

Concrete waste application to the manufacturing of pieces for paving.

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Summary

It was analyzed the technical and economic feasibility of concrete paver blocks replacing aggregate with concrete pole residue (CPW) in the contents of 30%, 50% and 70%. The results indicated that the content of 50% CPW may be suitable for the manufacture of pavers compared to the reference mix considering the compressive strength, porosity and economic evaluation.

Key terms: wastes, economic feasibility, sustainability.

Introduction

The civil construction industry is responsible for 50% of solid waste generated. Reusing these wastes is important to reduce environmental impact of such activity (CACHIM et al., 2006).

The aim of this research was to verify the technical and economic feasibility of pavers by incorporating concrete pole waste (RC). For this purpose, pavers were made and assayed according to NBR 9781: 2013, at the age 28 and 56 days. They were also subjected to the porosimetry tests by mercury intrusion. The economic analysis was proposed from current market values.

Results and Discussion

The following two tables show the results of compression tests and porosimetry.

Table 1. Average compressive strength of the pavers at the age 28 and 56 days.

Level	Sc (MPa)	
	28 days	56 days
0%	26.47	-
30%	29.94	29.19
50%	32.13	29.71
70%	32.76	22.14

Table 2. Results of the porosimetry tests by mercury intrusion in the paver samples.

Level	Pores (%)	
	28 days	56 days
0%	8.47	-
30%	4.85	5.60
50%	-	11.80
70%	5.50	8.10

The RC was higher for all mix with CPW, except for the 70% level at the age 56 days. This can be justified by the percentage of pores in this sample (8.1%) close to that showed by the reference (8.47%).

Regarding the economic feasibility (Table 3), the cost have decreased as the recycled aggregates have increased. The 70% content showed a cost 25% lower than the reference value.

Table 3. Paver unit

cost.	Content	Unit cost [R\$]
	0%	0,61
	30%	0,56
	50%	0,52
	70%	0,49

Conclusion

The content of 50% CPW showed technical and economic feasibility towards pavers manufacturing, even with the reduced compressive strength and increased percentage of pores.

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