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Way to go: 3D-printed toilets for Swachh Bharat

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Technology devised by Bengaluru-based start-up can cut cost and construction time

Mumbai, December 26:

Prime Minister Narendra Modi's signature project, Swachh Bharat Mission, could soon see a big boost, with new toilets in rural areas being constructed using 3D printing technology, cutting down costs by almost 40 per cent, and reducing toilet-building time by nearly 80 per cent.

A Bengaluru-based 3D printing start-up, which is the winner of CES 2018 - Best of Innovation Awards, has developed a concrete 3D printer — or Concrete Additive Manufacturing Machine as it is called .

The machine, which costs about ₹15 lakh, can build toilets and small houses in a matter of days; the 3D-printed structures can fabricate floors and walls that are ready to be painted. "3D-printed houses have many advantages," Kaushik Mudda, CEO and co-founder, Ethereal Machines, explained.

“First, there is no construction waste at the building site. Second, you can freely select the thickness and configuration of the wall; the building has better insulation properties owing to the presence of air pockets within the walls. Walls can be additionally be insulated with suitable materials. And importantly, the overall cost is lower than that of its regular concrete counterpart,” Mudda added.

Concrete printing is a digitally controlled additive manufacturing method that can help build architectural and structural components without formwork, unlike conventional concrete construction methods. Printing concrete has the advantages of both self-compacting concrete (that is, self-compacting without any assistance) and sprayed concrete (where fresh concrete is expelled from a nozzle to fabricate complex forms) to meet the critical requirements of a free-form construction process.

In talks with cement firms

Ethereal Machines is in talks with a few cement companies, which plan to use this machine to make toilets for the government under the Swachh Bharat Mission. “These 3D-printed toilets will make construction extremely efficient in the remotest parts of the country, while at the same time reducing wastage and improving quality of construction,” Mudda said.

For example, from digging the earth to casting the plinth beam takes around 5-8 days, including curing time. On the other hand, the 3D-printed foundation takes less than half a day to construct and two days to cure. The total time of construction is reduced to a fourth.