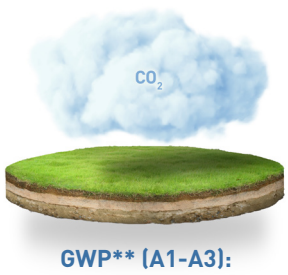
Geogrids demonstrably reduce the CO_2 footprint

Calculation example
Construction of bridge abutments*

The life cycle assessments of bridge abutments in conventional reinforced concrete construction are compared and geogrid-reinforced design, with a focus on CO_2 emissions and resource efficiency.

VS

Conventional abutment in in-situ concrete	Geogrid-reinforced bridge abutment (KBE)
	
380 m³ concrete	**150 m³ concrete**
	
98,000 kg steel **0 m² geogrid**	**27,000 kg steel** **3,900 m² geogrid**
	
2-14 days stripping period	**0 days stripping period**
	
GWP (A1-A3):** **185.000 kg CO_2 eqv.** **Environmental costs**:** **20.500 s€**	**GWP** (A1-A3):** **99.500 kg CO_2 eqv.** 79.500 kg CO_2 eqv.*** **Environmental costs**:** **10.000 s€**

Result:
The use of a geogrid-reinforced abutment instead of a conventional reinforced concrete structure shows that a significant reduction in CO_2 emissions (approx. 46 %) and environmental costs (approx. 50 %) can be achieved.

- **Less CO_2 emissions**
- **Construction with conventional equipment**
- **Short construction time**
- **Reduces construction and environmental costs**

* Life cycle inventories and CO2 footprint (phases A1-A3) for two abutments of a highway overpass with a span of approx. 36 m. Dimensions of the abutment: approx. H = 7.0 m, W = 7.0 m Source: LCA project no.: P000130622 kiwa / FH-Münster, 2022

** GWP=Global Warming Potential
Environmental costs include both internal costs (borne directly by the company) and external costs incurred by the general public incurred by the general public as a result of environmental damage that are not taken into account by the market.

*** By using unbound fill material and an alternative outer skin concept, a further reduction (at least 20 %) is possible. (at least 20 %) is possible.

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