

# INNOVATION OF OUTDOOR ROOF SPORTS FACILITIES FOR BASKETBALL AND SWIMMING POOL AT UNY TO INCREASE INCOME GENERATING AND EXCELLENT SERVICES

by Slamet Widodo, Siswantoyo, Ratna Budiarti, Faqih Ma'arif, Irvan Eva Salafi

## ABSTRACT

This research aims to determine (1) the composition of environmentally friendly concrete forming materials with added fly ash which utilizes the potential of PET waste; (2) PET fiber performance in bending tests; (3) the role of UPV in concrete quality evaluation control procedures; (4) indoor rooftop design for UNY basketball court. The method used in this research is research and development (R & D) with a quantitative approach: (1) Preliminary stage, which consists of (a) data collection and quality management information, namely the literature study stage, data, and information collection, (b) planning, namely the planning stage of goals, objectives and product descriptions for developing structural models; (2) Development stage, which consists of product development, namely the initial product planning stage, especially the preparation of SCC concrete forming materials; (3) Field trial phase consisting of (a) mixed trials (trial mixed), (b) revision of mixed trial field trial results, (c) compressive strength trials, split tensile strength tests, flexural strength trials (d) product refinement using the Ultrasonic pulse Velocity Test (UPV), (e) Flexural test of fibrous concrete beams. The expected results in this research are (1) the composition of the fibrous SCC forming material with added fly ash; (2) The flexural strength of fly ash with PET increased by 23.4% compared to without PET; (3) UPV can predict compressive strength, but cannot predict flexural strength; (4) Design an indoor rooftop using an auxiliary element program to obtain a three-joint arch structure with a diameter of 500mm for the main structure, and 300mm for the truss system.

Kata Kunci: *roof, sport, structure, analysis*