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**Use of M-Sand for Manufacturing Concrete Paving Blocks for Sri Lankan Roads****Chathuranga R.A.I.<sup>1</sup>, Udamulla K.M.L.A.<sup>2\*</sup>**<sup>1</sup>*University of Wolverhampton, United Kingdom*<sup>2</sup>*Department of Civil Engineering, Open University, Nawala, Sri Lanka**\*lakshika0807@hotmail.com***Abstract**

Sri Lanka is a developing nation undergoing many infrastructure development activities consuming more resources and civil engineering materials. River sand is one of the key raw materials that is used in civil engineering construction. Its scarcity compared to the rate of development has been a major issue in the construction industry. To overcome this issue and cater to the country's demand, Manufactured sand (M-sand) has been identified as a cost-effective alternative to the river sand. This work investigates the possibility of using M-sand to manufacture concrete paving blocks. The paving blocks were cast in proportions of M sand: natural sand in proportions of 100%:0, 75%:25%, 50%:50%, 25%:75% and 0%:100% for three series of Grade 15, Grade 25 and Grade 30 respectively. The mix proportions for Grade 15, 25 and 30 were 1:3:6, 1:1.5:3 and 1:1:2. The water-cement ratio of 0.5 was used for all three grades of concrete mixes. The compressive strength, unpolished slip resistance, and water absorption tests were carried out as prescribed in the Sri Lanka Standard 1425: part1:2011, the specification for concrete paving blocks: part 1-requirements. According to this specification the average compressive strength of class 1,2,3 and 4 denotes 50,40,30,15 N/mm<sup>2</sup> respectively. In series 1 (Grade 15), all samples achieved the adequate compressive strength of the strength class 4. When considering series 2 (Grade 25) all samples achieved a satisfactory level of strength in class 3. When considering series 3 (Grade 30), M-sand: river sand 75%:25 and 25%:75 achieved the satisfactory compressive strength of strength class 2 and 1. The unpolished slip resistance values for all samples in the three series were greater than 55, thus complying with the standard. The water absorption of series 1 was around 6% as prescribed in the standards. However, the water absorption of series 2 and series 3 samples (except for the control sample-100% river sand) gave slightly higher values than the prescribed value. Results show that M-sand could be used as an alternative to natural sand in concrete paving blocks, thus safeguard the natural sand resources. The study will help to prevent river sand mining and related environmental hazards and develop a low-cost alternative method of paving block manufacturing.

**Keywords:** Concrete paving blocks, M-sand, Compressive strength, Water absorption, Unpolished slip resistance