

Experimental Investigation on the Mechanical and Anti-Slip Performance of Rubberized Concrete Paver Blocks

Harish Nagarjun M

Kumaraguru College of Technology, Coimbatore, India

Aswin Bharath A

Kumaraguru College of Technology, Coimbatore, India

Anbalagan K

Kumaraguru College of Technology, Coimbatore, India

Kabilan T

Kumaraguru College of Technology, Coimbatore, India

Yokhabalan R B

Kumaraguru College of Technology, Coimbatore, India

Abstract

The growing demand for sustainable and safer paving materials has led to increased interest in rubberized concrete paver blocks with enhanced anti-slip performance. This study investigates the mechanical performance of anti-slip rubber paver blocks by partially replacing fine aggregate with waste rubber powder in M40 grade concrete. Rubber content was varied at 5%, 7%, 10%, 15%, 17%, and 20%, and the compressive and flexural strengths were evaluated at curing ages of 7, 14, and 28 days. Experimental results indicate that low rubber replacement levels (5–7%) exhibit comparatively higher strength values, with 28-day compressive strength reaching up to 53.89 kN and flexural strength up to 4.91 kN. A gradual reduction in both compressive and flexural strength was observed as the rubber content increased beyond 10%, with a significant strength loss at replacement levels of 15% and above. Despite the reduction in strength, rubberized paver blocks demonstrated improved elasticity and energy absorption characteristics, which are advantageous for anti-slip and impact-resistant applications. The results suggest that rubber replacement up to 7% provides an optimal balance between mechanical strength and functional performance, making it suitable for pedestrian pavements, sidewalks, and industrial flooring. Higher rubber contents may be utilized in non-load-bearing applications where slip resistance, noise reduction, and sustainability are prioritized. This study highlights the potential of waste rubber as an eco-friendly material for producing durable and anti-slip concrete paver blocks while contributing to effective waste management.