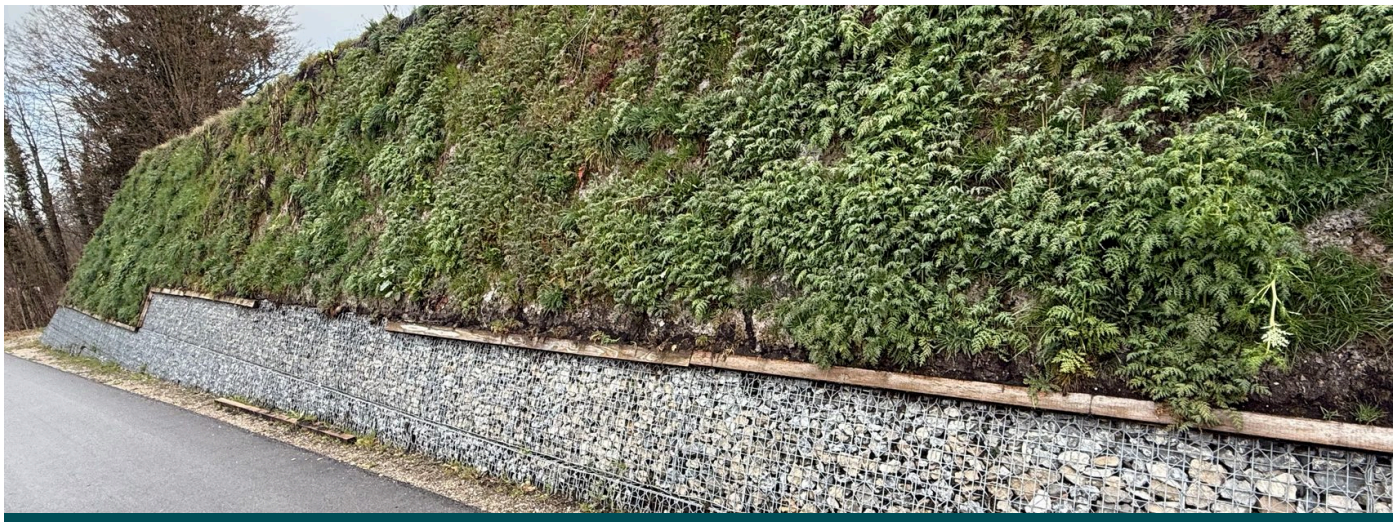
Hybrid Retention Structure for Road Slope Remediation at Ziegelberg, DE

Rosenheim Region (Stephanskirchen / Ziegelberg), Bavaria, Germany



View of the finished work

TYPE OF PROJECT	YEAR OF CONSTRUCTION	CLIENT	CONTRACTOR	DESIGNER
Reinforced Soil Walls And Slope Reinforcement	**2021**		**Bermüller & Co GmbH**	**Bermüller & Co GmbH**

PROD. RELATED
TerraMesh (Null)

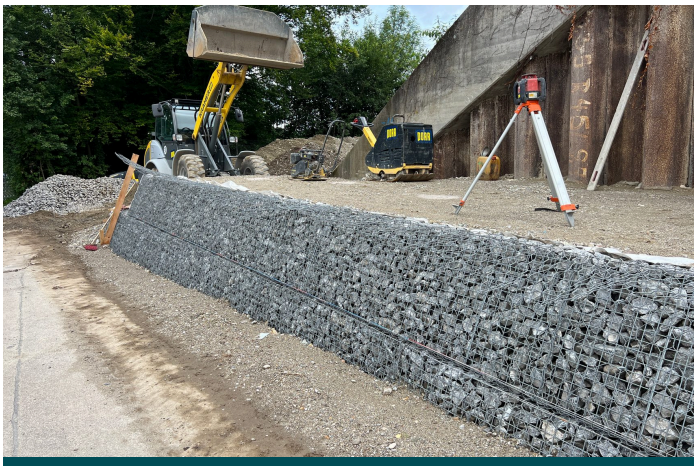
Challenge

Along the state road St. 2359 near Ziegelberg, structural deformations and structural damage occurred on an aging steel sheet pile wall that secured the vertical grade separation between the ascending main road/cycle path and a residential street located directly above..

The primary task was to partially dismantle the failed sheet pile wall and replace it with a sustainable, structurally verified retaining structure. The technical conditions were demanding: the structure had to accommodate construction heights up to 4.00 meters along a variable slope gradient, interface cleanly with localized sandy-gravelly backfill, and safely withstand maximum traffic loads from the heavy commercial transport route (*SLW 60* / 33.3 kN/m²) running directly along the upper crest.



Installation of the Mineral Terramesh system



Installation of the Mineral Terramesh system

Solution

To balance ultimate mechanical durability at the base with environmental aesthetics on the upper section, a customized hybrid engineered soil reinforcement solution was executed by BECO Bermüller und Co. GmbH with a steep 70° face inclination. The structure was designed utilizing factory-assembled, modular units made of double-twisted, heavily galvanized steel wire mesh (8x10 mesh type) with a Polimac coating to ensure a robust 100-year structural service life.

The project was constructed using a precise two-tier structural system layout:

- **Lower Tier – Base Protection (Mineral Terramesh®):** To withstand potential mechanical impacts at the base and potentially poorer plant growth in areas affected by road salt spraying, the lower two layers (up to ca. 1.50 meters in height) were implemented using a stone-filled facing.
- **Upper Tier – Eco-Berm (Green Terramesh®):** The upper layers transitioned into a greenable system lined with specialized erosion control blankets and backfilled with organic topsoil to encourage natural vegetation and minimize the visual impact along the corridor.

The embankment was successfully rehabilitated, partially dismanteling the old steel sheet piling and establishing a stable infrastructure configuration. Rigorous multi-scenario structural analysis verified that the custom system strictly conforms to modern Eurocode 7 and DIN 1054 structural safety limits.

Key Benefits Achieved:

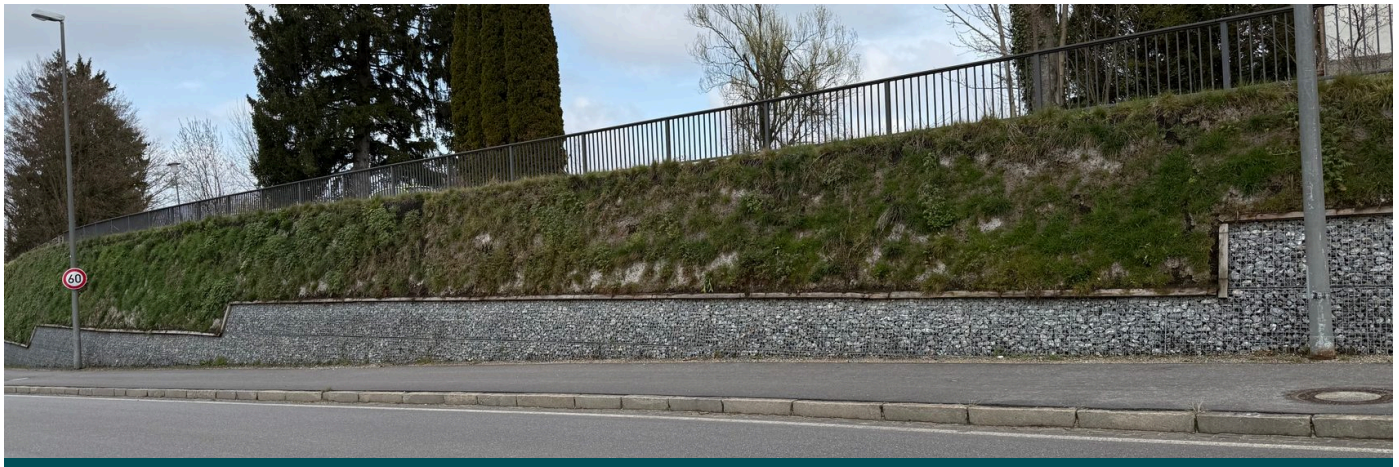
- **Optimized Dual-Zone Performance:** The hybrid design uniquely leverages the indestructible, impact-resistant properties of stone-filled units where loading and exposure are highest, while capitalizing on bio-engineered green finishes on top.
- **Heavy-Duty Structural Resilience:** Geotechnical computations verified absolute safety against slope failure, sliding, and deep-seated slip circles under full SLW 60 vehicle loads.
- **Fast & Flexible Site Adaptability:** The modular nature of the system allowed the installation crew to smoothly accommodate the ascending grade change of the roadway while avoiding major traffic disruptions.
- **Sustainable Asset Life:** Combining high-specification polimac-coated wire mesh with targeted subsoil replacement provides long-term resistance to erosion and weather extremes.



Installation of the Green Terramesh system



Green Terramesh during installation



View of the finished work

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