Iowa State University: 3D Printing Housing in Iowa
COLLABORATING TO DEVELOP 3-D PRINTING TECHNOLOGIES FOR HOUSING IN RURAL IOWA

Like many states, Iowa struggles with its rural populations flooding to denser metropolitan areas. While for some this is unavoidable due to greater workforce opportunities in larger cities, there is another problem that plagues many small communities throughout Iowa and is further challenging them: the lack of affordable, quality housing stock in small, rural communities. In addition, there is a shortage of construction workers for new development projects. In short, this is forcing some out who might choose to stay in these communities.

The State of Iowa in December 2021 incented the Iowa State University College of Design to find faster, cheaper solutions through 3-D printed homes by awarding them a $1.4 million Strategic Infrastructure Program (SIP) grant for the Iowa State College of Design’s 3-D Affordable Innovative Technologies (3-D AIR) Housing Project. Achieving the funding milestone was a more than two-year effort and the project, when fully funded, is proposed to be $2.14 million, including the SIP grant.

WHY 3-D PRINTING OF HOMES?

Housing technologies have remained nearly the same in the last century, and current materials are not as resilient against disasters such as flooding and extremely high winds. 3-D house printing can lower construction costs, reduce material usage, decrease waste, and provide affordable and sustainable housing.

Powered by a $1.4 million Structure Infrastructure Program grant from the Iowa Economic Development Authority (IEDA), the 3-D Affordable Innovation Technologies Housing Project, the team at ISU will acquire a 3-D construction printer, 3-D concrete materials and components, and develop the infrastructure to develop the suite of tools, research and curriculum.

“Nationwide, rural housing issues are often overlooked,” said Luis Rico-Gutierrez, dean of the College of Design. “For Iowa State, they are central to our priorities as a land-grant institution. This funding allows us to address all aspects of the process, from planning to developing new building codes through construction and the impact on the quality of our lives.”
Statewide Impact and Outreach the project involves multidisciplinary collaboration across ISU, including the College of Design, School of Education, ISU Extension and Outreach and multiple graduate and undergraduate research assistants. It also includes Iowa Central Community College (ICCC), located in Fort Dodge. The partnership with ICCC includes housing a 3-D construction printer and a training program for future workers in advanced home construction. Iowa State departments in critical materials engineering will conduct research in material development and testing. Community and regional planning students will work through zoning and building codes and community engagement, and project management, and the groups will all coordinate and collaborate with Iowa State Extension and Outreach and the Small Business Development Centers to deploy and engage with company partners and contractors across the state. In addition, partnerships will be formed in the near term with these groups to establish demonstration sites or through ISU Extension and Outreach – as project assets, technologies and infrastructure are made available.

Initially, the team will work with an Iowa-based woman-owned construction company, Brunow Contracting, on a demonstration building in Hamburg. This community was devastated by floods in 2019. The demonstration build will include a 40-unit development and will help the team understand design, affordability, zoning, and building codes.
LINKS TO FURTHER INFORMATION

Articles:
- New ISU project will design 3D-printed housing for rural Iowa
- IEDA Board approves project from two established companies in Iowa, awards strategic infrastructure grant
- Iowa State’s College of Design working to create affordable housing through 3D printing

Partners
- Empower Rural Iowa: Revitalizing Iowa
- Brunow Contracting
- Iowa Economic Development Authority
- Iowa Central Community College
- Iowa State University Extension and Outreach
- Small Business Development Center - Iowa
ABOUT APLU
The Association of Public and Land-grant Universities (APLU) is North America’s oldest higher education association. APLU is a research, policy, and advocacy organization dedicated to strengthening and advancing the work of public universities in the U.S., Canada, and Mexico. The association's membership consists of public research universities, land-grant institutions, state university systems, and affiliated organizations.

APLU's mission is to: expand access and improve student success to deliver the innovative workforce of tomorrow; advance and promote research and discovery to improve society, foster economic growth, and address global challenges; and build healthy, prosperous, equitable, and vibrant communities locally and globally.

Based in Washington, DC, the association's work is furthered by an active and effective advocacy arm that works with Congress and the administration as well as the media to advance federal policies that strengthen public universities and benefit the students they serve.

ABOUT THE IEP UNIVERSITIES PROGRAM
APLU and its Commission on Economic and Community Engagement (CECE) established the Innovation and Economic Prosperity (IEP) Universities Program to help higher education institutions codify, elevate, and advance their campus enterprise supporting economic and community development.

The IEP designation program recognizes institutions that have demonstrated a meaningful, ongoing and substantial commitment to economic and community development, growth, and economic opportunity.

The IEP awards program recognize exemplary and innovative projects in university-based economic and community engagement:

- **Talent** and workforce development
- **Innovation**, entrepreneurship, and tech-based economic development
- **Place** development through public service, outreach, and community engagement

Learn more at: [www.APLU.org/IEP](http://www.APLU.org/IEP)