

Solid Waste Recycling

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The objective of promoting the recycling of solid waste from construction is to make the sector more sustainable. The importance of recycling has two aspects, social because it can add a lot of value in countries like India generating employment and income, and environmental because it is possible to considerably increase the life of landfills, and reduce the consumption of natural resources.

Considering that class A waste is that generated in greater quantity by construction, representing 50% to 70% of the entire mass of waste in construction. Brick, tiles, sand, masonry and concrete are among the products that can be reinserted directly into the activity.

Every year millions of dollars in waste are thrown into waste annually, the idea is to recycle this waste so that it can be inserted into the construction itself, reducing spending and even in the construction of other low-cost buildings or housing for needy people. Thinking about waste recycling, it is necessary to get awareness directly on the construction site, have a management where workers separate waste according to their class, iron, wood, cardboard and construction waste. In this way, every three buildings built, a room could be made only with recycled waste.

The purpose of this project is to recycle the rubble in the work itself. The idea is to have a mobile recycling unit in the works, the cost of the machine can be discounted from the cost of the material that will be recycled and reinserted into construction, generating more economy and sustainability. The machine can be rented by construction companies interested in the service, and it is on site that the whole process will occur. The workers will feed the machine with class A waste, this material will be crushed and transformed into sand and crushed stone to be reused in construction. Thicker waste can be used in the filling and sound insulation of floors. Currently there are already technical reports that prove the feasibility of reusing these materials. This practice can lead to savings of up to 70% in construction.

Another option is to use the demolition residue already crushed, mixed with binder material in the proportion of 6 residue measurements, 2 lime and 1 cement, right after sifting this mixture and placing it in the compression machine. This mixture can be used to produce ecological bricks that can be used in various ways. The following image shows the ready brick and the waste used.



The ceramic block and the concrete block from the rubble can be used to manufacture mortar as follows:

Step 1

Crushing waste.

Step 2

Sift the crushed rediduos in a 1.18 mm sieve to obtain a particle size similar to that of the sand.

Step 3

Mix the concrete block waste with a ceramic block with a ratio of 1 to 3. Then mix water/cement ratio of 1.14



Step 4

Settlement.



Results

The blocks seated with the mortar were left dry and exposed to time for 7 days, detachment test and compression test were performed. For the detachment test, a supported bi-beam was simulated. The resistance of sustainable mortar was very close to that of commercial sand mortar.



The compression test also obtained good results, proving the strength of the recycled mortar.



According to the tests carried out with mortar and the manufacture of blocks from the recycling of construction waste, it can be concluded that it is a viable solution for construction companies and smaller works, because in addition to promoting sustainability it generates cost reduction.