REINFORCEMENT OPTIMIZATION ON FRC STRUCTURES

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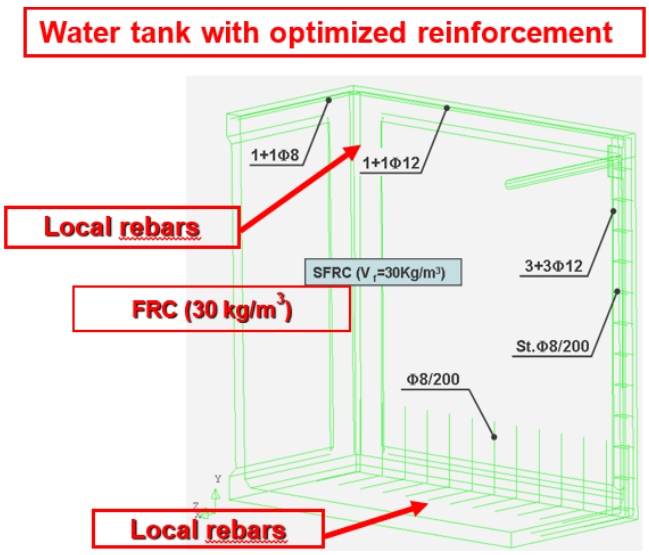
Structural optimization requires to meet structural performance requirements by using the minimum amount of structural materials.

A more comprehensive and new design perspective for structural elements could be tailored by properly combining fibers and rebar (Hybrid Reinforced Concrete, HRC). In fact, both localized stresses that can be resisted by localized rebar, and distributed stresses that are properly resisted by distributed fiber-reinforcement, are generally present in structures. Another approach to reinforcement optimization could be based on a distinction between principal stresses, assigned to rebar, and secondary stresses (due to secondary moments or to shrinkage and thermal stresses) assigned to fiber reinforcement.

Even though HRC is often conceived for Ultimate Limit State (ULS), it generally enhances structural behavior also at Serviceability Limit States (SLS). In fact, fibers could be just added to conventional reinforcement (as an extra reinforcement) providing a significant growth of residual tensile strength at crack, which determines in turn a substantial increment in the cracked structural stiffness and, consequently, a reduced deformation. In addition, the crack pattern is generally characterized by narrower and more closely spaced cracks that enhance structural durability.



Guests are welcome!

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