

FOR IMMEDIATE RELEASE



Virginia Housing Further Invests in 3D Printed Homes through \$1.1 Million Grant to Virginia Tech Researchers

--

Funds will purchase India-built 3D mobile printer and expand testing, learning and knowledge sharing among housing partners statewide

--

Plans call to build 10 affordable homes across Virginia with the printer by 2026

VIRGINIA BEACH, Va. – Nov. 14, 2024 – Virginia Housing today announced a \$1.1 million Community Innovation Demonstrations grant to the Virginia Center for Housing Research at Virginia Tech to purchase an advanced, mobile 3D construction printer. Grant funds also will enable 3D Concrete Printing (3DCP) tests, training, research and partnerships to print 10 affordable homes across Virginia by 2026.

A mobile, cost-effective 3D construction printer to save time and money

Being demonstrated for the first time in the Commonwealth at the Virginia Governor’s Housing conference this week, the Tvasta SIRA RC20 is a robotic crawler arm-based 3D concrete printer featuring:

- **Robotic Arm Design:** Unlike larger gantry-based systems, the SIRA RC20 uses a multi-axial robotic arm, offering greater flexibility and precision.
- **High Payload Capacity:** Engineered to handle heavy components, the SIRA RC20 can produce large-scale construction elements.
- **Customizable Motion Systems:** The printer offers tailored motion systems to meet specific project requirements, enhancing versatility for different types of projects.
- **Eco-Friendly Design:** This system minimizes material waste and can use low-carbon mixes and recycled concrete mixes to create energy-efficient structures.



Refined from bulky, larger systems, the nearly 11-foot high, 4-ton eco-friendly printer can cut construction time and waste. In 2021, Tvasta, an Indian engineering tech startup, built India’s first 3D-printed house – a 600-square-foot structure – in 21 days using layered concrete. The company, started by alumni of the Indian Institute of Technology Madras, currently makes six different 3D construction printers.

3DCP involves an additive construction process to create concrete structures layer by layer. Unlike traditional construction methods that rely on molds and manual labor, 3DCP automates the process, allowing for faster, more precise construction with less material waste. This technology is primarily used to build walls, structural components, and even entire buildings.

Tammy Neale, CEO of Virginia Housing, said, “For years, we have been working with our partners, exploring innovative construction techniques. This collaboration with Virginia Tech marks a pivotal step forward.” She added, “This latest program allows us to quickly test, learn, and train future workers and partners to advance and scale 3D-printed housing across the Commonwealth.”

About the Innovation Demonstration grant

Phase 1 of the grant is underway and focuses on purchasing and maintaining the robotic-arm 3D printer. The other three phases will create a 3DCP grassroots service for affordable housing projects in Virginia and include:

- **Phase 2:** Training construction partners in 3DCP technology, starting with two training cohorts in the first year and increasing to four in the second year.
- **Phase 3:** Advancing research with Virginia Tech’s faculty to expand 3DCP knowledge and applications.
- **Phase 4:** Collaborating with Virginia developers to construct durable, high-performance housing that meets community needs.

Virginia Tech faculty and staff from the Myers-Lawson School of Construction, Virginia Center for Housing Research (VCHR), The School of Architecture and Design and the Department of Civil and Environmental Engineering (CEE) will be involved along with undergraduate and graduate students. **Dr. Andrew McCoy** with VCHR and **Dr. Alex Brand** with CEE applied for this latest Virginia Housing grant after partnering with the state housing finance agency in the past.

Dr. McCoy, who directs VCHR, is Beliveau Professor in Virginia Tech’s Department of Building Construction, and associate director of the Myers-Lawson School of Construction, said, “Our goal is not to be homebuilders, but to facilitate the homebuilding process using 3D printing technology. Our role as educators is to bring these technologies to Virginians, translate their opportunities and equip Virginia contractors and developers with the knowledge and training needed to leverage 3DCP technology for affordable housing.”

Regarding the 10 homes to be printed in Virginia, McCoy said the site selections are still in the works, but he added, “By building multiple 3D-printed homes on different lots at the same site, we plan to study potential production-level cost and schedule savings, helping us to focus on Virginia’s supply chain, its risks, and maximize efficiencies for the industry beyond Virginia.”

Building off past 3D printing pilots

In 2021, Virginia Housing’s Community Innovation Demonstrations Grant funded \$500,000 for the "Printing for Affordable Concrete Housing and Training" (PACT) with the Virginia Center for Housing Research at Virginia Tech. That grant secured a large-format, gantry-style 3D home printer from a Danish company called COBOD (**C**onstruction **O**f **B**uildings **O**n **D**emand).

Virginia Tech professors and students, along with local housing and construction partners,

printed the concrete walls of a 1,550-square-foot home in Richmond and later a 1,250-square-foot home in Williamsburg. They used traditional construction techniques to finish other parts of the home. Both homes were sold to lower-income families. Virginia Tech further expanded its 3DCP efforts, partnering on the completion of two additional homes in Newport News in December 2023.

About Virginia Housing

By investing in the power of home, Virginia Housing transforms where and how thousands of Virginians live and thrive, strengthening communities and the economy. Virginia Housing has worked for over 50 years in partnership with the public and private sectors to help Virginians attain quality, affordable housing. While receiving no state taxpayer dollars, Virginia Housing raises money in capital markets to provide mortgages to first-time homebuyers, financing for rental developments and neighborhood revitalization efforts. Virginia Housing invests in innovations in affordable housing and makes homes for people with disabilities and older Virginians more livable. Learn more at VirginiaHousing.com and review the most recent annual report.

###

Media Contacts:

For Virginia Housing

Adrian Robinett with Virginia Housing
Adrian.Robinett@VirginiaHousing.com | 276-971-0494

Jonathan Rhudy with Rhudy & Co.
jonathan@rhudy.biz | 804-519-2998

For Virginia Center for Housing Research

Andrew P. McCoy with The Virginia Center for Housing Research at Virginia Tech
apmccoy@vt.edu | (540) 449-1861