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EXPERIMENTAL STUDY ON THE EARLY-AGE CREEP AND SHRINKAGE OF PVA FIBER-REINFORCED HIGH STRENGTH CONCRETE

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Last three decades scientists and concrete technologists have been working on the development of new types of concrete. Newly elaborated material provides improved mechanical and physical properties. Creep and shrinkage of high strength concrete are complex problem, especially at very early ages, because of its brittleness and sensitiveness to cracking. The aim of this experimental study was to determine elastic and time-dependent deformations of polyvinyl alcohol (PVA) fibers reinforced high performance concrete. The experimental studies of shrinkage and early age creep were performed. High performance concrete mix with three different amount of fiber were developed and prepared. Concrete specimens were tested in a controlled constant temperature and with a constant level of moisture. The specimens were put into a creep lever test stand (see Fig. 1) and subjected to a uniform, constant compressive load. Stress levels were calculated from compression strength results after 1, 4, 7 and 14 day curing. During all tests other specimens were measured for shrinkage. The compression strength and modulus of elasticity of HPFRC concrete specimens were determined and compared with control samples without fibers. The creep deformations were found to decrease with concrete aging and time. The total lowest creep deformations, as well as the highest creep strain, were exhibited by the reference specimens.

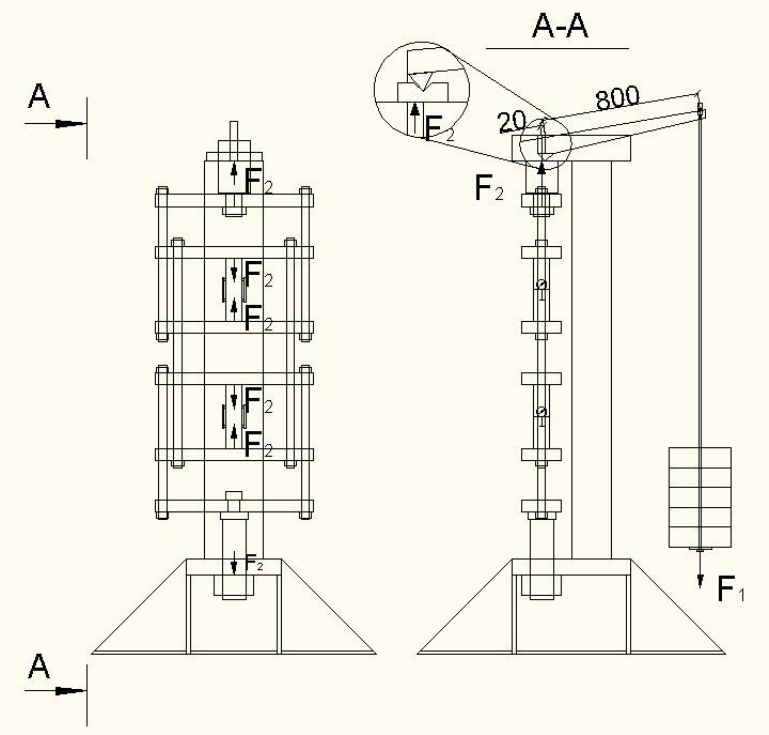

Fig. 1. Creep test lever stand.