



IGNITE
VITALITY
Through Workforce Housing

3D HOUSE PRINTING
PRESS CONFERENCE
DECEMBER 13, 2022



3D house printing by sub-contractor Alquist 3D

COLLABORATIVELY EXPANDING THE SUPPLY OF WORKFORCE HOUSING IN MUSCATINE COUNTY
utilizing innovative tools such as 3D house printing





IGNITE
VITALITY

Through Workforce Housing

SPEAKERS



MARK LOFGREN
IOWA STATE SENATOR

Senator Lofgren is a native of Muscatine. His professional experience includes careers in both the real estate and investment industries, formerly owning and operating Lofgren Investments, and a real estate business. He served two terms in the Iowa House before being elected to the Iowa Senate in 2016. Senator Lofgren sits on the following State Senate committees: Economic Growth Budget Sub (Chair), Appropriations, Local Government (Vice Chair), Rules and Administration, Transportation, Veterans Affairs, and Public Retirement Systems. He has been a dedicated advocate for housing while serving in the Iowa Legislature.



PETE EVANS
ASSISTANT PROFESSOR, INDUSTRIAL DESIGN, IOWA STATE UNIVERSITY

Mr. Evan's teaching, scholarship, and research involves mixed reality (VR and AR) simulation; digital communications, prototyping and design; impacts of 21st-century skills on K-16 students and workforce; UXUI, human computer interaction, and human centered design. He also founded and coordinates FLEx (Forward Learning Experience) - a mobile design & STEM outreach program to include the development of NASA ISGC Grants for outreach.

ISU College of Design's 3D Affordable Innovative Technologies Housing Project received a \$1.4 million Strategic Infrastructure Program grant from Iowa Economic Development Authority to overcome the massive surge in pricing and demand for rural housing. Mr. Evans is leading this effort.



SANTOS SAUCEDO
BOARD OF SUPERVISORS, MUSCATINE COUNTY

Supervisor Saucedo has served as a Muscatine County Supervisor from 2019 to present. Prior, he was an elected official of the Muscatine City Council from 2015-2019. Supervisor Saucedo also holds the role of Senior Project Manager for Bayer, where he manages a variety of capital projects. He also serves area youth in a volunteer capacity as Director of Operations for the Muscatine County Boxing Club.

Supervisor Saucedo is a founding member of the Muscatine County Housing Council and is a consistent proponent of county-wide housing development.



JODI ROYAL-GOODWIN

COMMUNITY DEVELOPMENT DIRECTOR, CITY OF MUSCATINE

Mrs. Royal-Goodwin serves as the Community Development Director for the City of Muscatine, as well as the Executive Director of Muscatine Municipal Housing Authority. She previously served as Executive Director of Region XII Housing Authority in Carroll, Iowa, and the Housing and Community Development Director in Reno, Nevada. She serves in a volunteer role with the Muscatine County Veterans Affairs, Iowa League of Cities, and the National Association of Housing and Redevelopment Officials.

Mrs. Royal-Goodwin is a founding member of the Muscatine County Housing Council and is a dedicated voice to county-wide housing development and family stabilization.



CHARLA SCHAFER

PRESIDENT, COMMUNITY FOUNDATION OF GREATER MUSCATINE

Mrs. Schafer has served at the Community Foundation of Greater Muscatine since 2018. Prior, she held the role of Executive Director of Muscatine Center for Social Action from 2015 to 2018. Mrs. Schafer's career has also spanned more than two decades in various community banking capacities. She is active in various volunteer roles, including the Iowa Prevention and Research Center for Rural Health board.

Mrs. Schafer is a founding member of the Muscatine County Housing Council and is dedicated to collaboratively addressing the supply-side failure of housing. She looks forward to partnering to bring 3D housing to Muscatine County in 2023, as a supplement to traditional builds.



SCOTT DAHLKE

EXECUTIVE DIRECTOR, MUSCATINE CENTER FOR SOCIAL ACTION

Mr. Dahlke has served as Executive Director of Muscatine Center for Social Action (MCSA) since 2018. He served as the Program Manager for MCSA from 2016-2018. Previously he served in supervisory care coordination roles for the Robert Young Center, a regional behavioral and mental health provider. Scott sits on various local and state-wide boards, including Iowa Balance of State Continuum of Care.

Mr. Dahlke is a member of the Muscatine County Housing Council and is dedicated to family stabilization and the prevention of homelessness. MCSA was recently awarded a \$1.8 million dollar HOME grant in an underserved neighborhood in Muscatine that Mr. Dahlke will facilitate.



DR. NAOMI DEWINTER

PRESIDENT, MUSCATINE COMMUNITY COLLEGE

Dr. DeWinter serves as President of Muscatine Community College. Prior, she was Vice Chancellor of Student Affairs at North Central Michigan College, Petoskey, Michigan. She has additional experience at Oakland Community College, a large urban multi-campus system in the Detroit area. Dr. DeWinter is active in non-profit leadership roles, including service on various boards, such as LULAC and Rotary International. She also serves on the national board for the Doctorate of Community College Leadership program at Ferris State University (MI).

Dr. DeWinter takes an intersectional view to solving community-wide issues, and helps to engage staff and students in meeting the most pressing needs.





CLINT CHRISTOPHER
SUPERINTENDENT, MUSCATINE COMMUNITY SCHOOL DISTRICT

Mr. Christopher has served as Superintendent of the Muscatine Community School District since 2020. Prior, he served in a similar role in Eastern Carver County Schools in Minnesota for six years. He has also served in the Moline and North Scott School Districts. He serves on various local and state-wide boards, including the Board of Trinity Muscatine Hospital.

Mr. Christopher is focused on the collective vision of ensuring success for his students. The availability of quality housing and housing choice is a key component to both the stability of the child and the opportunity to attract and retain teachers and staff.



DR. BRAD BARK
MAYOR OF THE CITY OF MUSCATINE AND PRESIDENT & CEO, GMCCI

Dr. Bark serves as the Mayor of Muscatine and the President of the Greater Muscatine Chamber of Commerce & Industry. He has also served as Community Initiatives Director for the Community Foundation. Prior, Dr. Bark successfully served the Muscatine community as a doctor and owner of Bark Chiropractic. He serves on a host of civic committees and local boards.

Dr. Bark is a member of the Muscatine County Housing Council and recognizes the significant impact housing has on the vitality of the Muscatine community and supports action through both of his roles as Mayor and at the Chamber.



DON LAMPE
PRESIDENT, MUSCATINE COUNTY HABITAT FOR HUMANITY

Mr. Lampe serves as the President of Muscatine County Habitat for Humanity in a volunteer capacity. Prior, he served in senior roles at HNI and HON, as well as Vice President at Vision Trust International. His last role before retirement was as Operations Manager at Temp Associates. Mr. Lampe is also part of a non-profit collaborative working collectively to address quality housing development for low to moderate income (LMI) households.

Mr. Lampe is committed to serving the needs of income-constrained families in Muscatine County through Habitat for Humanity modeling and resources.



ZACHARY MANNHEIMER
FOUNDER & CEO, ALQUIST 3D

Mr. Mannheimer serves as founder and CEO of Alquist 3D, an Iowa-based company, on the cutting edge of 3D house printing. Alquist printed the first owner-occupied 3D home in the world in 2021. Prior to his work at Alquist, he and partners launched Atlas Community Studios, a creative placemaking firm. Mr. Mannheimer currently resides in Iowa City, and has been named 2011 Des Moines Citizen of the Year, Des Moines Business Record's 40 Under 40, and DSM Young Professional of the Year, as well as receiving the Iowa Governor's Volunteer Award.

Mr. Mannheimer and Alquist 3D plan to work with local partners to build the first 3D printed home in the state of Iowa in Muscatine in 2023.



ABOUT 3D HOUSE PRINTING

Building System

- The homes are printed by a robotic arm that moves on rails and prints the house layer by layer from the ground up.
- This makes it easy to create curved walls – giving 3D houses their signature look.
- Muscatine homes would be printed on site, although it is possible for 3D printers to create prefabricated walls in factories and transport them to the home site.
- 3D homes are based on a design plan that is uploaded from a digital file. The 3D printer creates a blueprint of the object's design from computer-aided design software and follows the design as it prints.
- 3D printed homes use less manual labor, increasing safety on the job site.



3D printed house by sub-contractor Alquist 3D

Building Materials

- 3D homes are printed with a concrete mix called "crete."
 - This concrete mix makes houses incredibly durable and less vulnerable to the elements than stick-build homes. For example, they have the ability to retain temperatures and withstand natural disasters better than a stick-build home.
 - The compression of a 3D home lowers utility costs.
 - Concrete is more resistant to aging issues (such as mold, mildew, insects, etc.).
 - Muscatine Community College (MCC) has the only HEMP program in the state of Iowa. They will utilize this program to research the potential of creating a hempcrete mix to print houses, allowing materials to be locally sourced and creating a more environmentally friendly mixture.
 - Concrete production is responsible for 8% of global carbon dioxide emissions, according to Chatham House.
 - Hempcrete is a net carbon-negative material, which can provide major environmental benefits.
 - Hempcrete has excellent fire resistance and thermal insulating properties that can reduce heating and cooling energy demands.

Building Timeline

- The base of a 3D printed home is constructed in 12 days or less.
 - (Alquist 3D has done it in as quick as 28 hours).
- Finishes (i.e., roofing, plumbing, electrical, etc.) takes 6-10 weeks.



3D house rendering by sub-contractor Alquist 3D

Building Timeline

- Conventional manufacturing leads to significant amounts of waste – for every one pound used, 30 pounds of waste are created.
- Leftover crete mix can be used at the next worksite, eliminating unusable trimmed building materials.
- 3D printed homes are energy efficient, reduce utility bill costs, and minimize negative environmental impacts.



Building Cost

- 3D printing technology costs an estimated 20-40% less to build a home than a traditional stick build.
- An Alquist 3D printed home in Virginia is estimated to have saved 15% per square foot in building costs.
- A 3D printed home can reduce labor costs by up to 80% – finishings still require manual labor.
- Because homes are made of concrete, the costs of storing and transporting building materials are nearly eliminated.

Why This Matters to Muscatine / Muscatine County

- Improving the housing stock is one of Muscatine's largest opportunities for improvement. A large shortage of affordable housing is burdening residents, increasing home and rental costs, and creating economic ripple effects in residents' lives. Rural areas often attract less developers, leaving Muscatine overlooked by large-scale development.
- Muscatine has a need for housing from entry level to executive.
- 62% of those employed in the City of Muscatine live elsewhere, according to 2019 U.S. Census Data.
- Total active listings in Muscatine have dropped every year for three years, while the total number of homes sold has increased in the same period.
- Muscatine's population growth was at or below 1.5% from 1980 to 2015.



Demographics for Muscatine / Muscatine County

- County income: \$60,435 median household income; \$30,902 per capita income
- City income: \$53,768 median household income; \$27,426 per capita income
- 26% of Muscatine County residents rent; 34% of City of Muscatine residents rent
- There is a high demand for ranch-style homes in Muscatine according to local realtors; they are the fastest to leave the market because they appeal to all buyers.
- 3D houses have promise for seniors because of the low-cost maintenance and accessibility.

3D



MUSCATINE COUNTY

For more information and additional press facts, visit
www.givinggreater.org/housing.

