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ABS ROADS EVO - Stage II

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This research project aims to develop an innovative and sustainable composite mixture as an alternative to traditional concrete, with the goal of establishing a new long-term standard for permeable civil and road pavements with high technical performance.
The proposed mixture combines geopolymer binders, synthetic aluminosilicate-based materials known for their superior mechanical, chemical, and thermal properties, with significantly lower CO_2 emissions and energy consumption compared to Portland cement. These binders are integrated with a certified product derived from EAF steelmaking slags produced by Acciaierie Bertoli Safau (Danieli Group), offering mechanical characteristics comparable to natural basalt.
The resulting composite is environmentally friendly, avoids the use of virgin raw materials, reduces water and energy consumption, and lowers production costs. It is primarily intended for F900-class permeable pavements, but can also be applied to thin insulation layers and durable industrial surfaces.
The project is structured into three phases:

Laboratory Phase –Mix design development, raw material selection, and granulometric analysis using alkaline reagents.
Validation Phase –Mechanical and geotechnical testing of aggregates and mixtures, assessing strength, permeability, and frost resistance, along with technical and economic evaluations.
Semi-Industrial Phase –Construction of a test pavement at ABS, including installation trials, core sampling, performance verification, and final certification.

The project's originality lies in its integration of innovation, circular economy principles, and sustainability, aligned with the 4Rs: Reduce, Reuse, Recycle, Recover. A key deliverable is the certification by official Technical Bodies, essential for market adoption in public and private infrastructure sectors.

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