# Uncovering Newer, Better Ways of Building Our Homes with 3D Concrete Printing

Think of innovative architectural designs such as curvilinear furniture, thematic design, and distinctive sculptural forms; these features – not common in today's housing projects – could soon become a reality for buildings and facilities in future HDB towns, as HDB steps up its investment in construction technology to uncover newer, better ways of building well-designed, quality homes.

Additive manufacturing, or 3D printing, has ushered in a new era of mass customisation, offering the ability to create three-dimensional objects with intricate details or geometric forms that would be near impossible to create using traditional methods. The customisability of 3D-printed concrete will allow HDB to produce more varied and free-form designs.

For a start, HDB will trial the use of 3D printing to build smaller fixtures, such as benches or pavilions, at selected projects in Tengah and Bidadari.

*Potential applications of 3D-printed concrete components*

To advance the use of 3D printing in public housing, HDB has set up the largest 3D concrete printer in Southeast Asia at its Centre of Building Research. This printer is capable of printing components up to 9m long, 3.5m wide and 3.8m tall.

*Scan to find out more about 3D printing!*

Successful printing trials have produced a printed component of about 11$m^2$ — the size of a room in an HDB flat — in 13 hours. The complete cycle for this first 3D-printed room, including the insertion of reinforcement bars, took only about six days. In comparison, it would have taken more than two months to build a similar room using traditional methods!

Building on these efforts, HDB will expand its research into other areas to enhance the printer's capabilities, such as using multiple nozzles to increase printing productivity and the development of a robotic system to place steel reinforcements into the concrete during the printing process. This will ensure that the construction of structurally sound rooms can be entirely automated.

Software will also be developed to seamlessly integrate the 3D concrete printer with architectural design software, thereby automating and improving processes that are currently being carried out manually.

Besides offering a revolutionary leap forward in the way homes are built, 3D printing technology could also boost construction productivity while minimising workmanship issues, as well as alleviate critical labour shortages at construction sites.

HDB recognises the potential of 3D concrete printing as a possible game-changer, and hopes to build up industry capabilities so that more players can adopt such technologies for high-rise buildings in future.