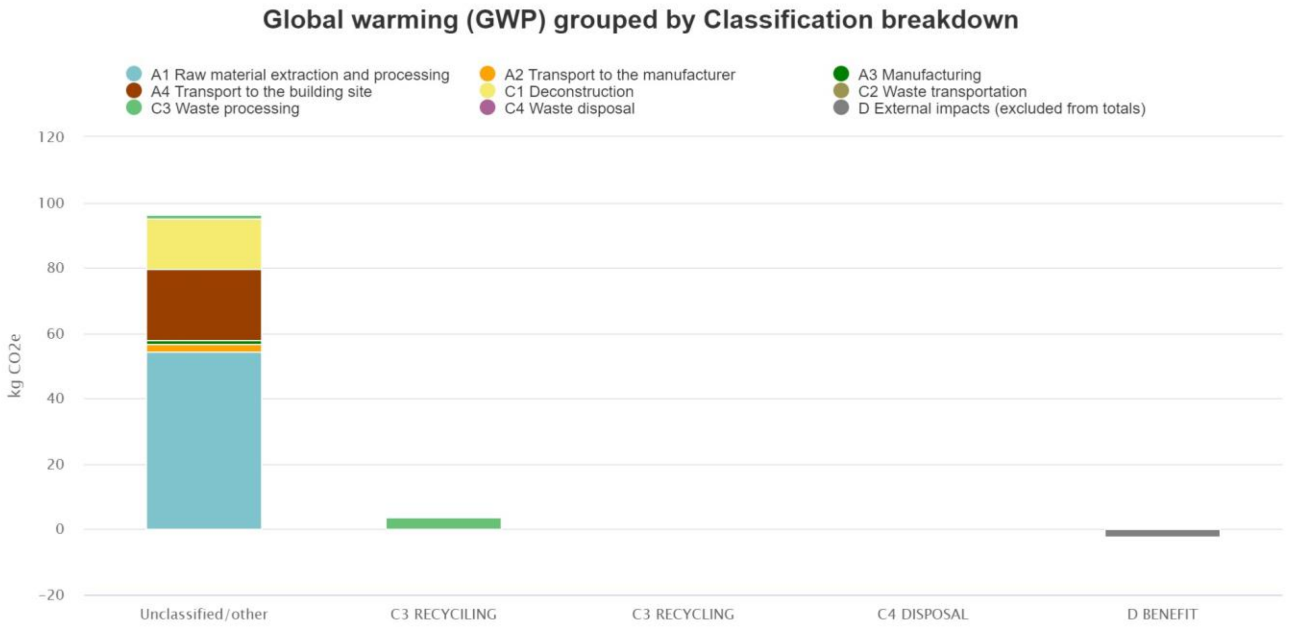


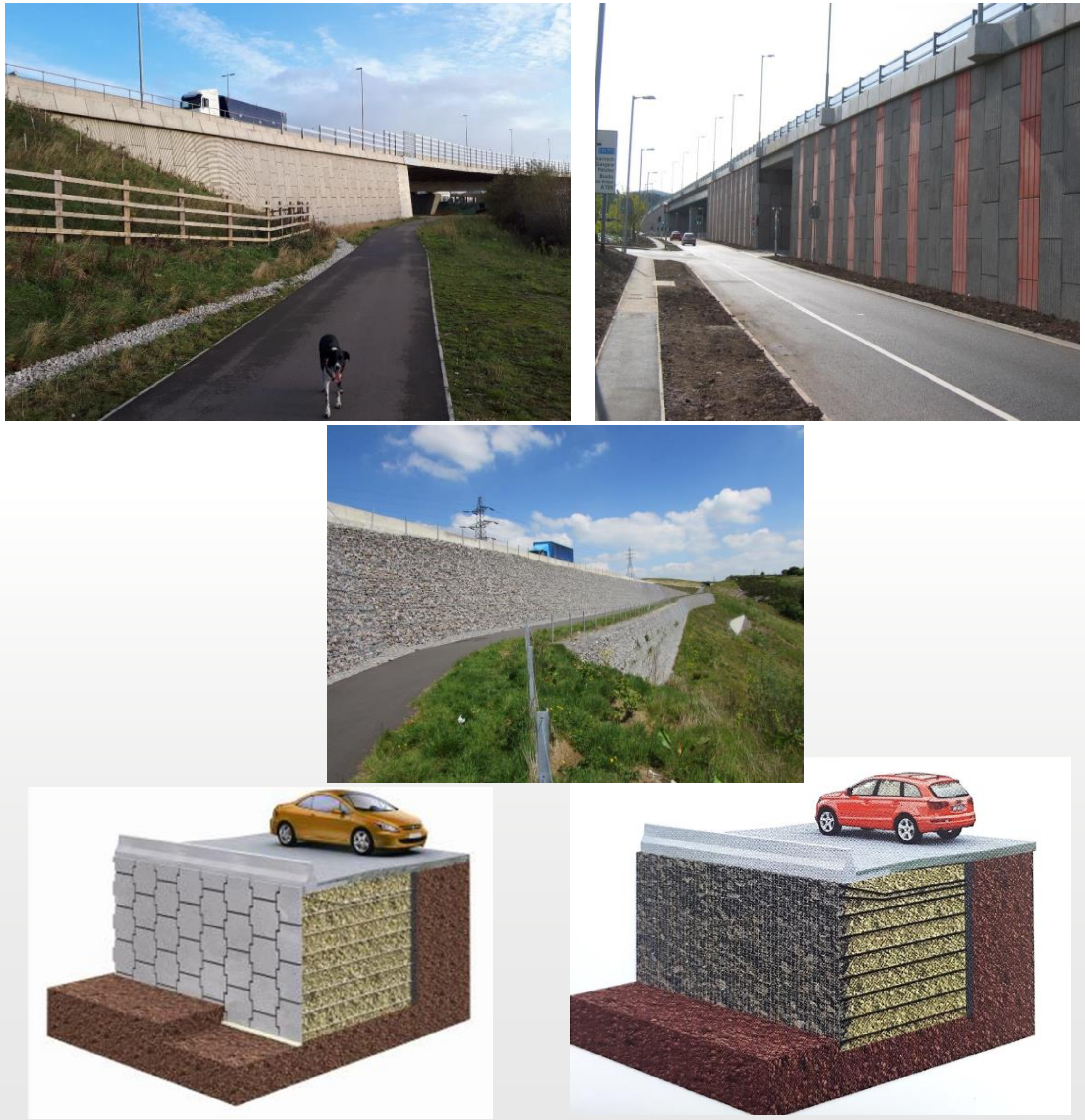
EcoDuct®



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

Reinforced Earth®





Integral Bridge Types Sustainability

Integral and semi-integral bridges

Piled Solution

Reinforced Earth Solution

Ridged need to consider piling approach

Flexible will settle with approach

Reinforced earth abutment uses 77% less embedded carbon that the piled solution not including the ease of recycling

Lower Thames Crossing exemplar

Carbon neutral construction

The Lower Thames Crossing is a Pathfinder project, meaning it will explore ways to be carbon neutral in construction.

We've already been able to reduce our carbon emissions during construction by around a third, and are working with partners and suppliers to drive it out further.

- We're the first major infrastructure project to use our procurement process to target carbon
- We'll test and scale-up innovative and low carbon materials and technology
- We'll only use zero carbon electricity sources
- We're aiming to remove diesel from our sites and only use hydrogen and electric plant
- We'll reduce and beneficially reuse our waste

Read more about plans.

Materials:

There is a specific focus on Cement, Steel, Asphalt and Concrete within the scheme.

No.		Detail
11	**Cement/Concrete**	Where cement cannot be eliminated or substituted, the lowest carbon product available will be used, in the most carbon efficient design. A min of 65% GGBS to be used [illegible] the project. *Can the supplier provide an alternative or more efficient [illegible] option?*
12	**Steel**	Reused or recycled steel will be used where possible for structural applications. Reinforced concrete will use basalt and fibre substitutes where possible *Can the supplier provide an alternative or more efficient material option?*
13	**Asphalt**	[illegible] asphalt to be used [illegible] binder courses as standard. *Can the supplier provide an alternative or more efficient material option?*
14	**Provision of Material Data**	Where possible Environmental Product Declarations (EPDs) will be [illegible] available for materials supplied. It is important that an understanding of the embodied carbon of materials is available, this could include emissions from raw materials, manufacturing, transport (A1-A3) but could include further lifecycle stages use of use and disposal.
15	**Material Delivery**	There is a strong focus within the LTC scheme to reduce road deliveries and utilise river or rail options. *Can the supplier delivery materials via road or rail methods?*
16	**Other Materials**	There is a focus on the biggest carbon material hotspots however all materials contribute to the projects footprint. *Can the supplier provide an alternative or more efficient material option?*

Yes 65%GGBS standard and soon Exegy 100% cement substitute

Yes rebar 97% recycled CARES + Basalt possible

Yes EPD's and LCA's made available

Corporate:

No.	Area	Detail
1	**All Major Suppliers will have a Net Zero by 2050 plan**	All major suppliers to have a net zero corporate target and plan, aligned to government targets of net zero by 2050.
2	**PAS2080 compliance**	All major subcontractors will be compliant with PAS2080 'Carbon management in infrastructure' within 52 weeks of appointment. Compliance allows all areas of the value chain to work collaboratively to reduce carbon
3	**Use of Local Workforce**	The project aims to boost the local economy, in addition to reducing transport related emissions. A local workforce is a key within both these areas
4	**Use of carbon credits**	The purchase of carbon credits (a tradable certificate presenting the right of a company to emit carbon) by a supplier is prohibited. *Note: This is different to carbon offsetting*
5	**Site-level data**	Use of data is key to understanding the impact of operations. Supplier data will be requested weekly/monthly on areas such as fuel use/energy, material use, transport, waste
6	**Pricing**	It is important that we all approach this scheme with low carbon in mind, however we understand that use of alternative or innovative materials/processes/technology may come at an additional cost. Within your pricing, please include and highlight your 'low carbon' options.

6.3 Q3a/b Carbon Reduction and management

6.3.1 The following benefit(s) may be achievable:

- The use of site won chalk material as opposed to imported fill reduces the amount of material imported to and exported from site, reducing carbon impact both in terms of construction and transport.

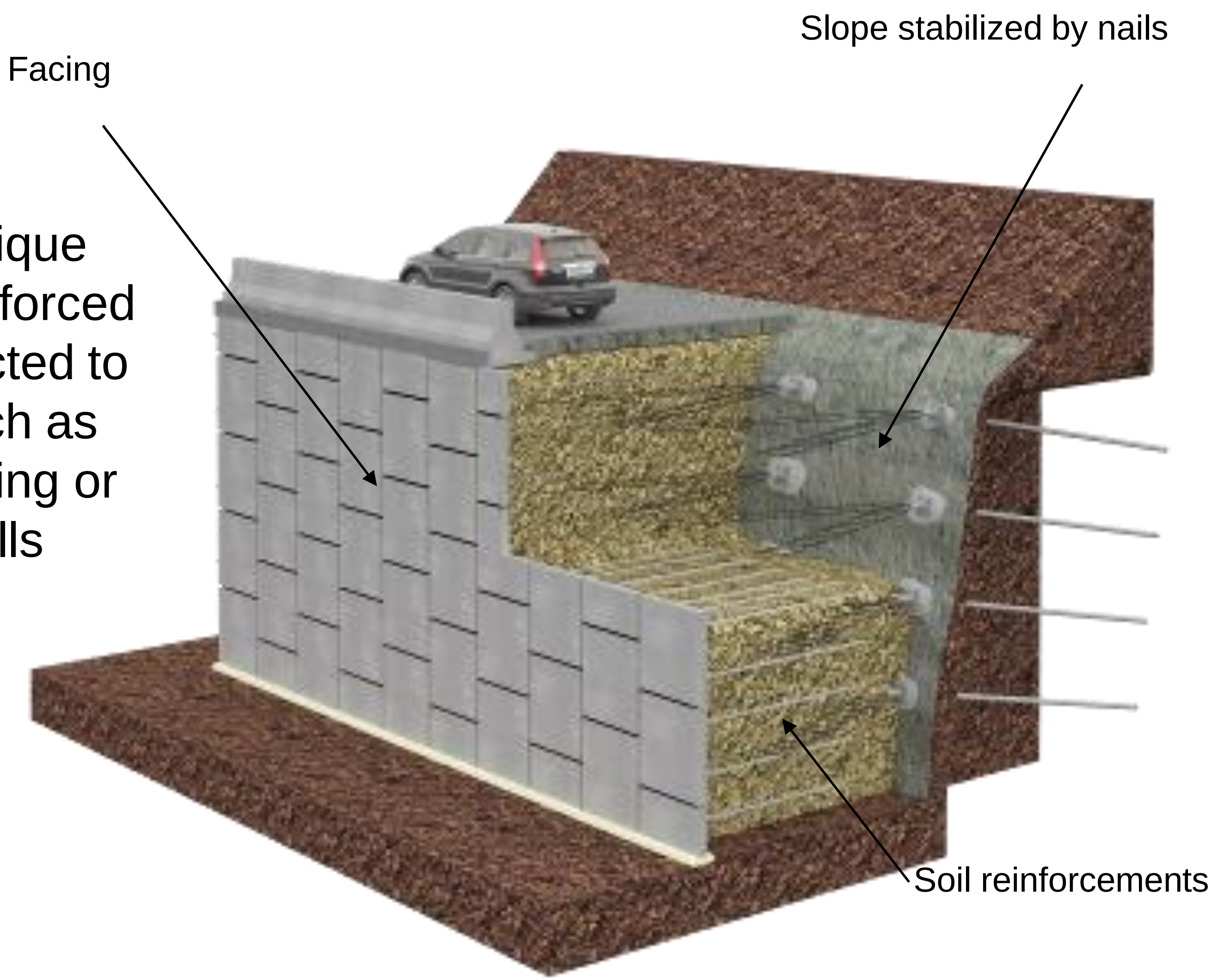
Yes – Site won and chalk can be used

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

TerraLink™

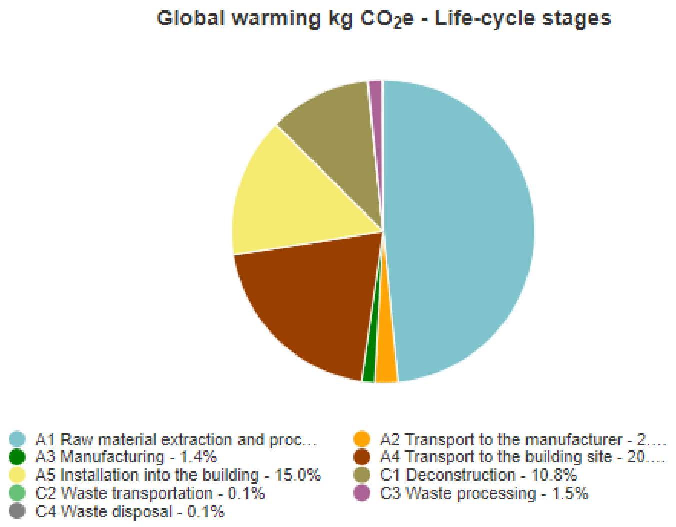
A logical complementary development

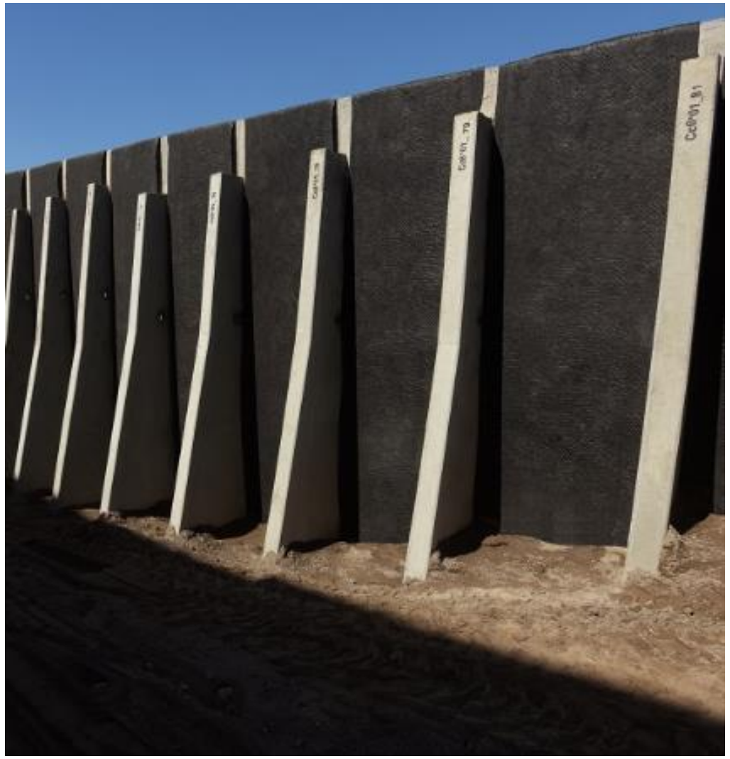
The **TerraLink™** technique allows building new Reinforced Earth® type walls connected to retaining structures such as slopes stabilized by nailing or existing retaining walls



TerraLink™

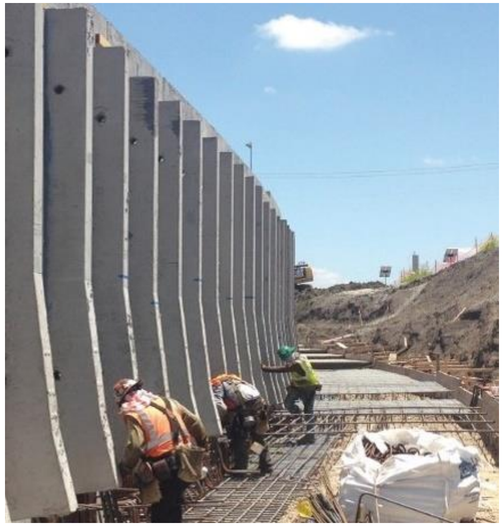
Unlimited Aesthetics

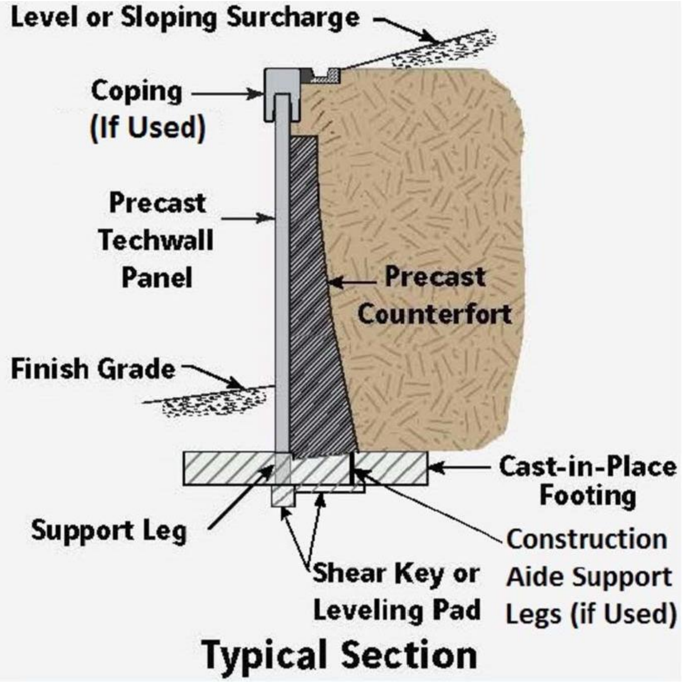




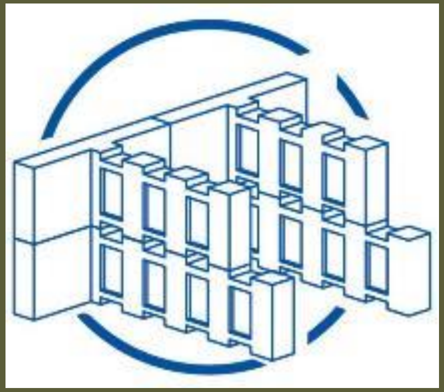
TechWall Counterfort panels
Up to 18m tall x 2.5m wide, 140mm thick
Site won back fill and minimal cut

TechWall®



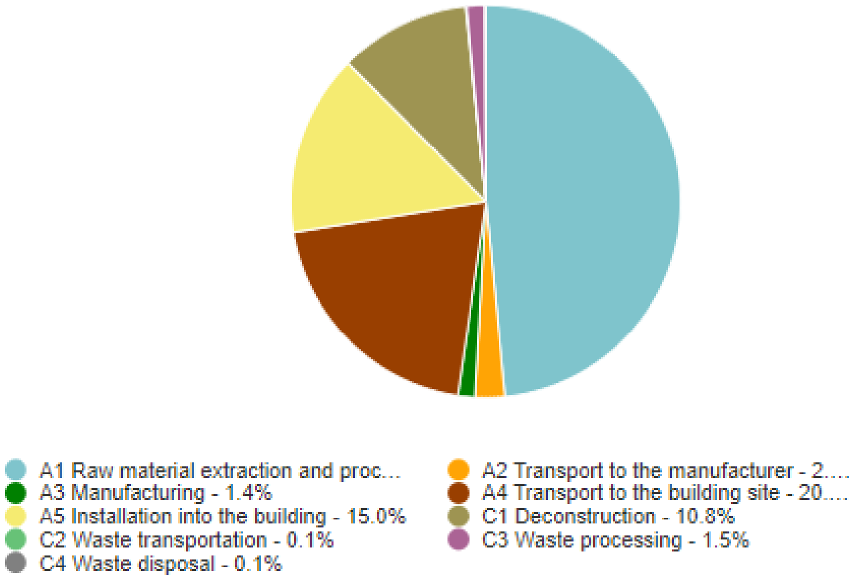

Level or Sloping Surcharge
Coping
(If Used)
Precast
Techwall
Panel
Precast
Counterfort
Finish Grade
Cast-in-Place
Footing
Support Leg
Construction
Aide Support
Legs (if Used)
Shear Key or
Leveling Pad
Typical Section

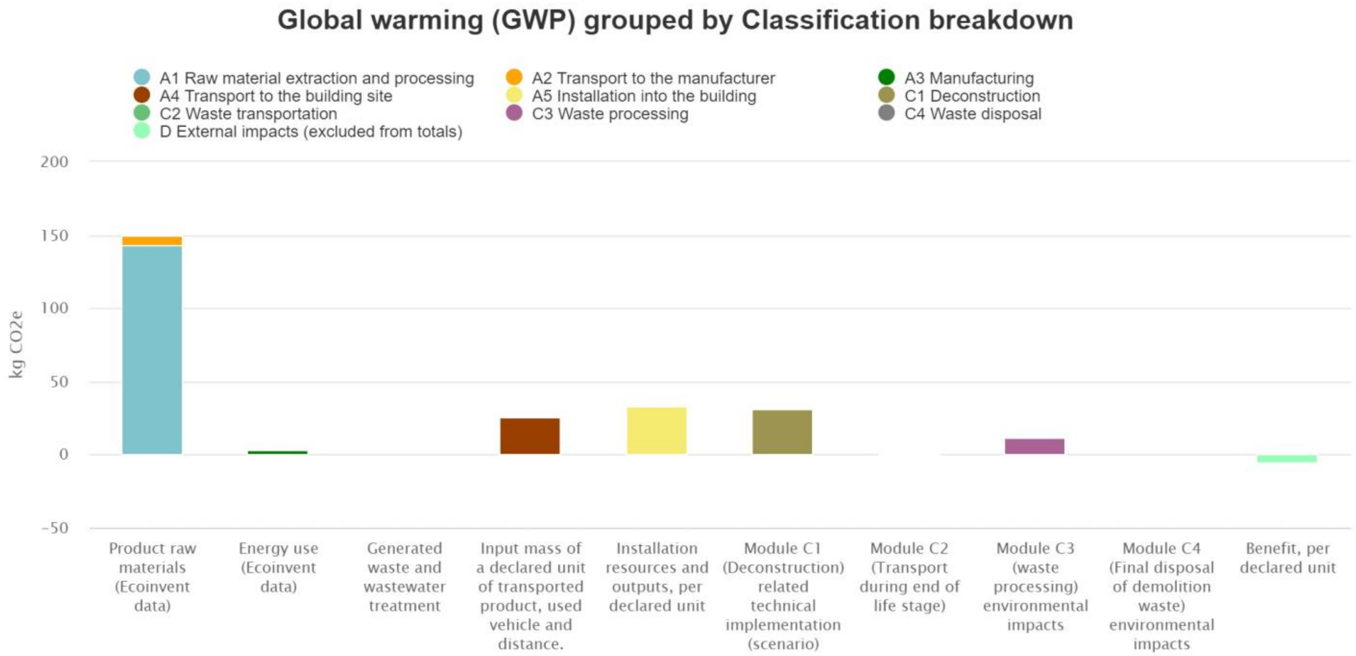
T-Wall Modular Stackable Panels for retaining walls, abutments. 140mm thick Any surface aesthetic



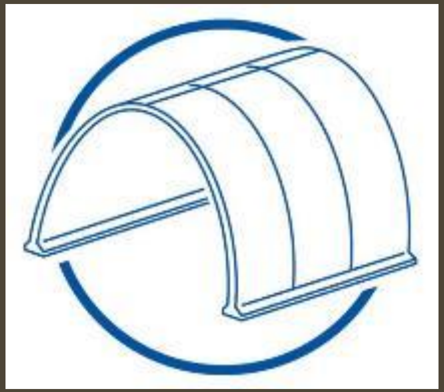
T-Wall®

Global warming kg CO_2e - Life-cycle stages





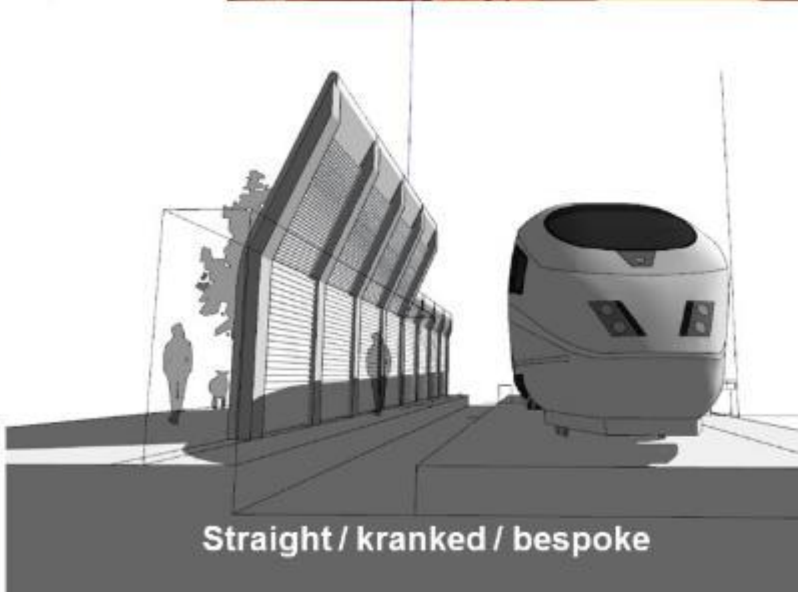
EcoDucts Arch Thickness 200-450mm. Spans to 30m



EcoDuct®

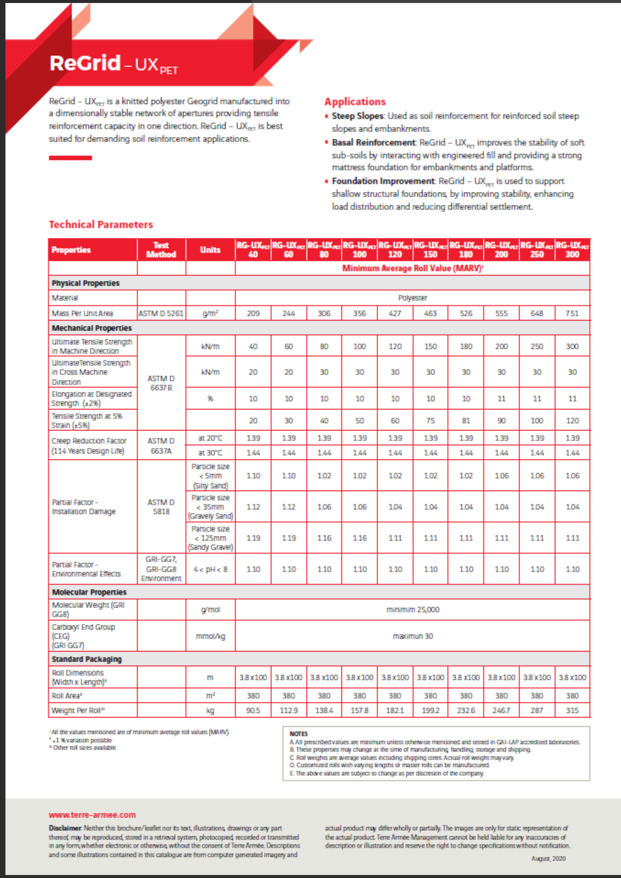

stock | #463555354

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

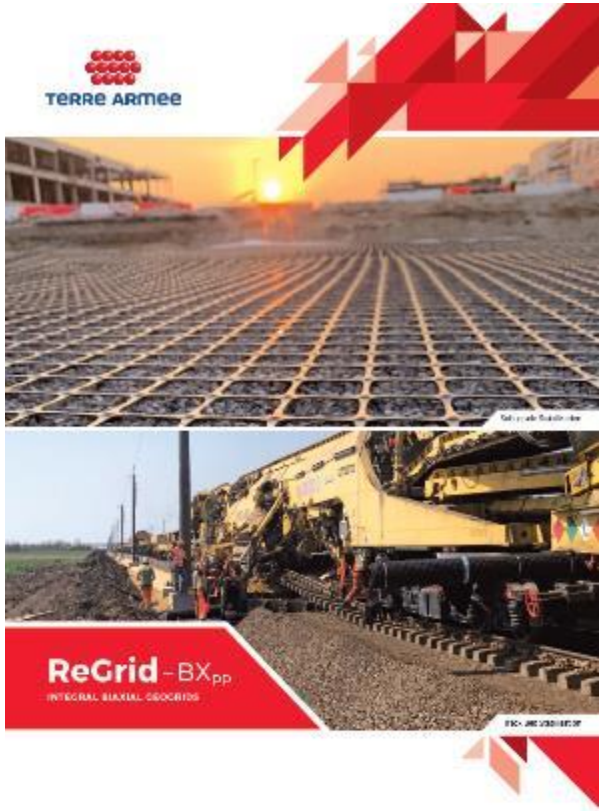
Properties	Test Method	Units	RG-UX_{PET} 40	RG-UX_{PET} 60	RG-UX_{PET} 80	RG-UX_{PET} 100	RG-UX_{PET} 120	RG-UX_{PET} 150	RG-UX_{PET} 180	RG-UX_{PET} 200	RG-UX_{PET} 250	RG-UX_{PET} 300
			Minimum Average Roll Value (MARV)[i]									
Physical Properties												
Material			Polyester									
Mass Per Unit Area	ASTM D 5261	g/m²	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
UltimateTensile Strength in Cross Machine Direction		kN/m	20	20	30	30	30	30	30	30	30	30
Elongation at Designated Strength (±2%)		%	10	10	10	10	10	10	10	11	11	11
Tensile Strength at 5% Strain (±5%)			20	30	40	50	60	75	81	90	100	120
Creep Reduction Factor (114 Years Design Life)	ASTM D 6637A	at 20°C	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39
		at 30°C	1.44	1.44	1.44	1.44	1.44	1.44	1.44	1.44	1.44	1.44
Partial Factor - Installation Damage	ASTM D 5818	Particle size < 5mm (Silty Sand)	1.10	1.10	1.02	1.02	1.02	1.02	1.02	1.06	1.06	1.06
		Particle size < 35mm (Gravely 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	GRI-GG7, GRI-GG8 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 (GRI GG8)		g/mol	minimim 25,000									
Carboxyl End Group (CEG) (GRI GG7)		mmol/kg	maximun 30									
Standard Packaging												
Roll Dimensions (Width x Length)[ii]		m	3.8 x100	3.8 x100	3.8 x100	3.8 x100	3.8 x100	3.8 x100	3.8 x100	3.8 x100	3.8 x100	3.8 x100
Roll Area[ii]		m²	380	380	380	380	380	380	380	380	380	380
Weight Per Roll[iii]		kg	90.5	112.9	138.4	157.8	182.1	199.2	232.6	246.7	287	315

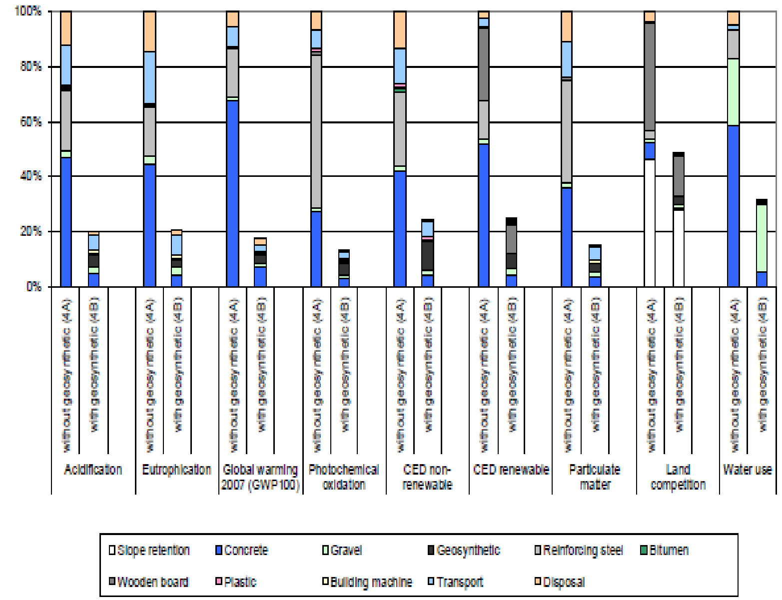
[i] All the values mentioned are of minimum average roll values (MARV).
[ii] ±1 % variation possible
[iii] Other roll sizes available

NOTES
A. All prescribed values are minimum unless otherwise mentioned and tested in GAI-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 cores. Actual roll weight may vary.
D. Customized rolls with varying lengths or master rolls can be manufactured.
E. The above values are subject to change as per discretion of the company.

www.terre-armee.com

August, 2020





Geosynthetics

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SUSTAINABLE TECHNOLOGY

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