

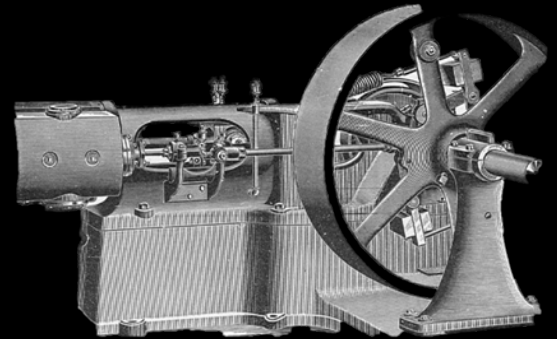


Automated Construction by CONTOUR CRAFTING

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The ability to build - the major driver for advancement of human civilization





Fabrication methods



Subtractive

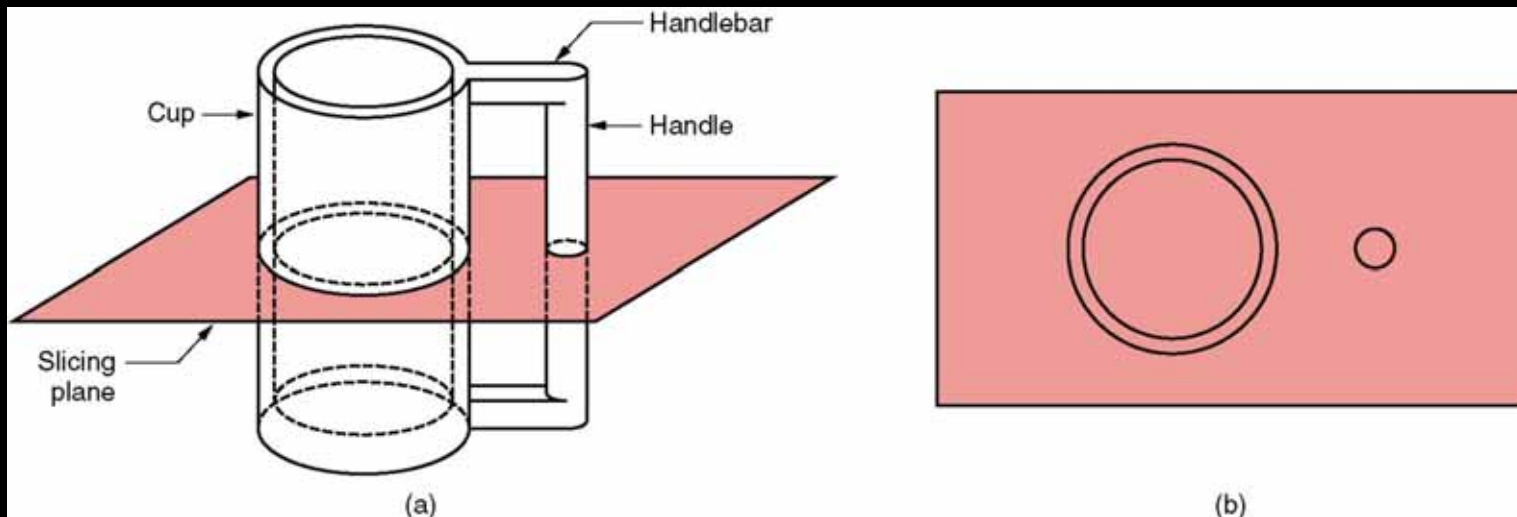
Additive

Formative



Additive Manufacturing; 3D Printing

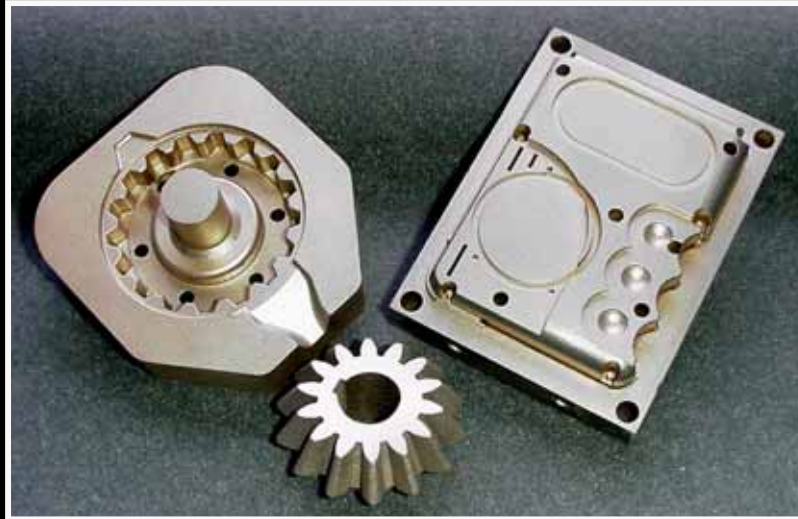
Principle: Add 2D layers of material one at a time to build the solid 3D part.





Sample parts made with different AM technologies

SLS



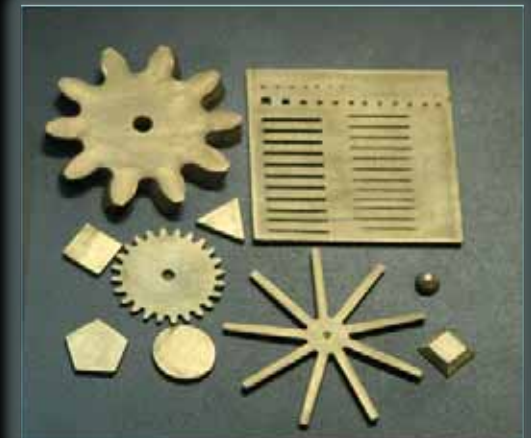
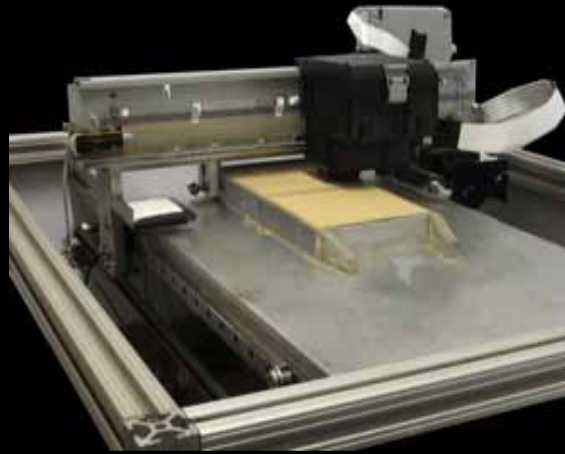
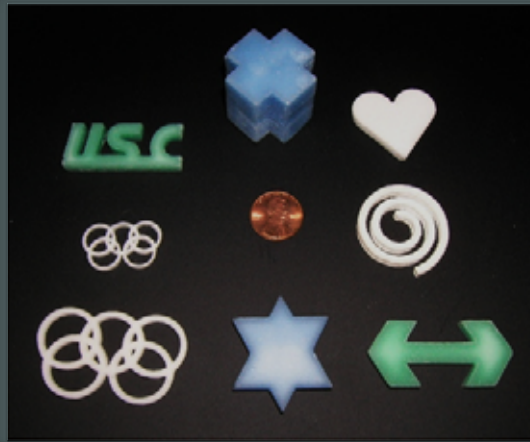
FDM

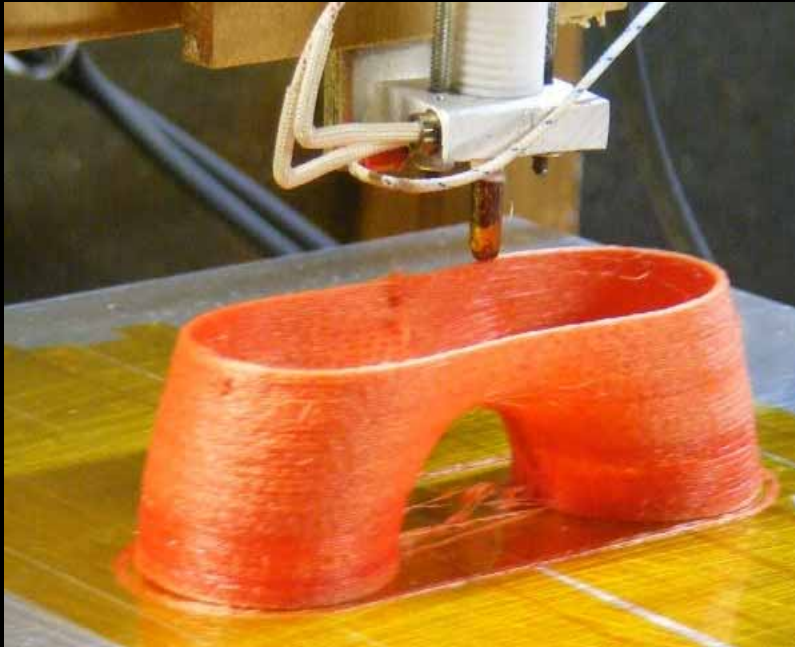
SLA



3DP

SIS family of AM technologies







2 billion people live in slums





Nearly 40 million people lose their homes each year

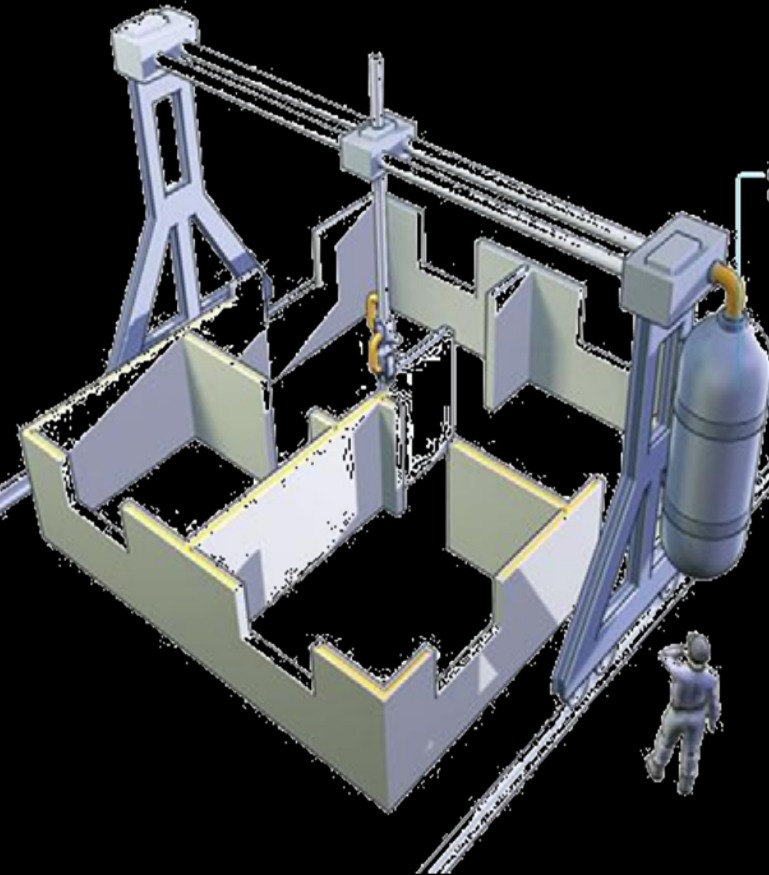




The Solution

Benefiting from advanced manufacturing technologies to build:

- with unprecedented architectural features
- at a fraction of the cost
- at a fraction of the time
- far more safely
- far less damage to the environment
- far less logistics and project management problems





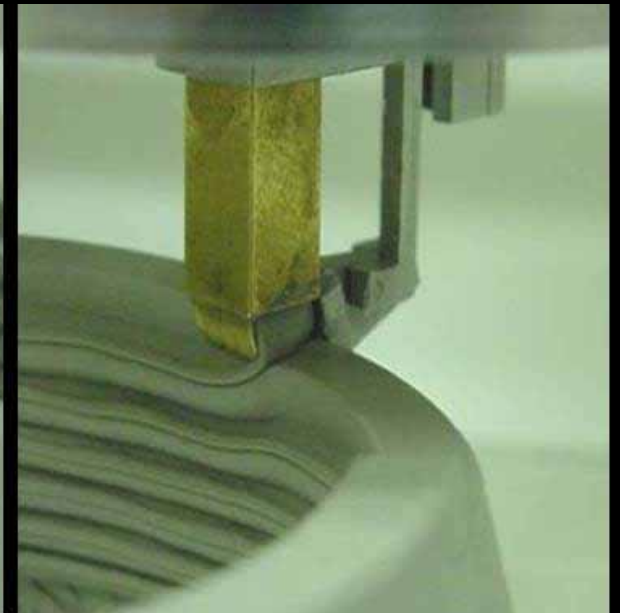
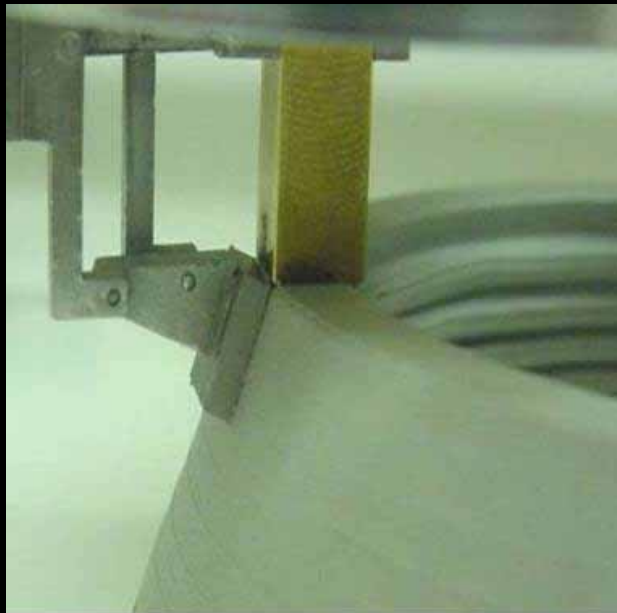
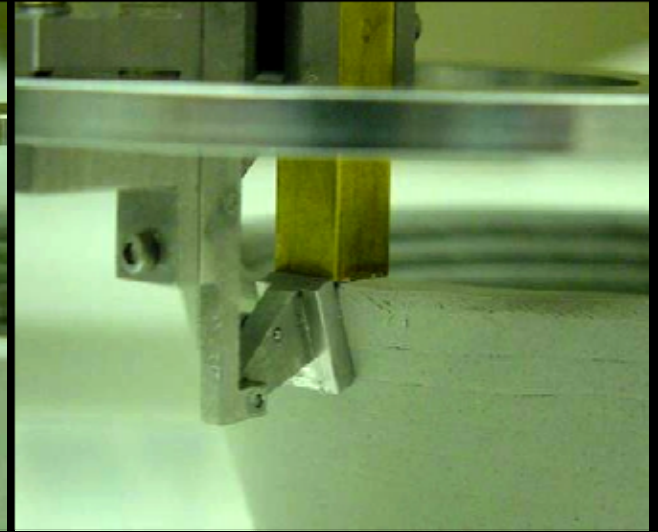
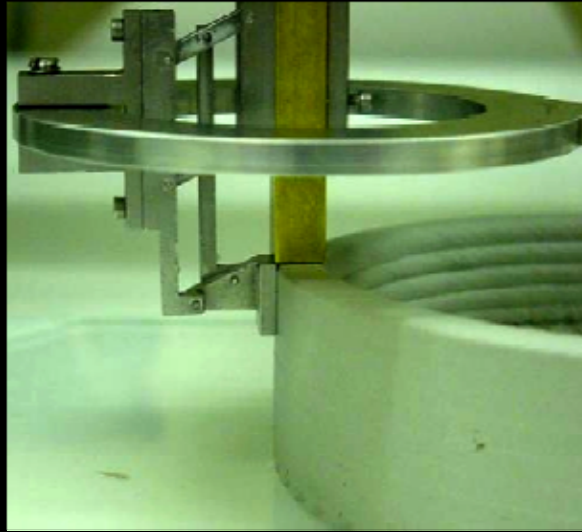
The Result

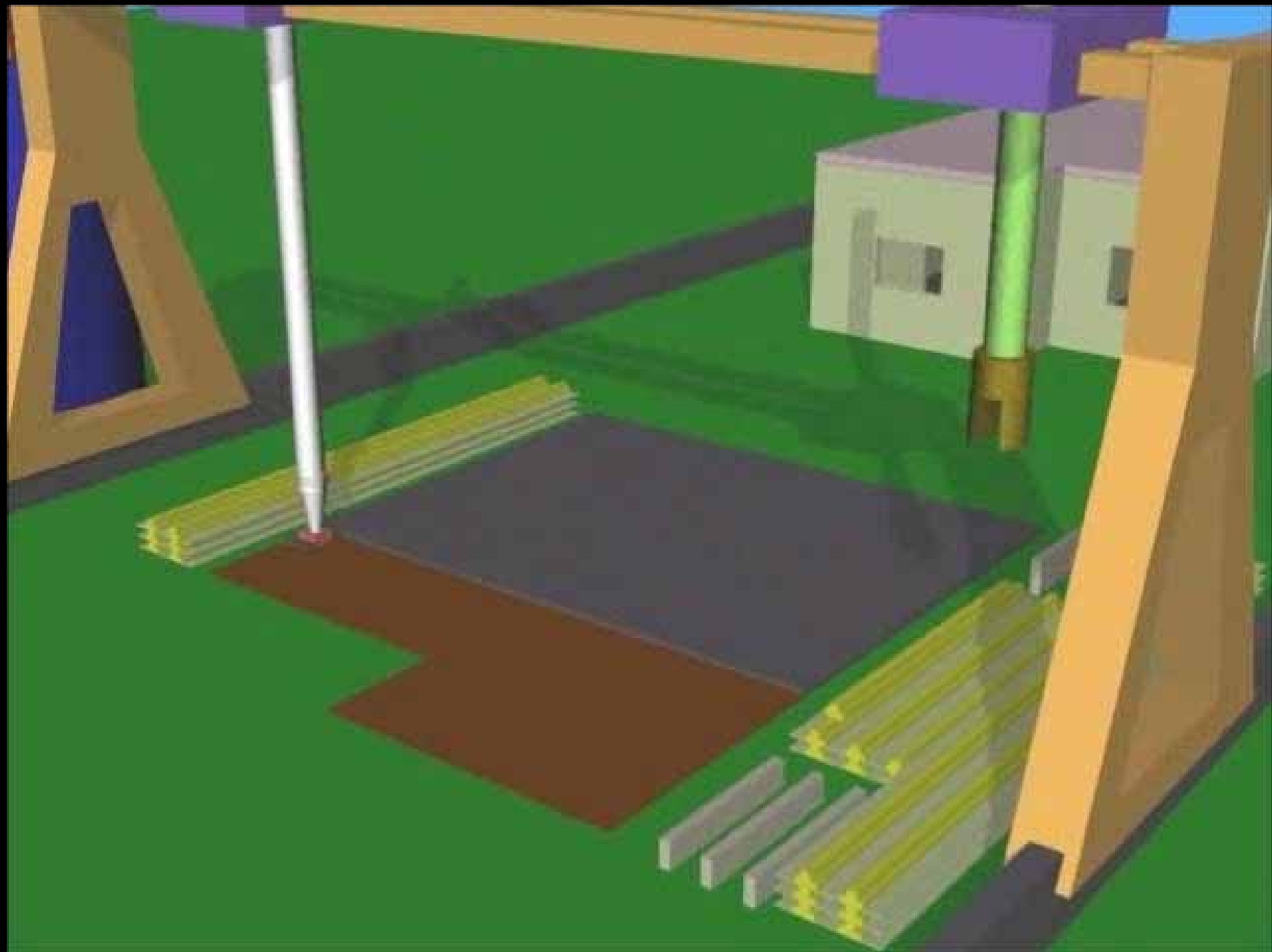


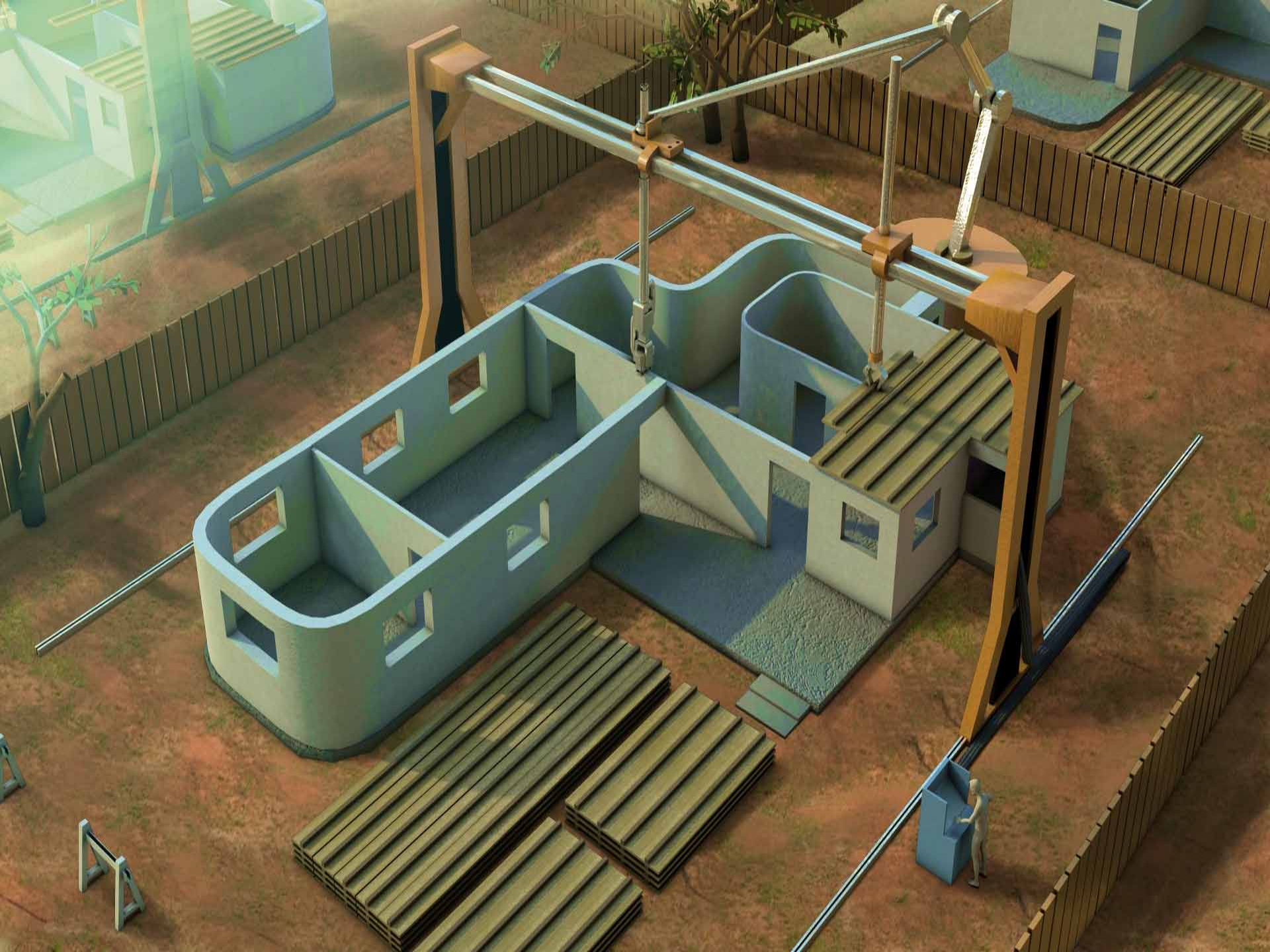


What is Contour Crafting?

CC is an extrusion based layered fabrication technology that builds objects with successive “thick” layers as it smoothens out external surfaces









CC Nozzle assembly



Monolithic hollow walls



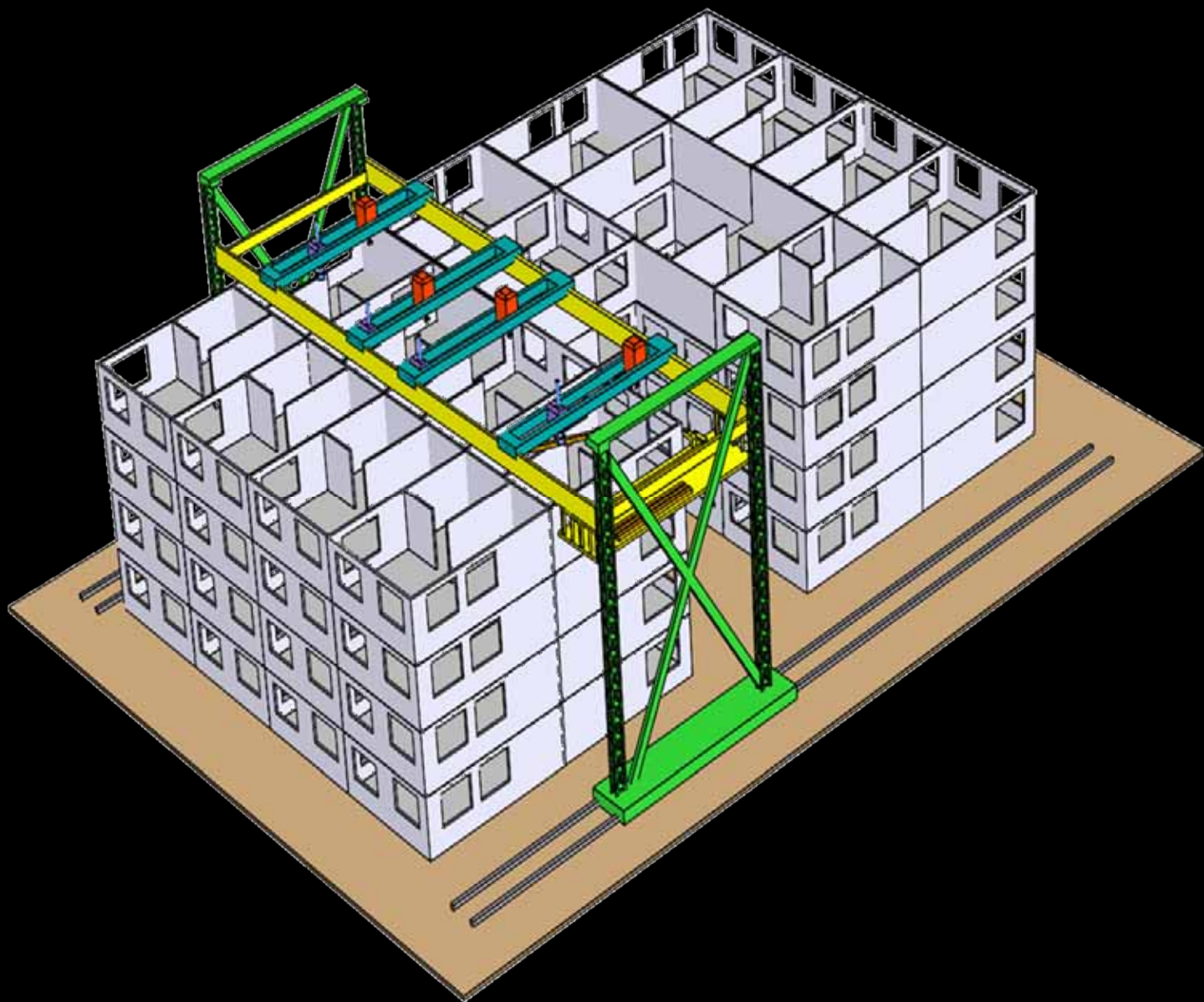
Strength of a 4-layer section

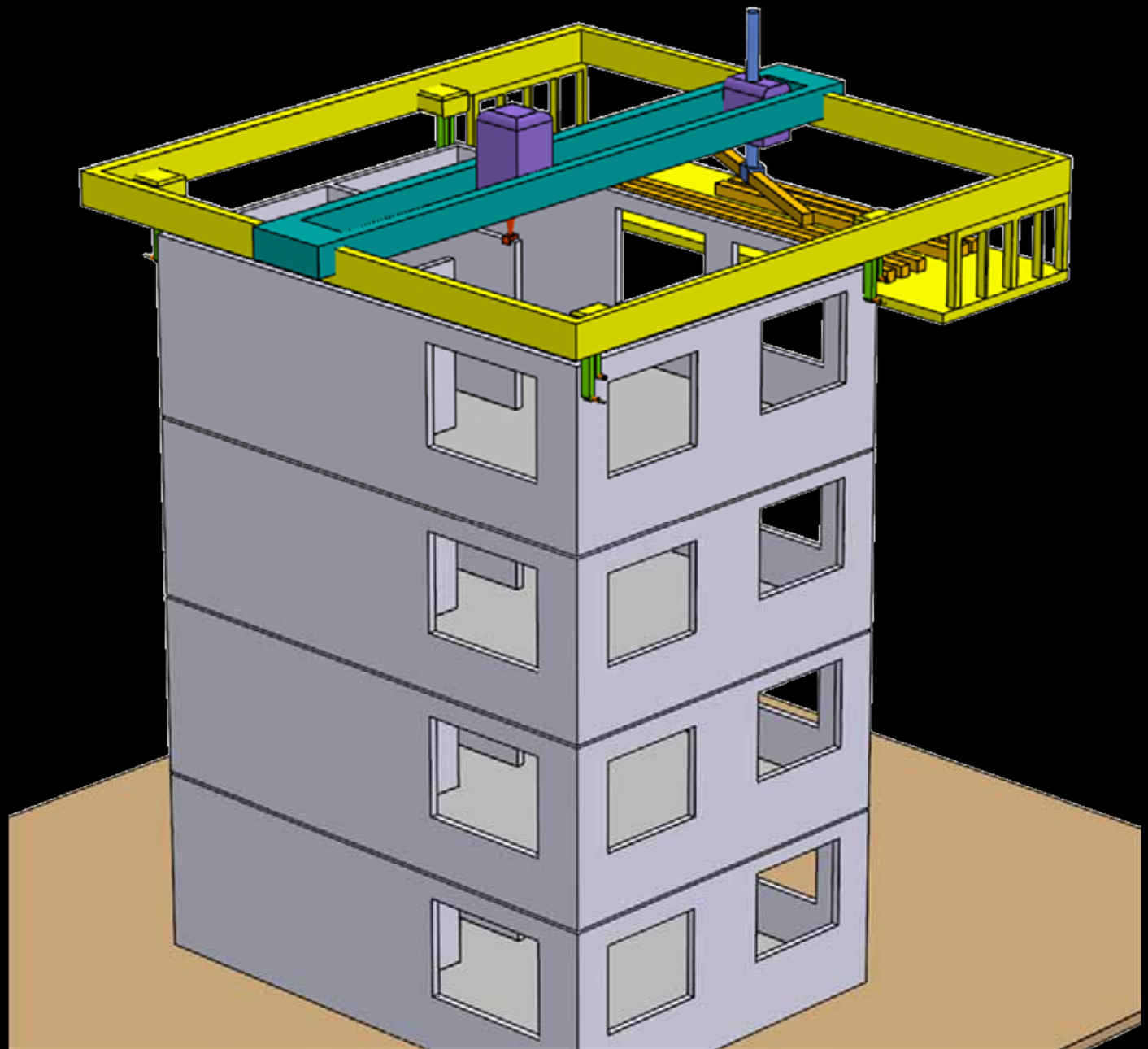




Largest 3D Printed structures

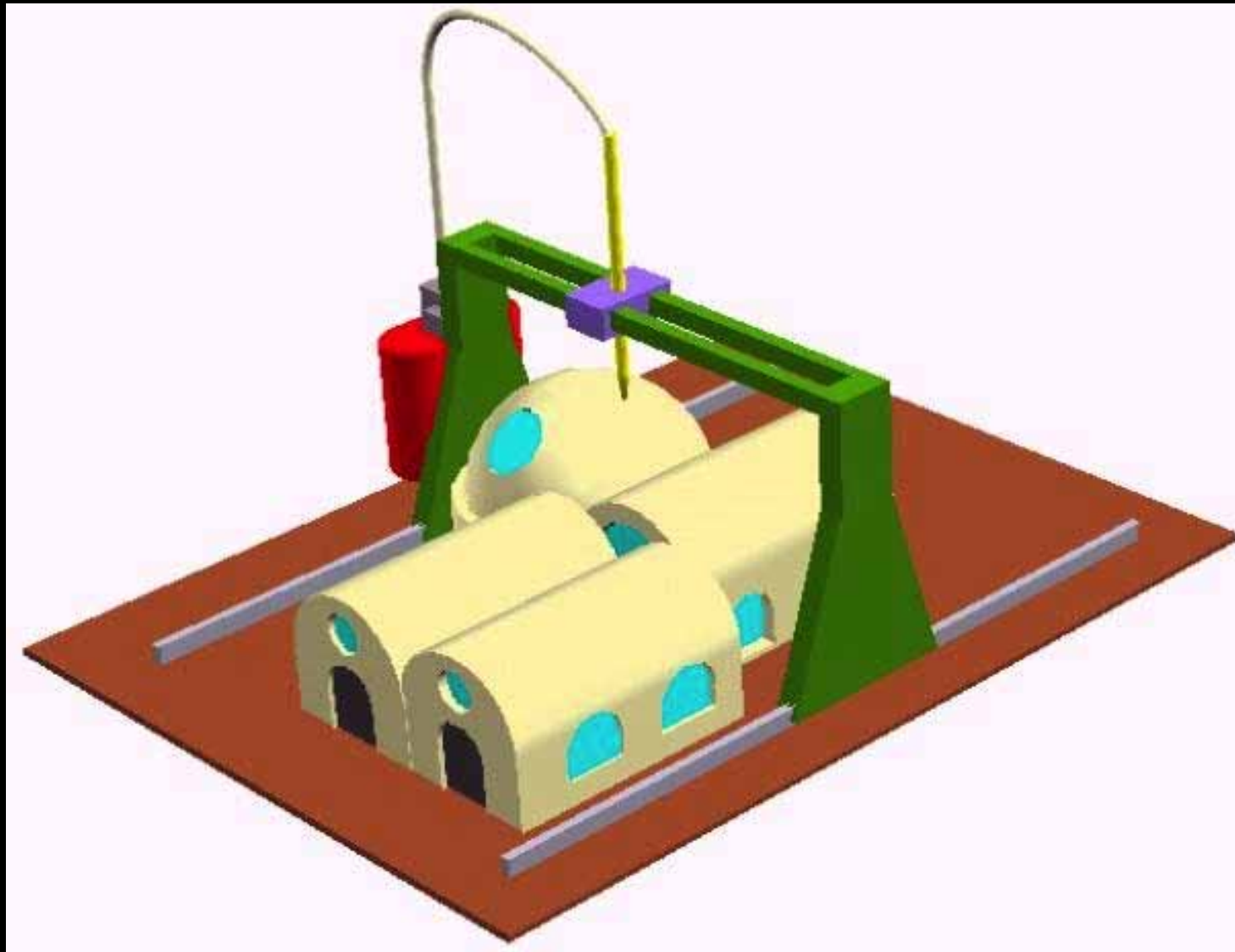








Adobe house Construction with In-situ materials





Adobe structures – Ageless comfort and beauty

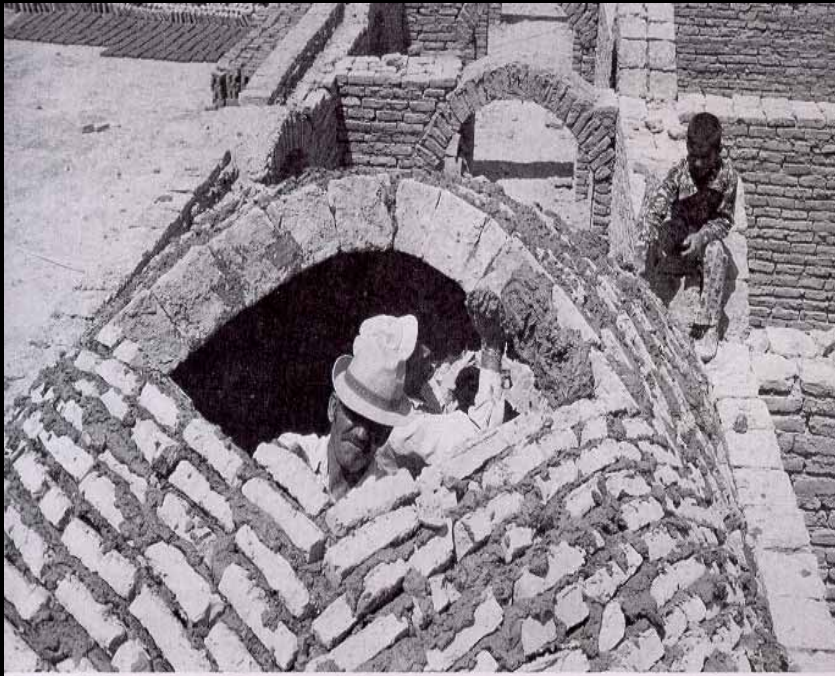


House of
Brojerdi
Kashan

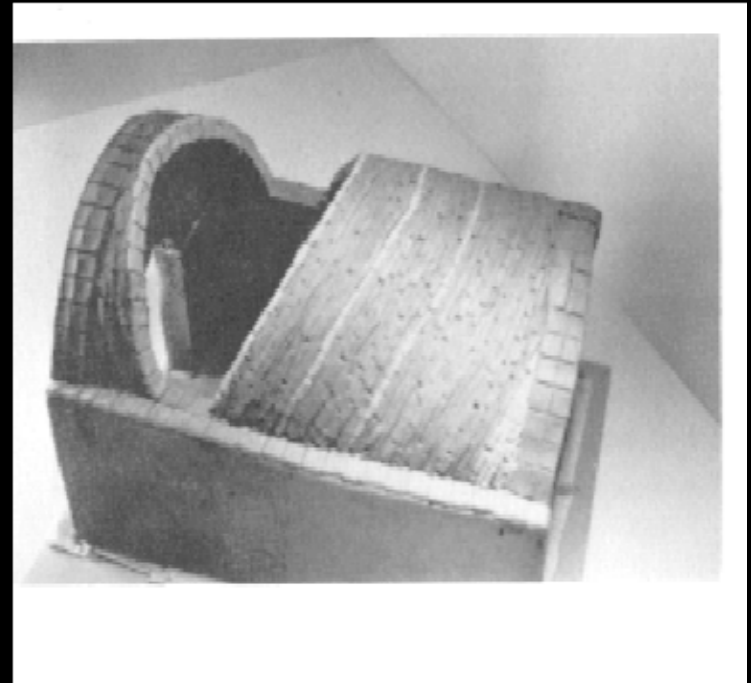


Interior of an
Adobe house
CalEarth Design

Ingenious methods

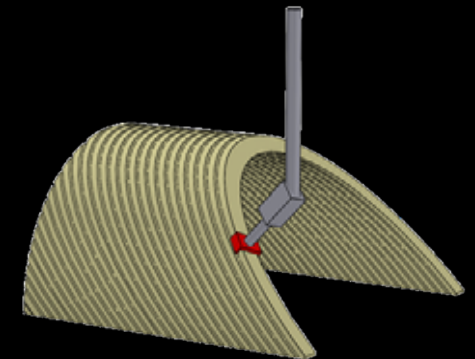
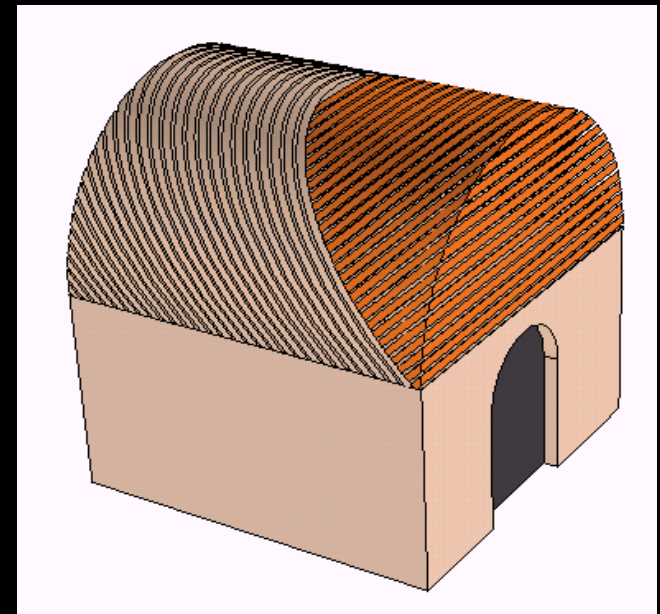
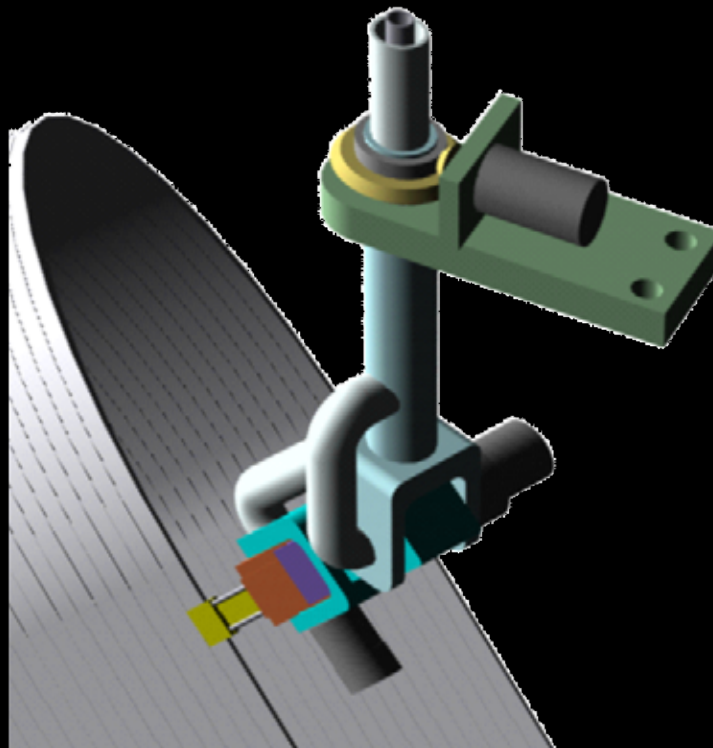


Manual construction of adobe form structures using clay bricks (Source: Khalili, 2000)



A vault structure made of clay bricks (Source: Khalili, 2000)

Implementation by CC



CBRNE Collective Protection Shelters



Current rapid
deployment shelter
choice

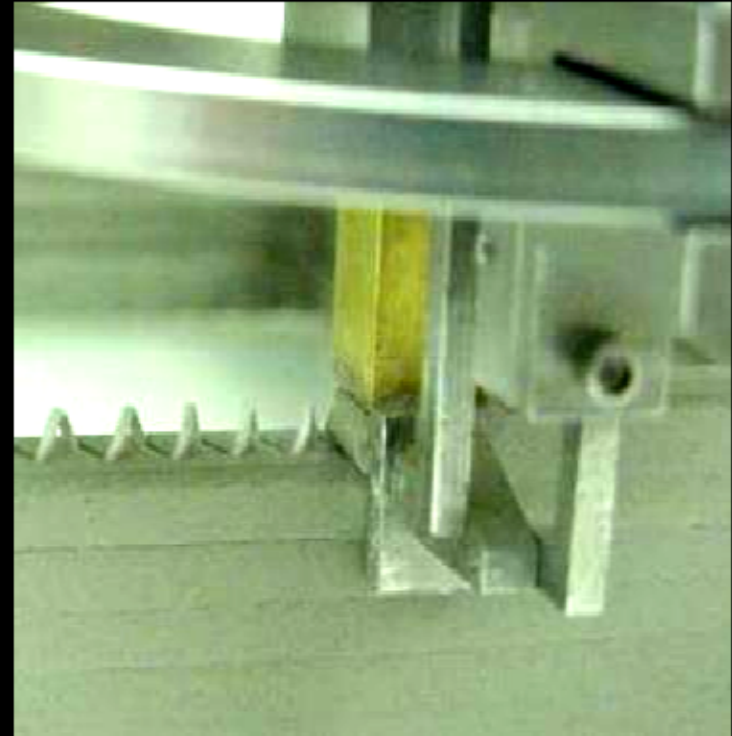


The CC choice: Protection against
Chemical, Biological, Radiological, Nuclear and Explosives



Automatic imbedding of reinforcement and heating / cooling elements

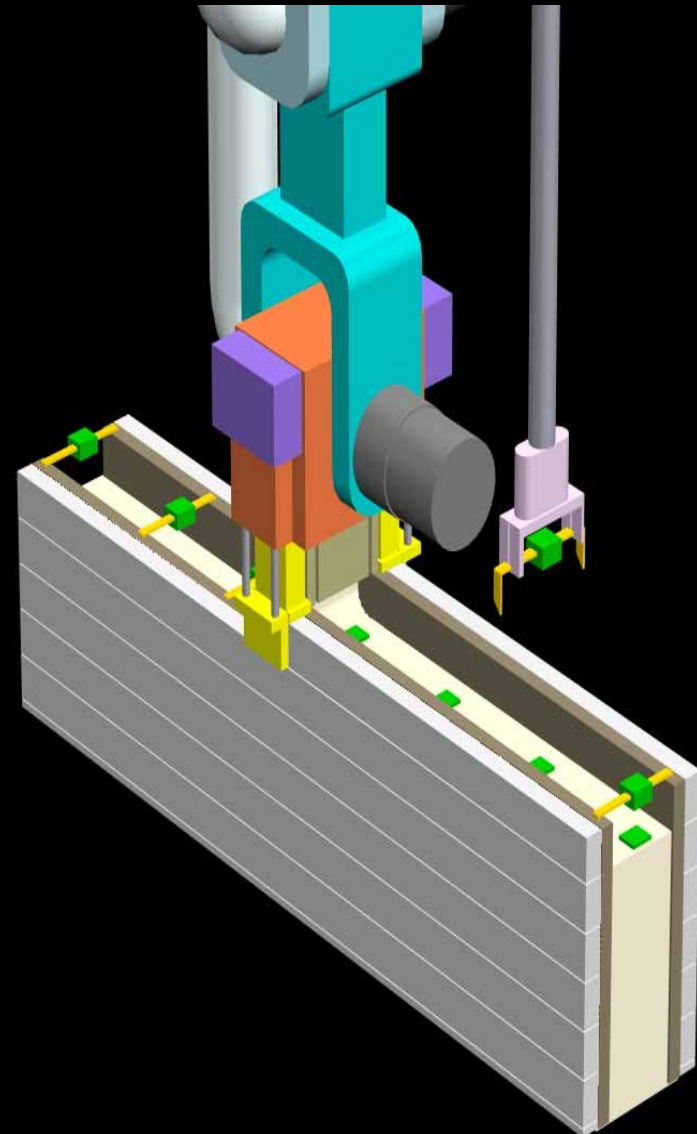
Steel, nichrome wire coil or copper pipe for reinforcement, or carrying heating or cooling fluids may be automatically imbedded upon construction.





Imbedding sensors and IT components

Conductive concrete may be used to power densely imbedded sensors and actuators.



Green Lighting

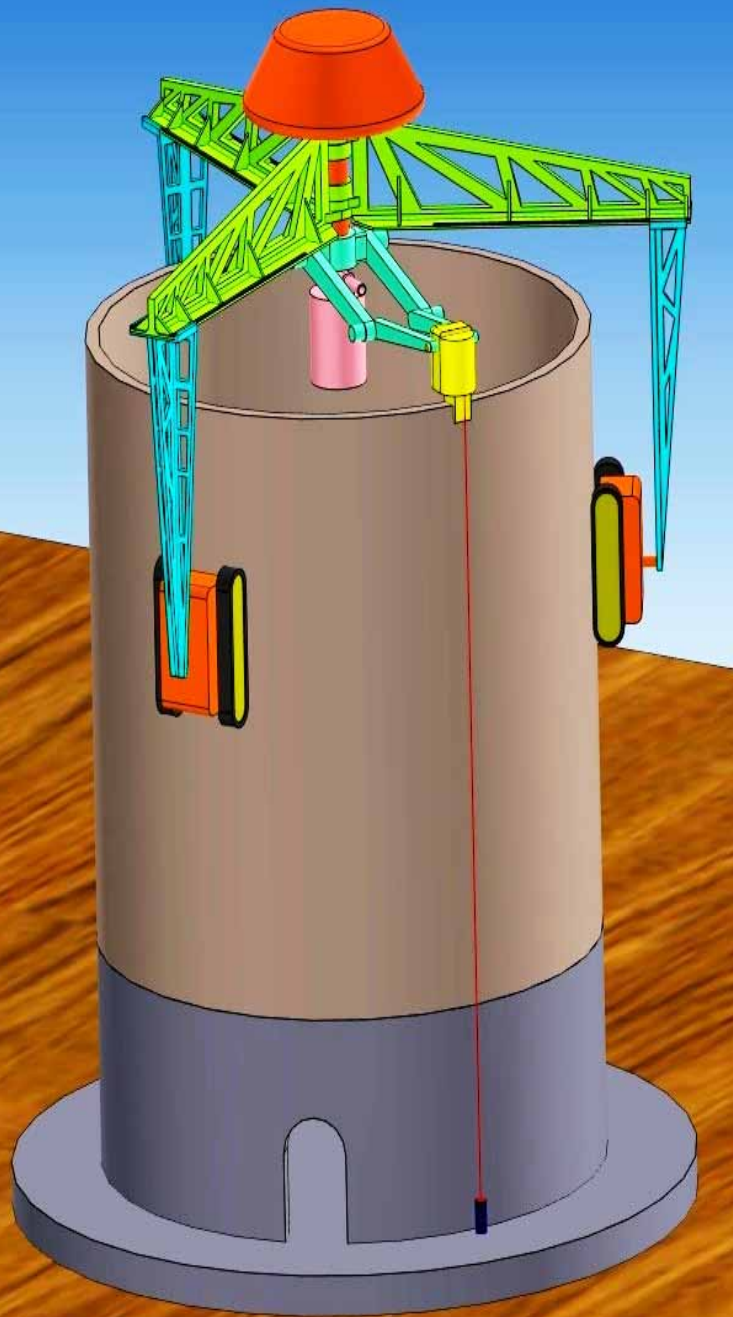


Permanently imbedded lighting by extruding LEDs with conductive and translucent concrete to create building structures that provide reliable and low energy consuming illumination.



Wind turbine tower construction



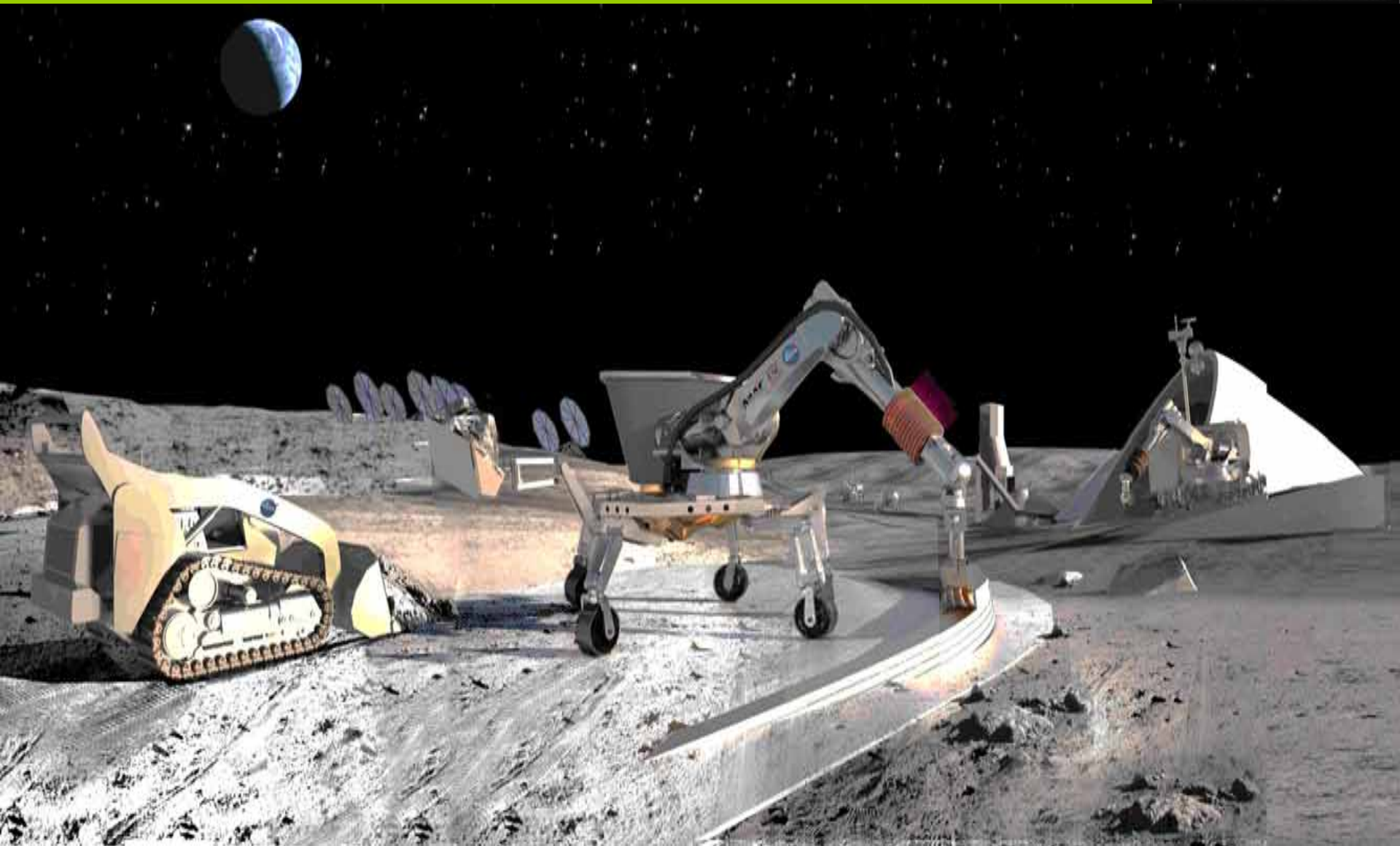




Physical simulator



Planetary construction by CC



Planetary construction by CC





Lunar structures





Building with Martian material





USC CRAFT

Center for Rapid Automated Fabrication Technologies

A Custom House in a Day

Grand Challenge

Industrial Parts
& Molds

Freestanding Objects

Extraterrestrial
Construction

Architectural
Scale Models

Public Art

Economic Impact

Environmental Impact

Architectural Impact

Social Impact

Regulatory Impact

Employment Impact

