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REalVIEW

a monthly realty news digest

ASSET

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Dear Readers,

REalVIEW is a monthly news digest bringing to our clients and well-wishers news updates on major developments in the realty industry . The periodical will keep the readers updated on the significant changes and trends affecting real estate development within the country as well as globally, thus helping them in taking informed and calculated investment decisions.

Responsibly yours,

V. Sunil Kumar
Managing Director
Asset Homes

A social tool for evaluating the environmental impact of residential buildings

For the first time an open-source computing tool which can, simply and intuitively, calculate the CO2 emissions in each phase of a building project, in order to obtain a global picture of its carbon footprint from its conception and to help decide every variable in the construction process.

"The first step in managing and reducing the CO2 emissions associated with building construction is to calculate them, to know the importance of this environmental aspect and apply measures to improve the situation. To better understand the environmental impact and work on it, it is important to measure the CO2 emissions from the design and conception of the building and, according to its measurements, know the different possibilities for reducing its carbon footprint and making a more sustainable, low-carbon building,"

The experts point out that it is vital to be aware of the CO2 emissions that are generated in the first phases of a project, so that early preventative actions can be taken by means of the choice of different materials, mean of transport, construction methods, use during the life of the building, deconstruction systems, reuse, etc., so contributing to reducing the building's emissions.

Courtesy: https://www.sciencedaily.com/releases/2018/07/180719101258.htm

Self-healing fungi concrete could provide sustainable solution to crumbling infrastructure

A new self-healing fungi concrete could help repair cracks in aging concrete permanently, and help save crumbling infrastructure.

"Without proper treatment, cracks tend to progress further and eventually require costly repair," said Jin. "If micro-cracks expand and reach the steel reinforcement, not only the concrete will be attacked, but also the reinforcement will be corroded, as it is exposed to water, oxygen, possibly CO2 and chlorides, leading to structural failure."

These cracks can cause huge and sometimes unseen problems for infrastructure. One potentially critical example is the case of nuclear power plants that may use concrete for radiation shielding. While remaking a structure would replace the aging concrete, this would only be a short-term fix until more cracks again spring up. Jin wanted to see if there was a way to fix the concrete permanently.

Jin worked with professor Guangwen Zhou and associate professor David Davies, both from Binghamton University, and associate professor Ning Zhang from Rutgers University. Together, the team set out to find a way to heal concrete and found an unusual answer: a fungus called Trichoderma reesei. When this fungus is mixed with concrete, it originally lies dormant -- until the first crack appears.

"The fungal spores, together with nutrients, will be placed into the concrete matrix during the mixing process. When cracking occurs, water and oxygen will find their way in. With enough water and oxygen, the dormant fungal spores will germinate, grow and precipitate calcium carbonate to heal the cracks," explained Jin.

The research is still in the fairly early stages, with the biggest issue being the survivability of the fungus within the harsh environment of concrete. However, Jin is hopeful that with further adjustments the Trichoderma reesei will be able to effectively fill the cracks.

Courtesy: https://www.sciencedaily.com/releases/2018/01/180117152511.htm

continued to page 02

System can 3-D print an entire building Tech could enable faster, cheaper, more adaptable building construction

The list of materials that can be produced by 3-D printing has grown to include not just plastics but also metal, glass, and even food. Now, MIT researchers are expanding the list further, with the design of a system that can 3-D print the basic structure of an entire building.

Structures built with this system could be produced faster and less expensively than traditional construction methods allow, the researchers say. A building could also be completely customized to the needs of a particular site and the desires of its maker. Even the internal structure could be modified in new ways; different materials could be incorporated as the process goes along, and material density could be varied to provide optimum combinations of strength, insulation, or other properties.

The system consists of a tracked vehicle that carries a large, industrial robotic arm, which has a smaller, precision-motion robotic arm at its end. This highly controllable arm can then be used to direct any conventional (or unconventional) construction nozzle, such as those used for pouring concrete or spraying insulation material, as well as additional digital fabrication end effectors, such as a milling head.

Unlike typical 3-D printing systems, most of which use some kind of an enclosed, fixed structure to support their nozzles and are limited to building objects that can fit within their overall enclosure, this free-moving system can construct an object of any size. As a proof of concept, the researchers used a prototype to build the basic structure of the walls of a 50-foot-diameter, 12-foot-high dome -- a project that was completed in less than 14 hours of "printing" time.

For these initial tests, the system fabricated the foam-insulation framework used to form a finished concrete structure. This construction method, in which polyurethane foam molds are filled with concrete, is similar to traditional commercial insulated-concrete formwork techniques. Following this approach for their initial work, the researchers showed that the system can be easily adapted to existing building sites and equipment, and that it will fit existing building codes without requiring whole new evaluations, Keating explains.

Ultimately, the system is intended to be self-sufficient. It is equipped with a scoop that could be used to both prepare the building surface and acquire local materials, such as dirt for a rammed-earth building, for the construction itself. The whole system could be operated electrically, even powered by solar panels. The idea is that such systems could be deployed to remote regions, for example in the developing world, or to areas for disaster relief after a major storm or earthquake, to provide durable shelter rapidly.

The creation of this system, which the researchers call a Digital Construction Platform (DCP), was motivated by the Mediated Matter group's overall vision of designing buildings without parts. Such a vision includes, for example, combining "structure and skin," and beams and windows, in a single production process, and adapting multiple design and construction processes on the fly, as the structure is being built.

From an architectural perspective, Oxman says, the project "challenges traditional building typologies such as walls, floors, or windows, and proposes that a single system could be fabricated using the DCP that can vary its properties continuously to create wall-like elements that continuously fuse into windows."

To this end, the nozzles of the new 3-D printing system can be adapted to vary the density of the material being poured, and even to mix different materials as it goes along. In the version used in the initial tests, the device created an insulating foam shell that would be left in place after the concrete is poured; interior and exterior finish materials could be applied directly to that foam surface.

The system can even create complex shapes and overhangs, which the team demonstrated by including a wide, built-in bench in their prototype dome. Any needed wiring and plumbing can be inserted into the mold before the concrete is poured, providing a finished wall structure all at once. It can also incorporate data about the site collected during the process, using built-in sensors for temperature, light, and other parameters to make adjustments to the structure as it is built.

Keating says the team's analysis shows that such construction methods could produce a structure faster and less expensively than present methods can, and would also be much safer. (The construction industry is one of the most dangerous occupations, and this system requires less hands-on work.) In addition, because shapes and thicknesses can be optimized for what is needed structurally, rather than having to match what's available in premade lumber and other materials, the total amount of material needed could be reduced.

While the platform represents an engineering advance, Oxman notes. "Making it faster, better, and cheaper is one thing. But the ability to design and digitally fabricate multifunctional structures in a single build embodies a shift from the machine age to the biological age -- from considering the building as a machine to live in, made of standardized parts, to the building as an organism, which is computationally grown, additively manufactured, and possibly biologically augmented."

Courtesy: https://www.sciencedaily.com/releases/2017/04/170426183028.htm

Protection system for building works on sloping work surfaces, such as roofs

The system allows to properly retain a would-be injured person, avoiding his/her possible impact against the system racks and also to prevent the fall of materials or objects. It can be easily installed with great flexibility to adapt to the characteristics of any building surface.

The main advantage of the technology is that it provides a simple laboratory-proven solution for the problem of impacts against the hard parts of the system with falls in building works with sloping surfaces.

"Security in such areas was not completely resolved so far, since the usual railings could protect against the fall in height but this exposed the injured person to injure him or herself even more when sliding and impact against the rail fasteners. This drawback has been overcome, adapting perfectly to the UNE-EN 13374 for Type B and C rails, without having to develop a complex system", lecturer Ramón Irles Más, the person responsible for the research explains.

This protection system is robust and allows both the injured and the construction materials or other objects to be held back with a safety net, with low cost and easy installation. "It requires no equipment or skilled labour for installation, and it is completely modular so they can expand and adapt to the needs of each work", Ramón Irles Más adds.

The technology is fully developed and there are different prototypes of protective barriers. For validation, we collaborated with the Technological Institute of Construction (AIDICO) and companies. Currently, the technology is available to any business or organization interested in selling, construction and distribution.

Courtesy: https://www.sciencedaily.com/releases/2013/09/130906101338.htm