

M-Power

Modular Solar Housing for Migrant Farmworkers

CONCEPTUAL DESIGN



Design Concept

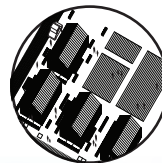
Conceived at multiple scales, the M-Power home reflects multiple design imperatives: a ZNE home that meets an affordable price point and respects the workers it is intended to house, as individuals and as a community in transit and in transition.



SIMPLE BARN
FORM



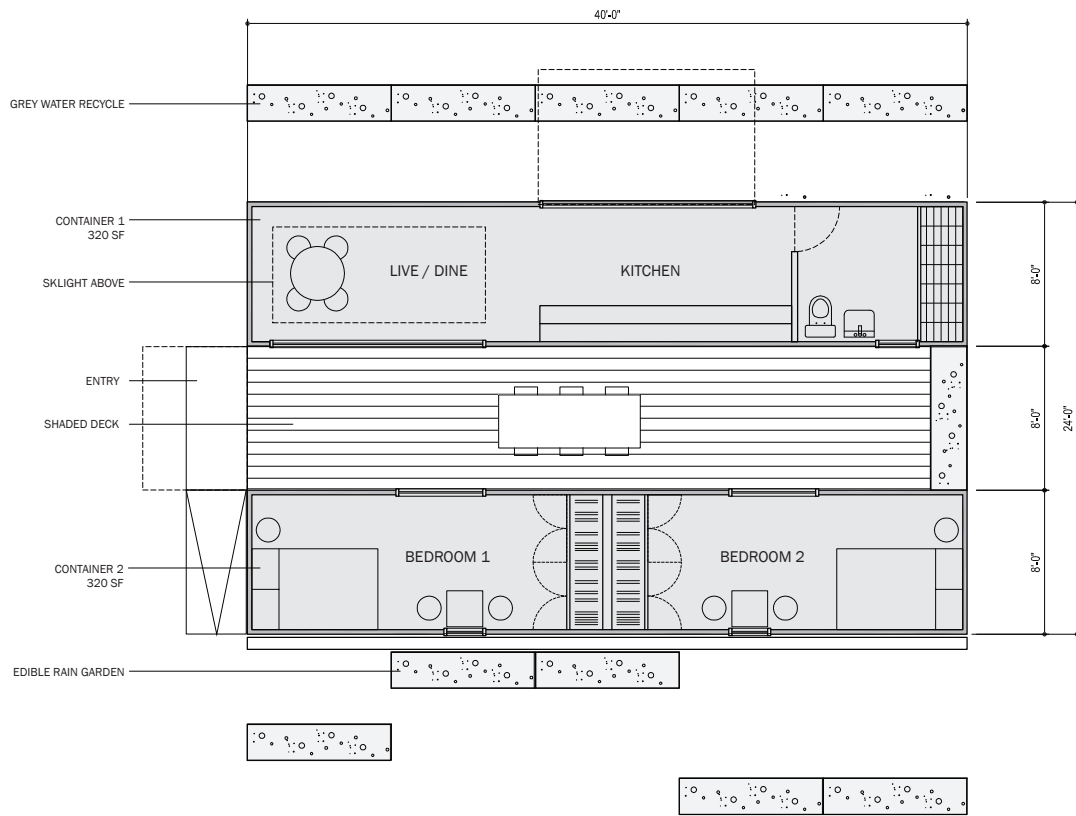
ACTIVE + PASSIVE
TECHNOLOGIES



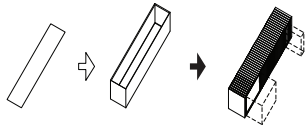
EMPOWERING
COMMUNITIES

Some argue that new technologies require new forms. Our proposal questions this: our massing will look much like the simple, functionalist barns of rural America. By upgrading these forms with both active and passive technologies through a combination of details and strategic juxtapositions, we aim to create communities that have minimal energy requirements as a starting point.



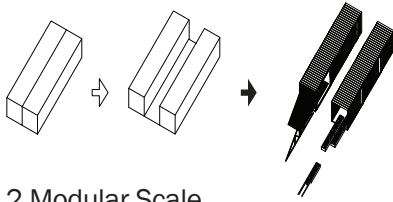


1 PLAN



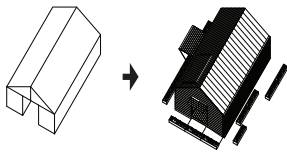
1 Foundation

A modular multiple-scale approach creates a flexible, user-centered environment. The design exploits shipping containers' standardization and ready availability, for an efficient foundation. These low-cost structures enable technology investments and integration with both the landscape and the project's intended community scale. Individual containers are cut to create openings that anticipate specific adjacencies. Semi-public spaces, such as kitchens, are aligned with public spaces, such as personal engineered-wetland gardens.



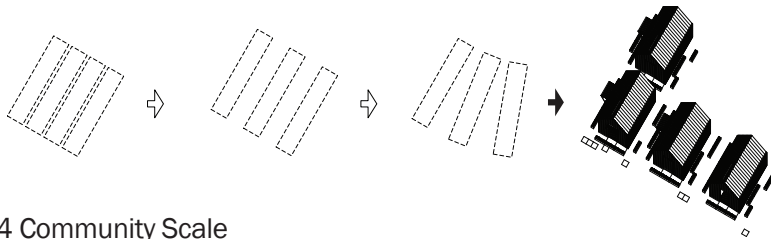
2 Modular Scale

Two 40-ft containers combine to create a basic 640-ft² unit with a "bonus" gap in the middle, creating a 960-ft² footprint. This gap adds usable space that doesn't contribute to the heating and cooling load. Outdoor space is captured, creating a sense of ownership and community. Each residence strategically combines high and low technology. Simple technologies (such as sun-shading devices and graywater recycling) are combined with cutting-edge energy management, which adjusts energy use to daily and seasonal rhythms.



3 Unit Scale

The basic unit form adopts the farmhouse typology to refer to existing and traditional built environments. The container-based solution can be sited as a fixed dwelling for a mobile population, or it can be moved, locally or regionally. Locally, housing can be moved to support rotational crops. Regionally, the movable design can double as storage. Small-scale "sub" units can accommodate workers' property.

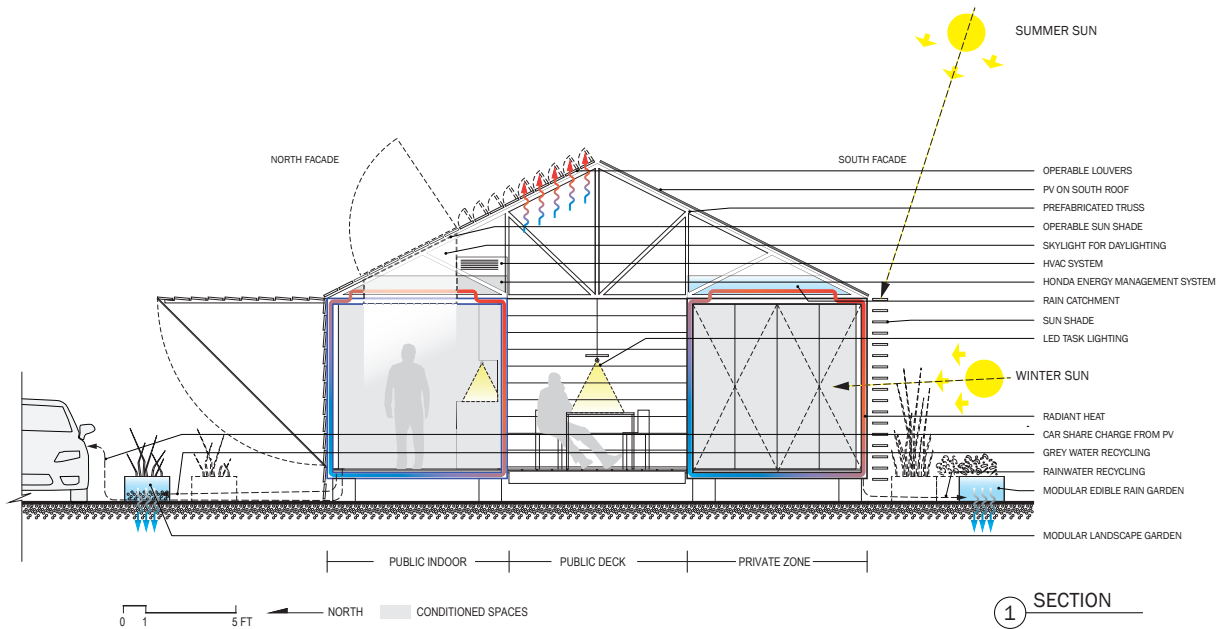


4 Community Scale

At the community scale, units are distributed to maximize their relationship to existing infrastructure and natural conditions: creeks, paths, bus routes, and connections to existing communities. The units themselves are open to community-scale connections. The containers' standard size allows for easy planning, zoning, and distribution for dense, medium, and open configurations.



The M-Power dwelling combines public and private spaces in three linear zones. Two climate-controlled living spaces are separated by a shaded deck. These three zones act as climate buffers, maximizing cooling in summer months and heating in winter. The units act as a system, combining active and passive techniques of energy efficiency. The home's passive components allow maximum user adjustability, while active components adjust energy to individual users' needs, learning from their daily rhythms.





We propose a combination of re-usable structures (shipping containers), prefabricated components (e.g., the truss roof), and locally available materials, such as soil for the modular edible gardens. All components are designed to fit inside the two shipping containers, enabling the units to be moved with minimum effort or additional materials. Units can remain sited or be transported seasonally.

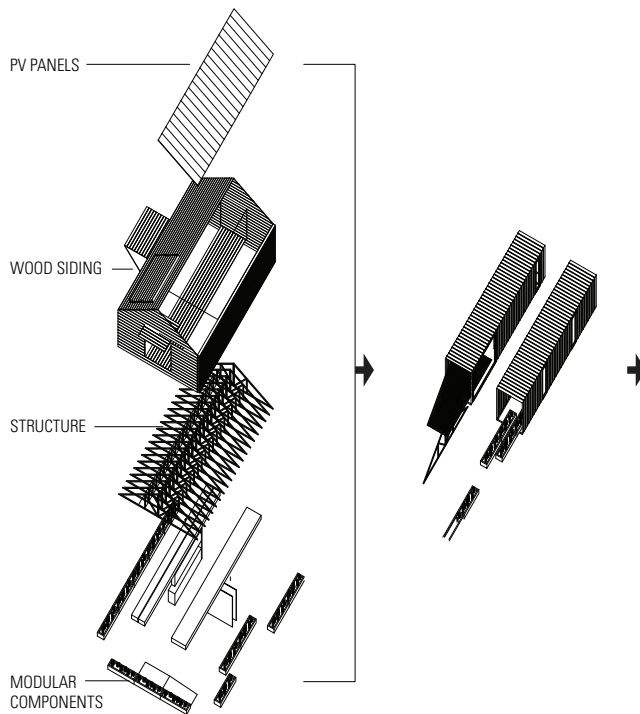


image source: <http://www.solidsonline.com/articles/201-High-Speed-Container-Shipping-by-Rail-Freight-Route>

