**Casa Covida**

*Casa Covida*, a house for co-habitation in the time of covid, is an experiment in combining 3D printing with indigenous and traditional building materials, methods with employing new and ancient ways of living. The experimental case-study house is sited in the high alpine desert of Colorado’s San Luis Valley, where *adobe*, a combination of sand, silt, clay, water and straw that is dried in the sun, and is the traditional building material of the region. The house is comprised of three spaces, each for two people to sleep, bathe, and gather around fire and food, and the spaces have openings to the sky, the horizon, and the ground. The central space contains a hearth surrounded by two *tarima*, or earthen benches, covered with woven textiles. 3D printed cookware crafted using regional micaceous clay reminiscent of traditional New Mexico Pueblo pottery, can withstand the heat shock of the hearth, to cook locally grown beans, corn, and chiles.

The sleeping space is built of a platform constructed of locally harvested beetle kill pine covered with sheep skins and woven churro wool blankets and cushions designed in collaboration with a local weaver. Views to the landscape and the sky are framed by the adobe oculus. A light weight, pneumatic roof, an ephemeral and synthetic addition to the structure that appears like a blooming cactus, can shelter the oculus from the occasional rain or snow in a landscape that with an annual participation of only 228mm of rain per year, and also keep in heat from the hearth. The bathing space is filled with ancient waters from the deep aquifer below this mountain desert landscape and the retention of heat is provided by the ground. Tumbled river stones surround the bath and bathers can view the sky. The door handles to *Casa Covida* are fabricated by 3D Printing a master that is then cast in the same adobe mixture used to fabricate the building, and when dry, the bio-plastic master is burnt out and cast using aluminum from cans found along the desert roadside. Doors and lintels are also locally harvested beetle kill pine, treated by flame-charing the exterior.

The 3D printing system combines a portable 3-axis SCARA (Selective Compliance Articulated Robot Arm) purpose built for on-site additive manufacturing that can construct structures larger than the printer itself, with a continuous flow, and stator driven mortar pump that delivers adobe material to the nozzle. In constructing *Casa Covida*, a 4th axis rail which creates a rigid structure upon which the printer was moved after each printing session of approximately 400mm in height. The deposited adobe material is allowed to dry and harden in the sun and wind. The printer can be easily carried by two people and can be operated entirely by as few as one person using a cell phone that controls the printer. Mixing is and sifting the earth mixture is done manually but assisted by a mortar mixer. The design files are created by a robust software application that grows from Potterware, a ceramic 3D printing software developed by Emerging Objects, which was a by-product of the architectural aspirations for printing with clay.

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MORE INFO: Emerging Objects ([www.emergingobjects.com](http://www.emergingobjects.com)), 3D Potter ([www.3dpotter.com](http://www.3dpotter.com)), Elliot Ross ([www.elliotstudio.com](http://www.elliotstudio.com))