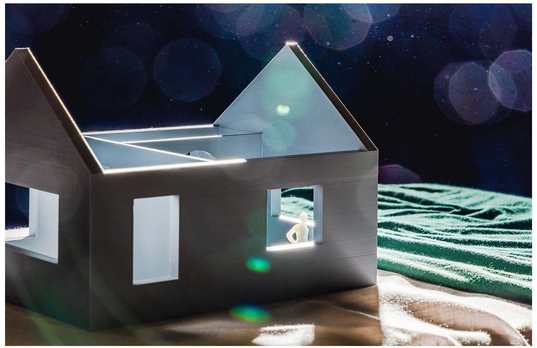
AN INSIGHT ON THE CURRENT AND FUTURE WORLD OF 3D PRINTED HOMES AND THEIR SOCIAL, ECONOMIC AND TECHNICAL IMPACT.

This project was a collaboration with industry partners Hannah Malein of MIX Magazine launched by Colourhive and WGSN.

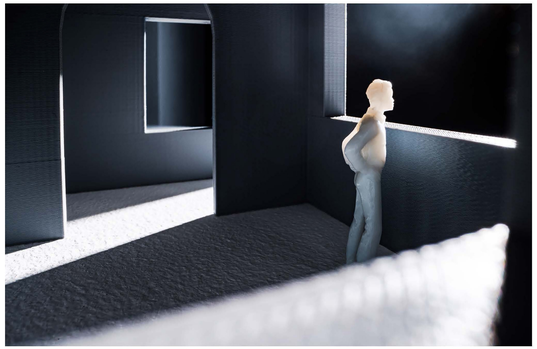
Interdisciplinary collaboration with L2 classmates and photohraphy students to study, analyse and predict some key future themes using trend forecasting especially in mind of sustainability.

Starting the project by using the brief given to us and in groups researching what we think may begin to surface as a design trend in the future – displaying our group's research through group meetings and on a shared mural board. Then collaborating with the university's fellow photography students for a photoshoot in order to achieve our desired magazine images.

3D PRINTED HOMES



WHAT IS 3D PRINTING?



R A D I C A L .

3D printing, or initially known as 'rapid prototyping' now also known as additive manufacturing is the process of transforming a digital file into a three-dimensional object through the process of depositing material layer by layer, these layers can be produced different thicknesses, the higher giving a better-quality resolution. 3D printing is known to be the opposite of subtractive manufacturing in which a piece is taken out. This process allows you to create complex and detailed objects with less wastage than the traditional manufacturing process.

The evolution in the building sector has ramped up, reduced the cost, and improved the sustainability of home development. With the help of modern technology, we have created a new path that might soon become the standard. 3D printing has been around since the 1980's then later came the Contour Crafting System, a vast 3D printer that could literally print buildings in place, was unveiled in 2006 by Dr. Behrokh Khoshnevis of the University of Southern California. The rationale is that the parts can simply be printed on an as-needed basis. This also means that warehouses can carry less physical inventory but potentially more stock keeping units. In addition to producing hollow walls, which naturally consume less material, the printer only uses the precise quantity of concrete necessary to bring a computer model to life. On-site installation and formwork are not necessary, and the amount of building waste that would often wind up in a landfill is greatly reduced.

PHOTOGRAPHY BY EDWARD BROWN

With 3D printed homes on the rise, many may not be aware of how beneficial this new technology is for our progressive society. The building envelopes, partitions, and concrete walls of the house can all be printed out using the printer however, the builder still needs to paint the house, put in the wiring, add the roof, and add insulation. Homes built by intelligent machines are of in expense compared to manual labour of homes, and the construction process is quite rapid and of high quality. The speed is the primary concern of the 3D printing robots. It won't be too long before 3D printing becomes practical if the home does not always require a stunning architectural design.

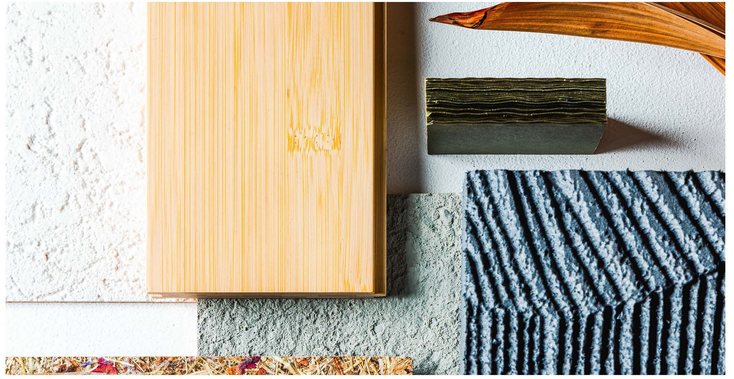
Power-based 3D printing has advanced significantly in the manufacturing sector, but 3D construction is still in its primitive stage. These new 3D-printed homes also may change how we interpret them to be built. Some homes, like those on East 17th Street, have been built to resist the harsh weather that can occur in the US, including earthquakes and severe winter storms. Some brand-new houses use renewable energy. The PassivDom house is one of the most energy-efficient 3D printed homes available. It runs fully on solar power and clean and recycled water, giving it an "off the grid" appearance.

"OFF THE GRID"

R A D I C A L .

Structures made of organic, sustainable, and renewable materials, such as mud-brick homes, bamboo composite structures, or spherical earthenware homes, can be manufactured using 3D printers. Printed buildings can significantly minimise their carbon footprint by using less resources, producing less waste, demanding less transportation, and possibly using natural or recycled materials. Researchers at the University of Tehran have developed a novel concrete that can be 3D printed into houses in a way that generates 400 times less CO_2 emissions than current builds. With the exception of equipment cost, they are quicker than traditional construction, allowing workers to focus more on other tasks like tiling or other sites, theoretically increasing the capacity of construction. Through 3D printing, it is possible to turn waste plastic into a sturdy building material for eco-friendly housing. Although this recycling approach has certain logistical hurdles.

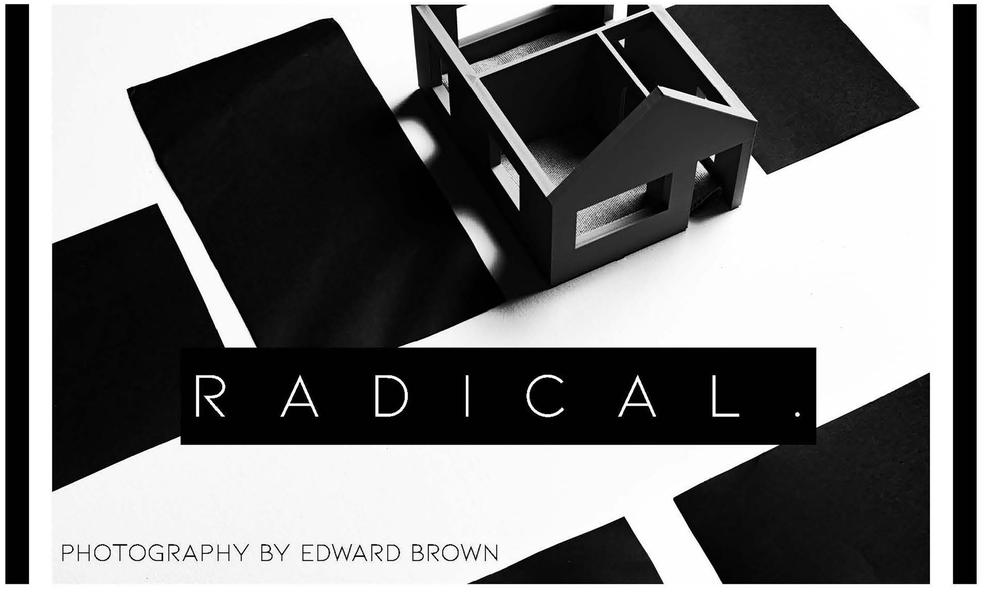
PHOTOGRAPHY BY EDWARD BROWN



approach to the design on a 3D printed house following the digital file to the production of the 3D house being that majority of houses that have been built and are in the process of being built consist of one story. This is becoming to be more challenged through the manufacturing of multiple story 3D printed homes. The first multi-storey 3D printed home is now being constructed in Houston, USA by Ithaca a New York based studio using 3D printed concrete combined with wooden framing.

"The project showcases the possibilities of 3D printing technology, mass customization and design solutions that integrate conventional construction methods," says Hannah of Ithaca. Despite the phenomenal innovation of this design, these new 3D-printed residences still carry a stigma. Given that the majority of these homes are made of concrete and have textured surfaces, they often lack an appealing physical aspect.

THE GLOBAL 3D PRINTING MARKET VALUES AT $13.8 BILLION.



PREDICTIONS THAT THE 3D PRINTING INDUSTRY WILL GROW AT SPEEDS - BETWEEN 18% AND 27% PER YEAR.

What many people might not realise is that these new technologies are not only expanding our understanding of how to produce things, but they are also beneficial to society in ways we would not have anticipated. Africa's largest 3D housing project was developed by Mvule Gardens in Kenya to address the continent's housing crisis and to help make green, low-cost, and affordable housing a reality. Created using 3D printable dry mortar this ensures houses are adequately as strong with a reduced carbon footprint.

However, it may be argued that there is less of a need for manual labour and less people working these jobs, therefore contributing towards and increase of those in unemployment but where new technology is submerging, new jobs arise with these within engineering and the technological advances we may see in the future. While 3D printed homes are on the rise and becoming more widespread knowledge there is still so much to be learnt and discovered about this technology but as of this current day it could be seen as a progressive new insight for housing and our society.