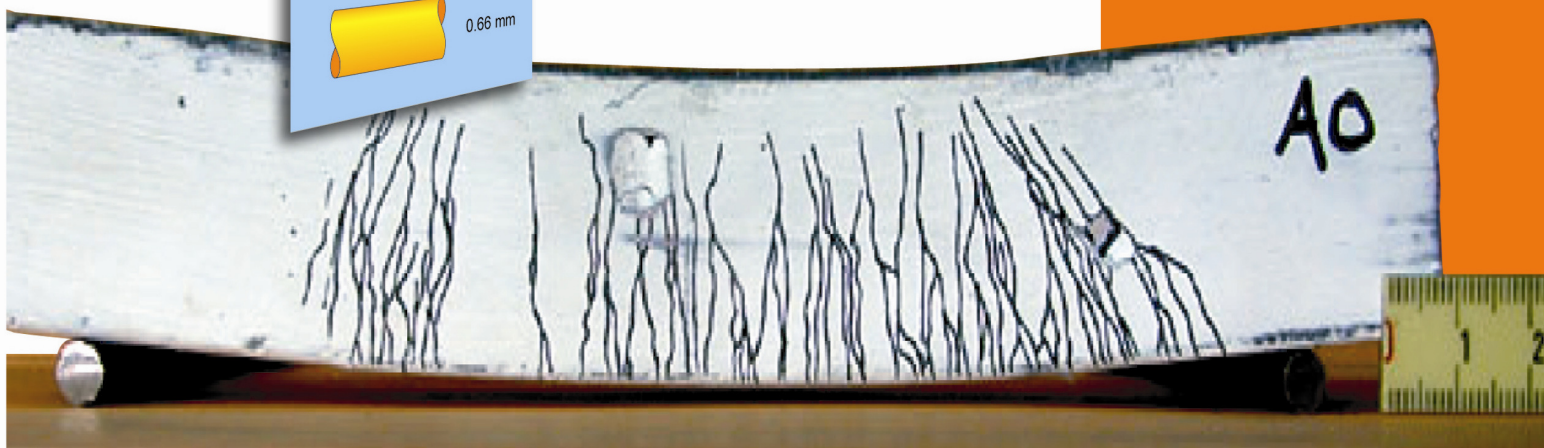
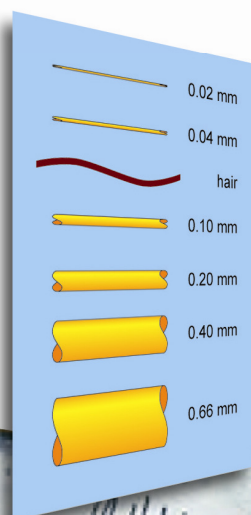


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High Fracture Energy Technologies

- l'alta energia di frattura per l'integrità strutturale delle costruzioni
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- la progettazione della duttilità delle strutture, murature duttili, solette duttili
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AWARD OF MERIT: Transportation Category

SAN MAURIZIO VIADUCT JOINT REPAIR

Near Bolzano, Italy

Submitted by **Tecnochem Italiana SpA**



The San Maurizio Viaduct, located on Highway A22 in northern Italy, was built in the 1960s and underwent repairs from 2006 to 2009. The main reason for repair was the continual failure of mechanical expansion joints between adjacent multiple-span bridge decks. The new solution to the problem of leaking expansion joints was the development of continuous bridge decks. This continuity was achieved by removing the expansion joints and replacing a portion of two adjacent decks with sections of reinforced ductile concrete.

Owner

Autostrada Del Brennero SpA
Trento, Italy

Project Engineer/ Designer

Autostrada Del Brennero SpA
Trento, Italy

Repair Contractor

Bilfinger Berger
Instandsetzung GMBH
Bressanone, Italy

Material Supplier/ Manufacturer

Tecnochem Italiana SpA
Bergamo, Italy

In the case of the San Maurizio Viaduct, the designers suggested substituting 80% of the mechanical joints using continuous low-stiffness ductile slabs. The adjacent bridge decks had been connected over four to six spans to a length of 590.5 ft (180 m). The link slabs needed the following properties: a high-deformation capacity under cyclic loading, a low Young's Modulus, high strength, and high resistance to fatigue. Ductile cement-based materials are able to absorb big deformation-generating, well-distributed small cracks without crack localization. This large strain capacity is over 100 times that of normal concrete. The ductile high-fracture energy concrete was then poured directly from the concrete mixer truck.

Reinforced ductile high-fracture energy concrete met all of the requirements that were essential for the link-slab application, as it has high strain capacity under tension and compression regime while forming small, closely spaced microcracks. It also allowed for the deformation under thermal loads, along with the creation of a partially uninterrupted deck to protect the underlying superstructure and substructure. Finally, the advantages were not just related to the lower repair cost. When considering lifecycle costs, the link slabs became not only feasible, but also advantageous. This was the first time that ductile link slabs had been used in Europe.

Award of Merit

Presented to

TECNOCHEM ITALIANA SPA

in recognition of the

SUBSTITUTION OF TRADITIONAL VIADUCTS JOINTS USING
DUCTILE LINK SLABS

Recognized for Excellence in the of Repair of Transportation Structures

October 21, 2010

