Reusable emergency shelters

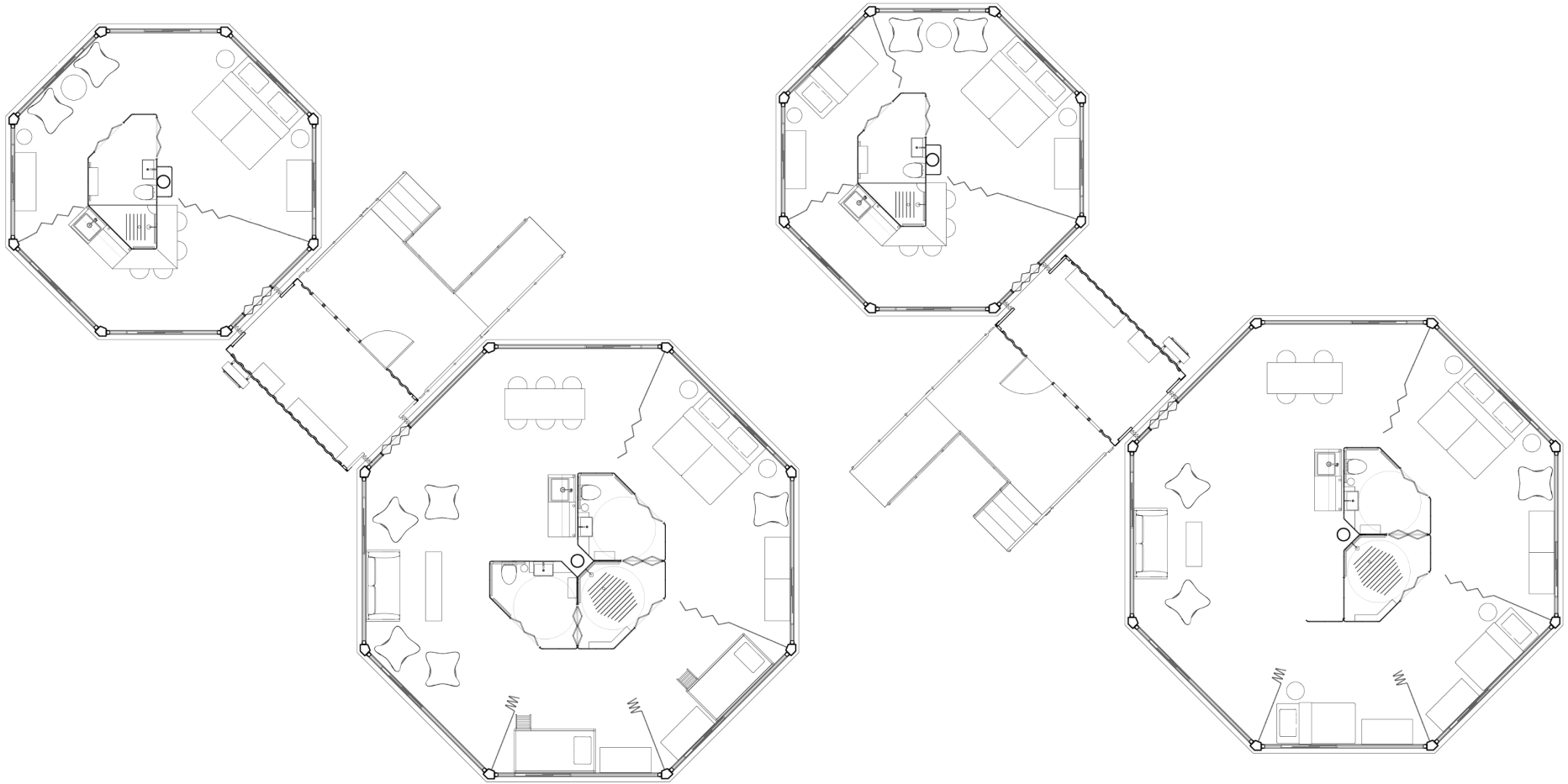
-An interdisciplinary emergency response proposal

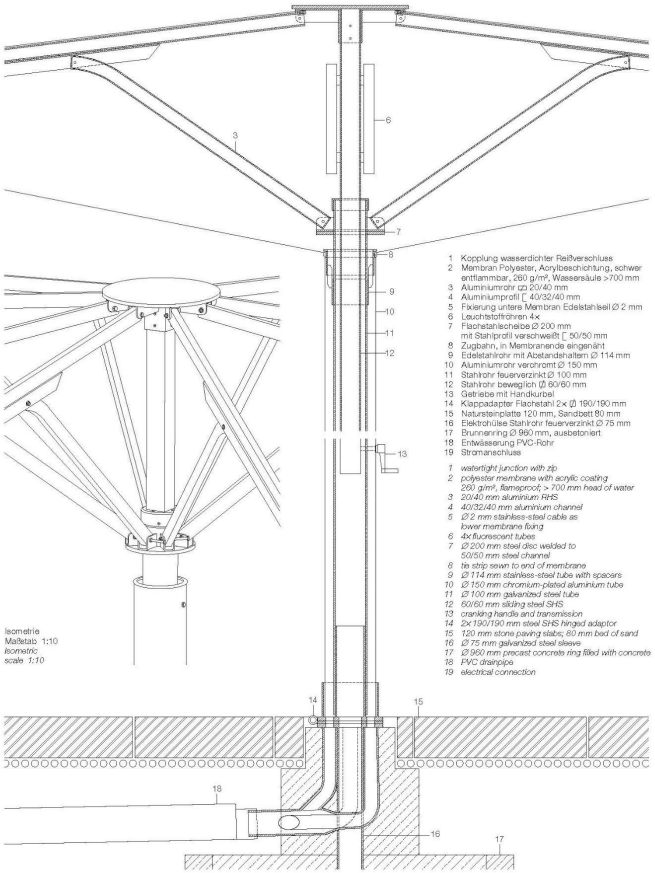
An interdisciplinary course with an accompanying exhibition- architecture, interior design, industrial design students at Pratt.

We analysed the growing number and intensity of natural disasters, the toll each takes, where they frequently occur, how various countries have approached the necessary damage control. In collaboration with FEMA (Federal Emergency Management Agency), fabricators, we designed a community housing disaster victims that could be installed within a week's time, support community needs, remain in a place for 18 - 30 months.The housing can be easily adjusted for changes in family structure. Once vacated, the structures can be dismantled and stored for future use.

Emergency housing shelter exhibit at Pratt

Housing Modules

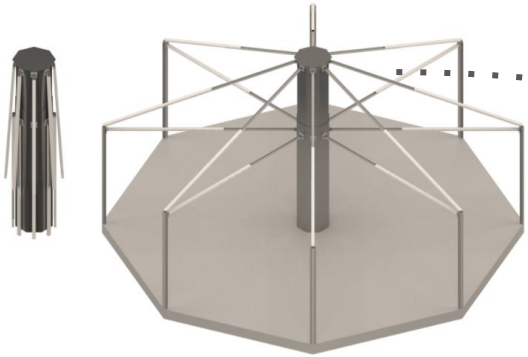


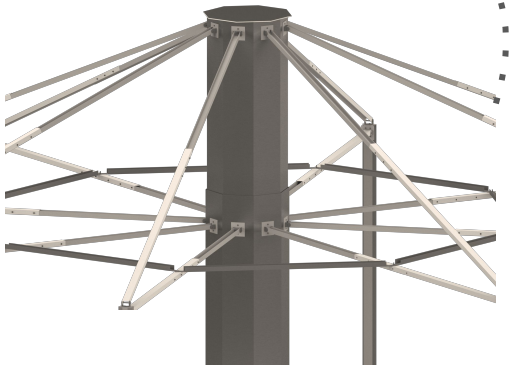


1 Kopplung wasserdichter Reißverschluss
2 Membran Polyester, Acrylbeschichtung, schwer entflammbar, 260 g/m², Wassersäule >700 mm
3 Aluminiumrohr □ 20/40 mm
4 Aluminiumprofil [40/32/40 mm
5 Fixierung untere Membran Edelstahlseil Ø 2 mm
6 Leuchtstoffröhren 4x
7 Flachstahlscheibe Ø 200 mm mit Stahlprofil verschweißt [50/50 mm
8 Zugbahn, in Membranende eingenäht
9 Edelstahlrohr mit Abstandshaltern Ø 114 mm
10 Aluminiumrohr verrohrmt Ø 150 mm
11 Stahlrohr feuerverzinkt Ø 100 mm
12 Stahlrohr beweglich □ 60/60 mm
13 Getriebe mit Handkurbel
14 Klappadapter Flachstahl 2× Ø 190/190 mm
15 Natursteinplatte 120 mm, Sandbett 80 mm
16 Elektrohülse Stahlrohr feuerverzinkt Ø 75 mm
17 Brunnenring Ø 960 mm, ausbetoniert
18 Entwässerung PVC-Rohr
19 Stromanschluss

1 watertight junction with zip
2 polyester membrane with acrylic coating 260 g/m², flameproof; > 700 mm head of water
3 20/40 mm aluminium RHS
4 40/32/40 mm aluminium channel
5 Ø 2 mm stainless-steel cable as lower membrane fixing
6 4x fluorescent tubes
7 Ø 200 mm steel disc welded to 50/50 mm steel channel
8 tie strip sewn to end of membrane
9 Ø 114 mm stainless-steel tube with spacers
10 Ø 150 mm chromium-plated aluminium tube
11 Ø 100 mm galvanized steel tube
12 60/60 mm sliding steel SHS
13 cranking handle and transmission
14 2x 190/190 mm steel SHS hinged adaptor
15 120 mm stone paving slabs; 80 mm bed of sand
16 Ø 75 mm galvanized steel sleeve
17 Ø 960 mm precast concrete ring filled with concrete
18 PVC drainpipe
19 electrical connection

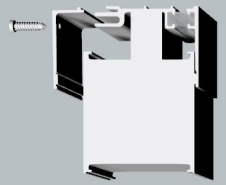
Isometrie
Maßstab 1:10
Isometric
scale 1:10

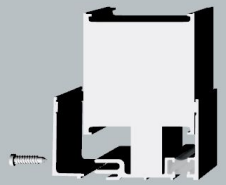


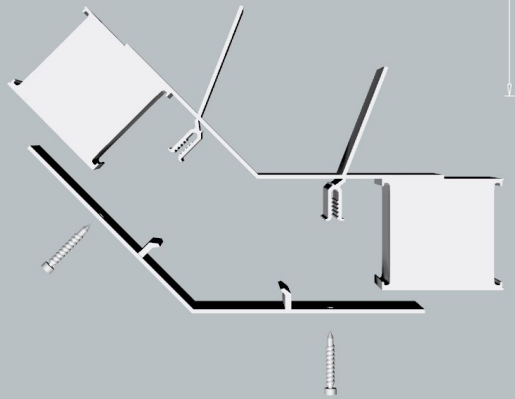


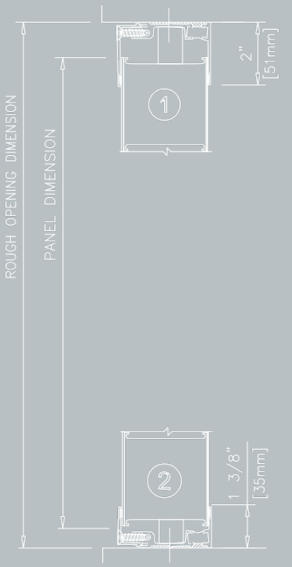
Umbrella roof structure

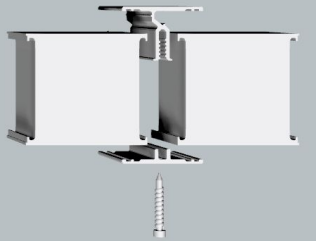
Corner details customized from existing Kalwall details

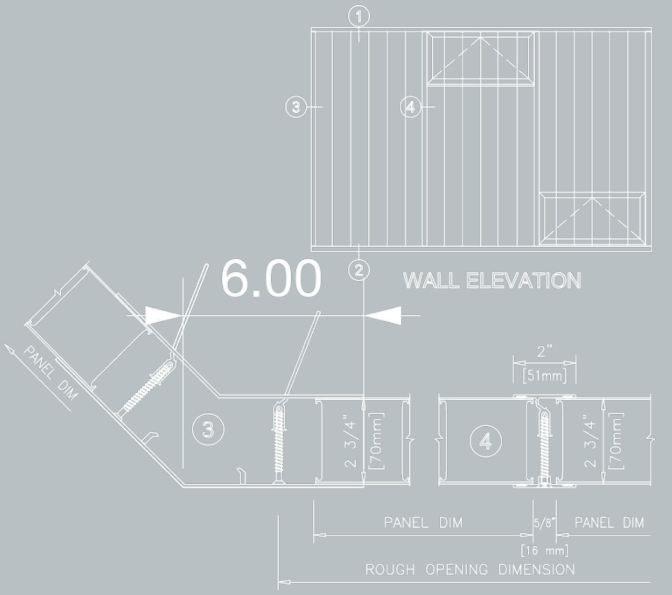












Roof structure

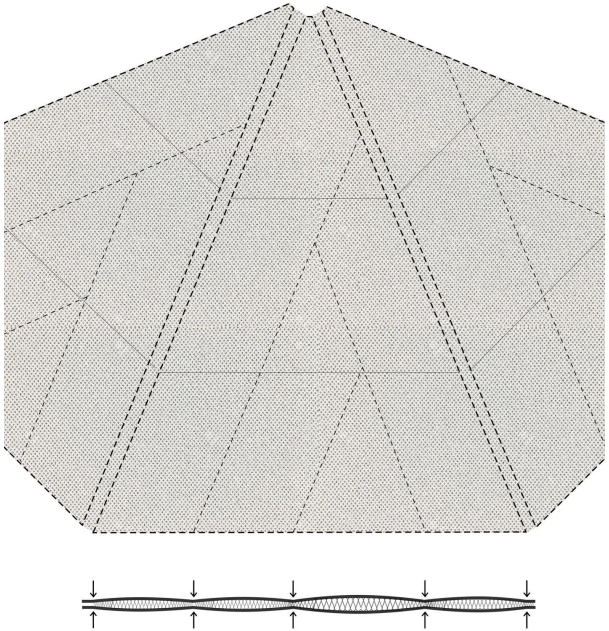
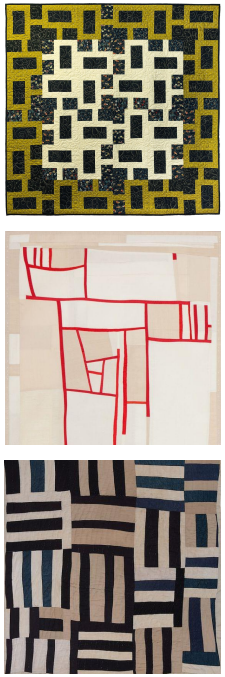


Diagram of the seams to add structure to the material



Inspiration for different patterns

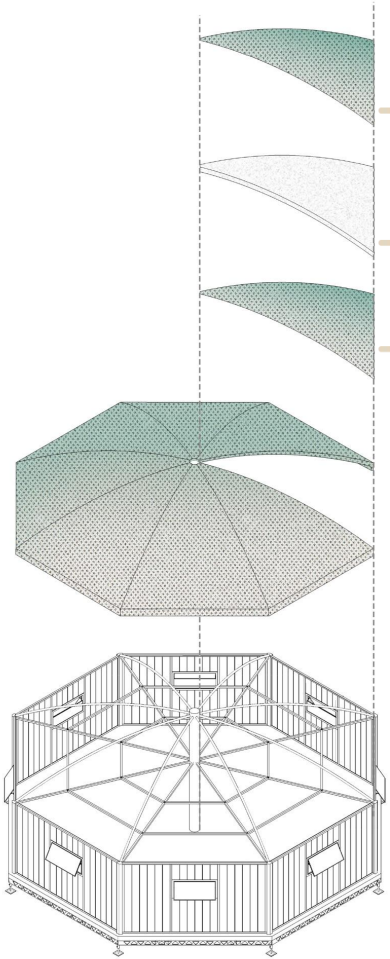
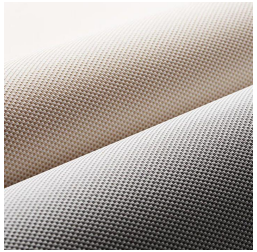


Diagram of the different layers of materials

POLYESTER FIBERS

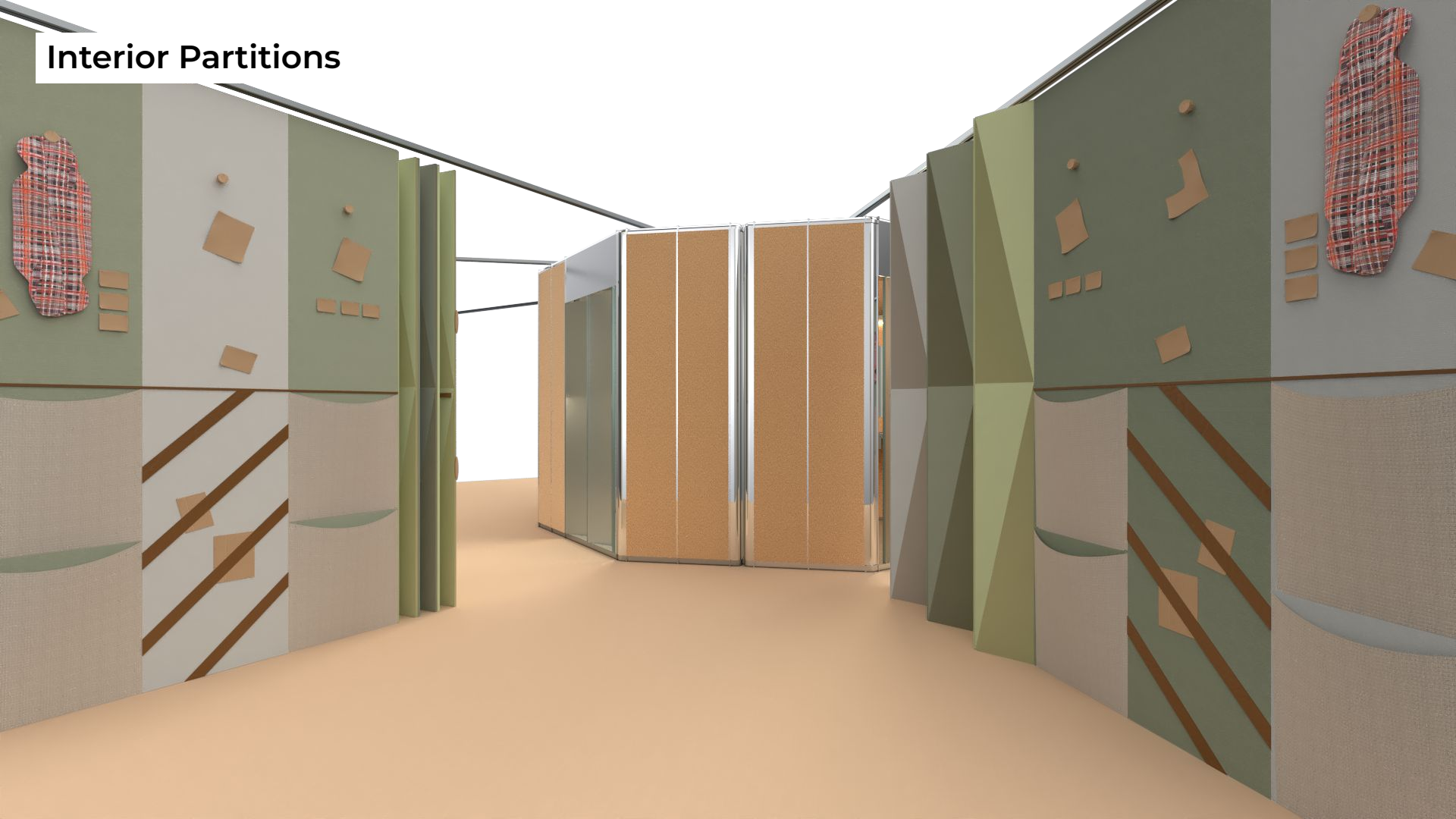
CABOT® AEROGEL INSULATION

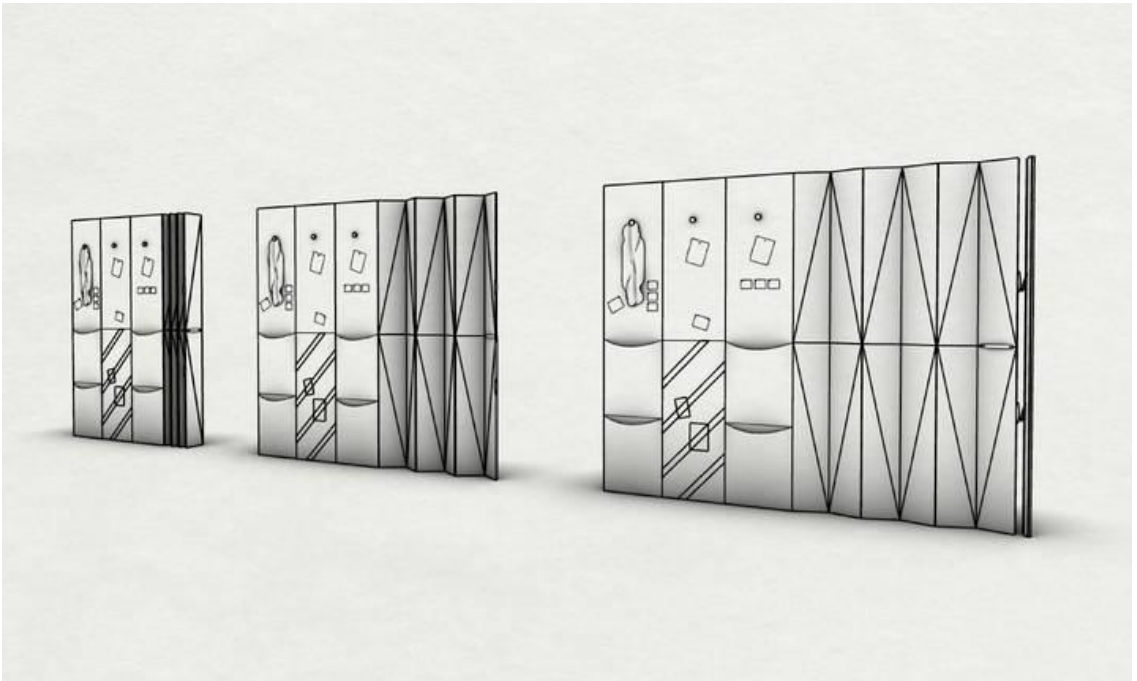


SOUND ABSORBING POLYESTER FIBERS

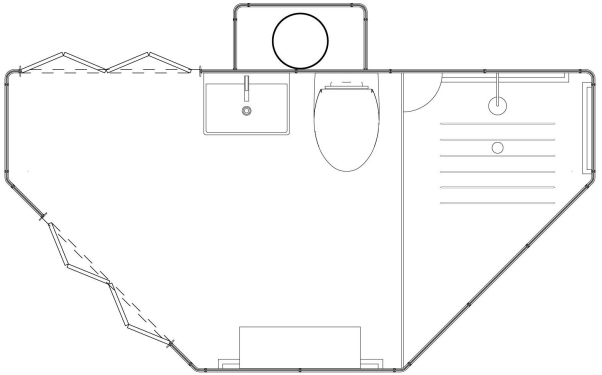
Interior spaces

Interior Partitions

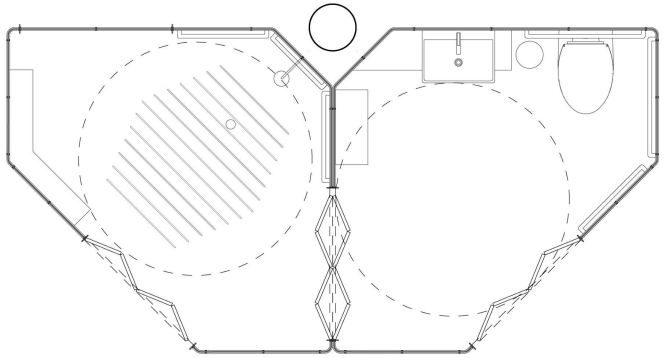




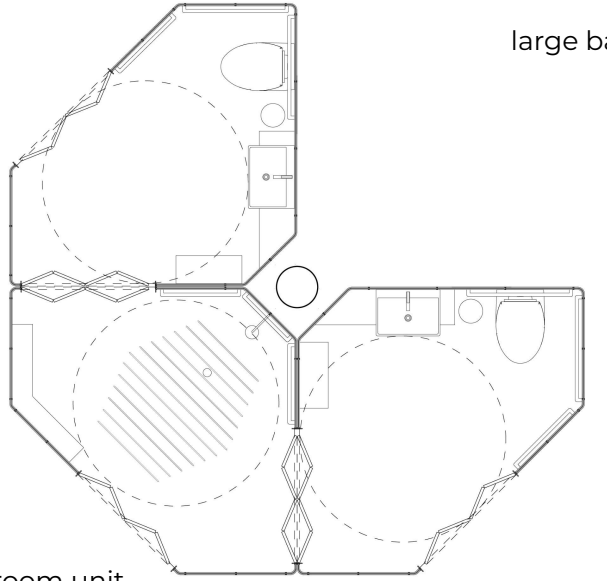
Bathroom Layouts



small bathroom unit

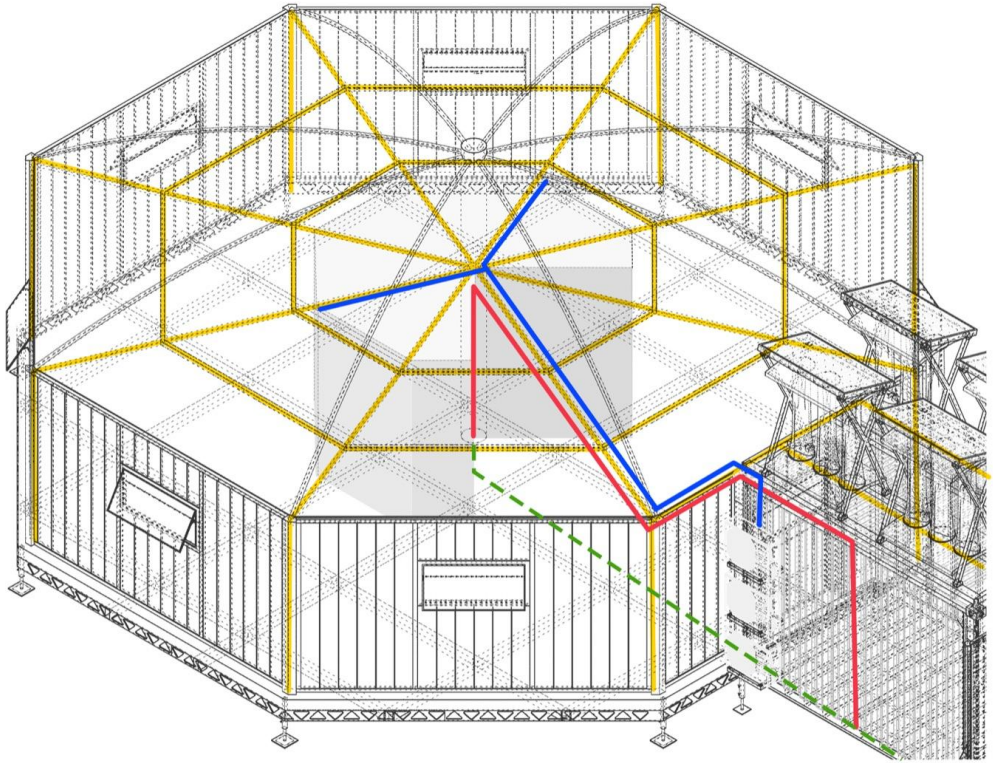


large bathroom unit



x-large bathroom unit

Services



Waste
HVAC
Water
Electricity

Diagram of the pipes inside the housing

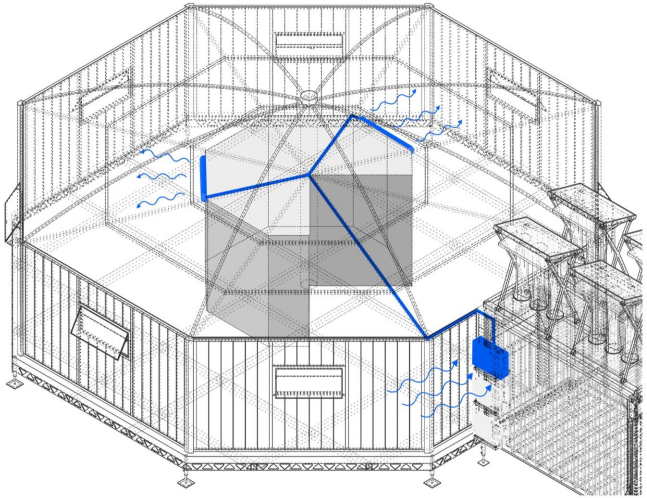


Diagram of the HVAC system

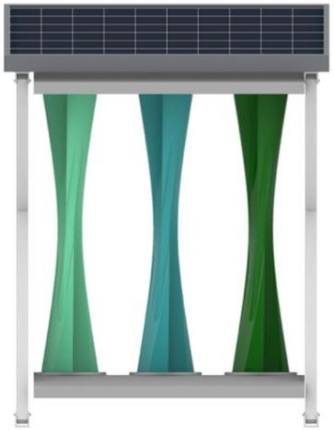
Entrance container

Windstream energy technologies
SolarMill SM2-6P

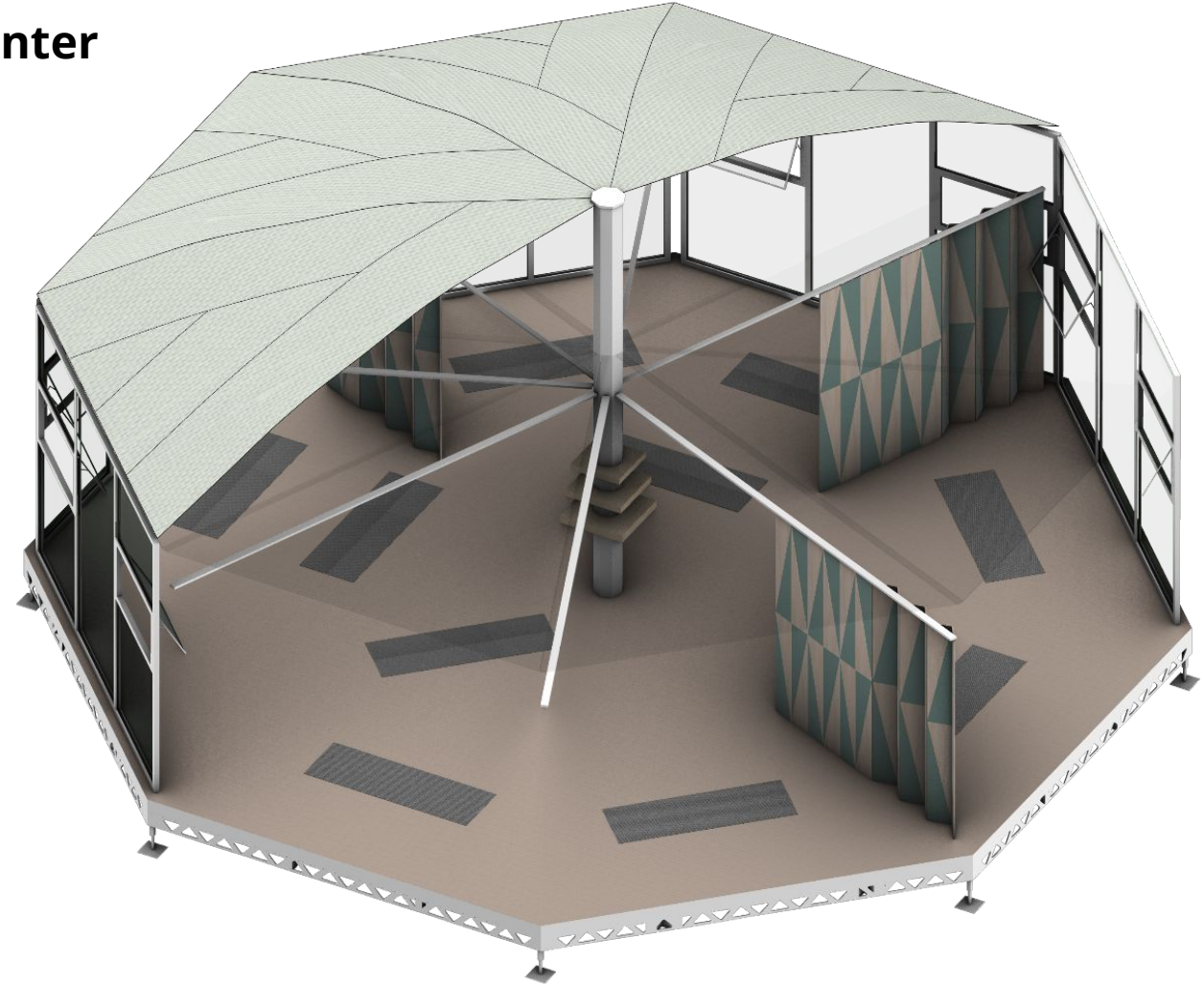
Entire System	
SolarMill Dimensions	1460 mm (L) x 840 mm (W) x 1900 mm (H)
Weight	225 lbs | 102.06 kgs
Cover Material	UV Resistant HDPE
Frame	Galvanized G-90 Steel and Aluminum
Electronics Enclosure Rating	IP53
Electrical Connection	On-Board Battery Charge Controller Grid-Tied Inverter (Optional)
Generator	Permanent Magnet Axial Gap
Design Life	25 Years

Wind Component	
Turbine Related Power Output	143 W @ 11 m/s
Wind Component Maximum Power Output	500 W @ 17 m/s
Maximum Voltage	57 DC
Maximum Current	30 Amps
Rotor Diameter	13 in | 0.33 m
Cut-In Wind Speed	4.5 mph | 2 m/s
Cut-Out Wind Speed	38.03 mph | 18.5 m/s
Swept Area	1,519 in2 | 0.980 m2
Turbine Material	Galvanized G-90 Steel

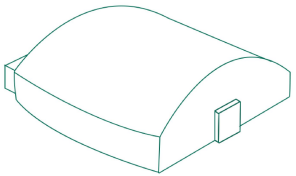
Solar Component	
Maximum Power (Pmpp)	490 W
Voltage at Max Power (Vmpp)	30.1 V
Current at Max Power (Impp)	8.2 A
Open Circuit Voltage (Voc)	37.7 V
Short Circuit Voltage (Voc)	8.7 A
* Reduction in module efficiency with decrease in irradiation level from 1000 W/ m2 to 200 W/m2 (at 25 degrees C)	
Maximum System Voltage	1000 V
Solar Cells	Monocrystalline
No. of Cells	120



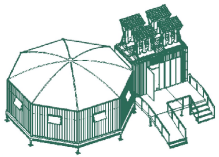
Wellness center



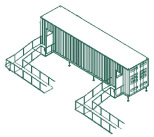
Community layout



Community hall

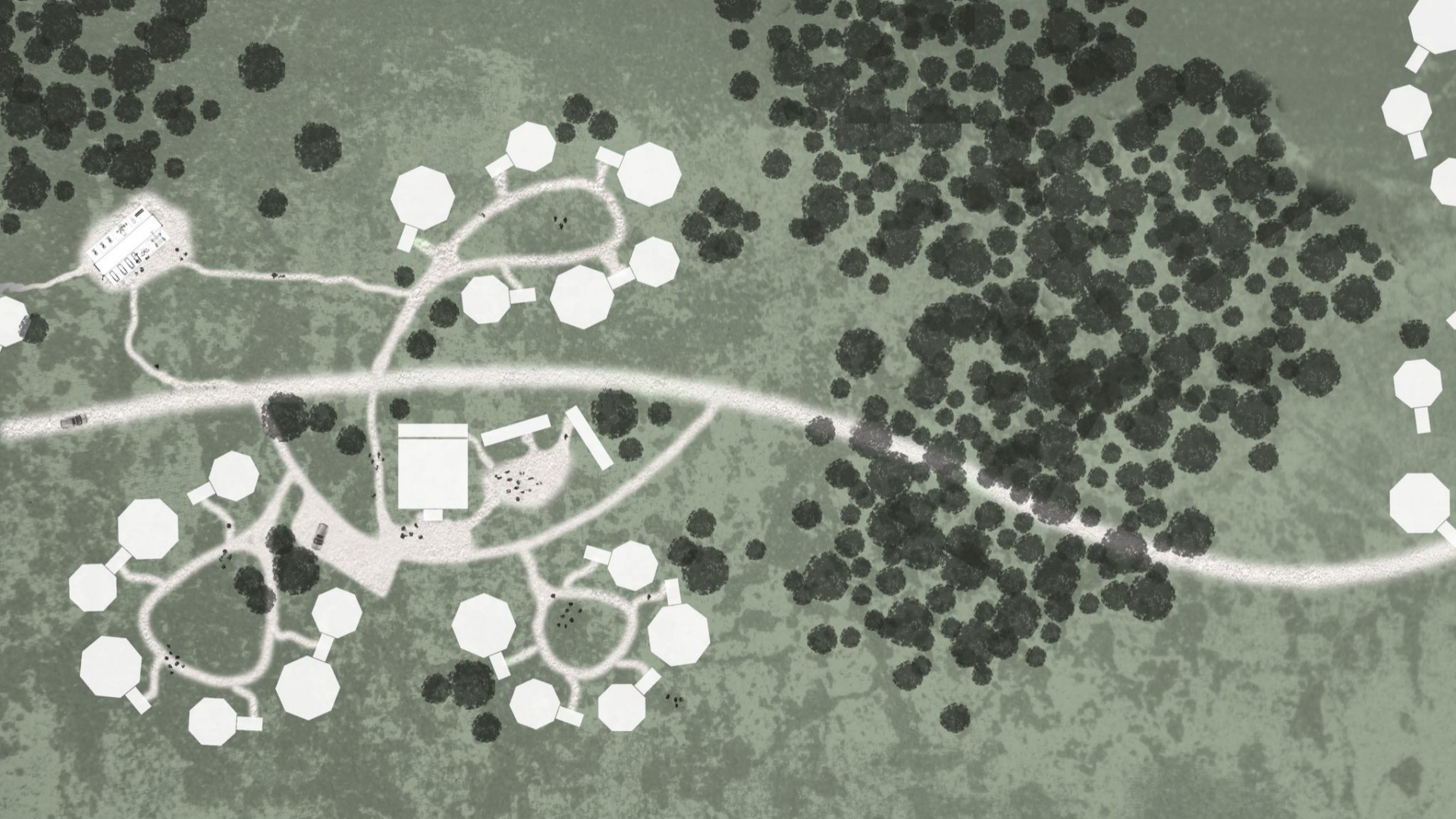


One house



Public toilet

Laundry




The community comes back to life