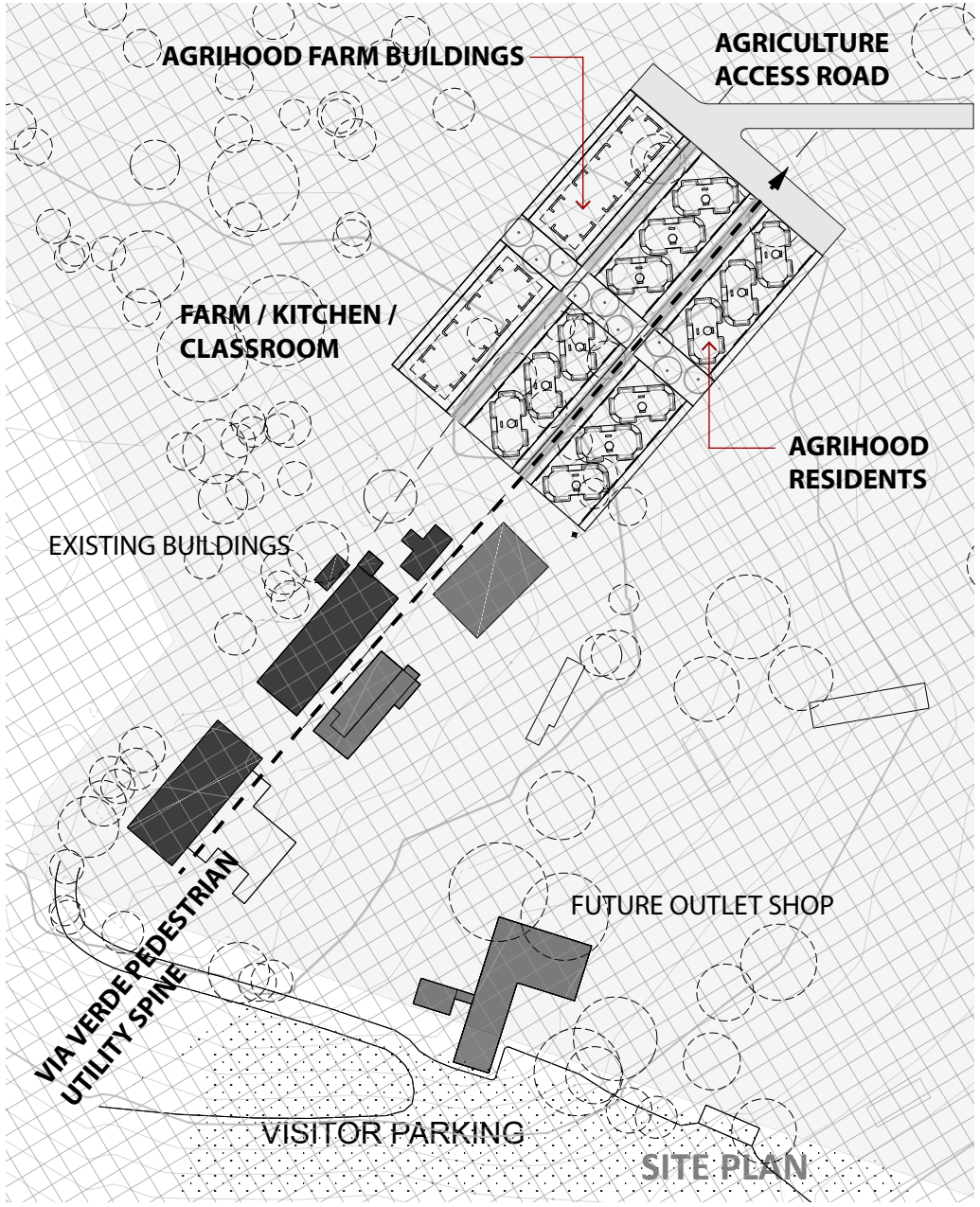
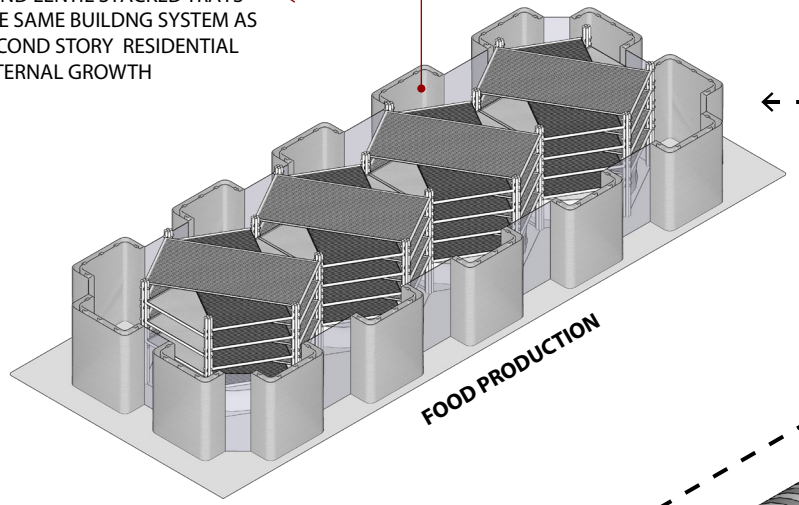
IMMEDIATE NEIGHBORS AGRIHOOD



POND LENTIL STACKED TRAYS
USE SAME BUILDNG SYSTEM AS SECOND STORY RESIDENTIAL INTERNAL GROWTH

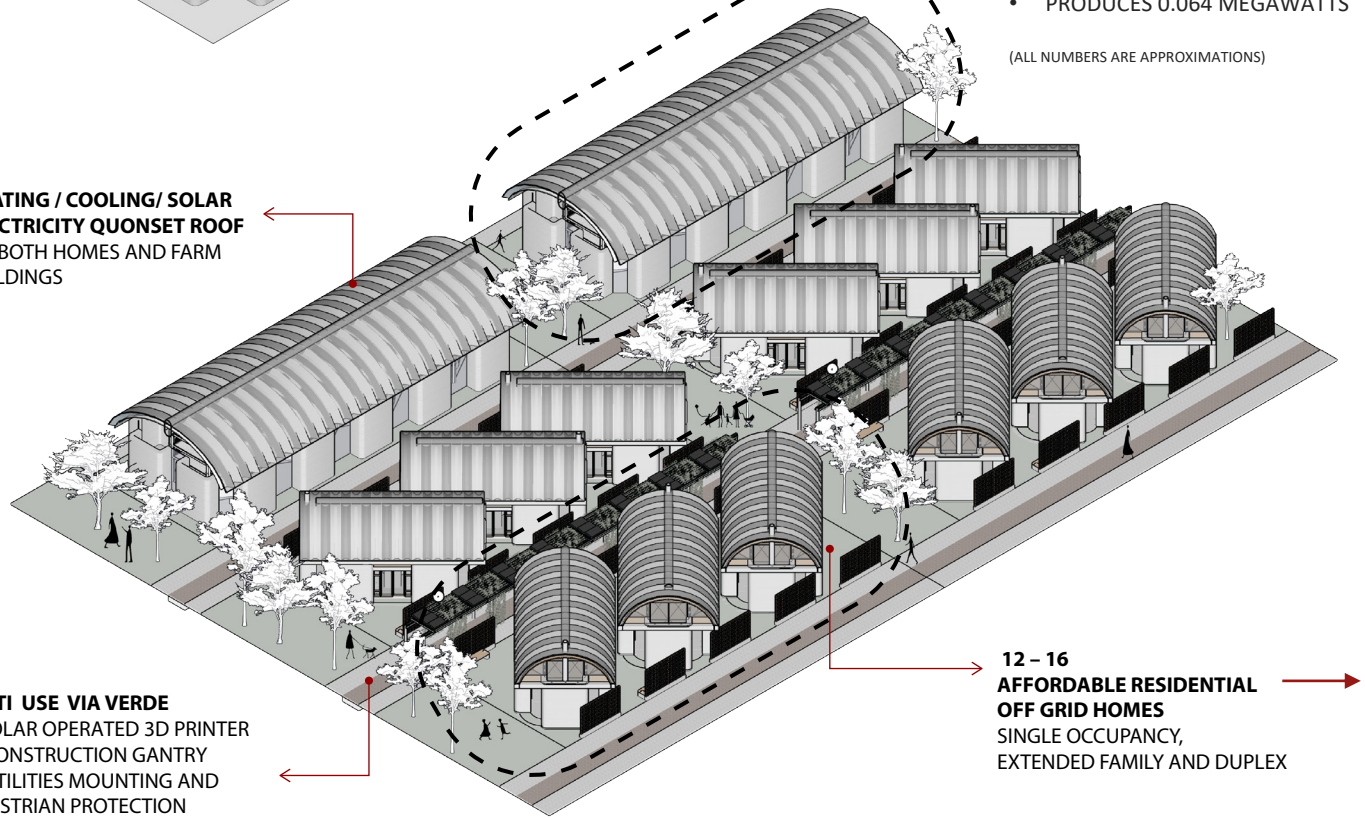


24/ 7 LED FULL SPECTRUM DUCKWEED FARM
1) MEAT REPLACEMENT
2) DAIRY REPLACEMENT
3) GRAIN REPLACEMENT
(FOR APP. 40 PEOPLE)

TOTAL POND LENTIL AREA OF ONE "AGRI" BLOCK - 8,800 sq ft
- PROVIDES ENOUGH OXYGEN FOR 80 PEOPLE
- SEQUESTERS 2,668 POUNDS OF CARBON
- PRODUCES25,580 GRAMS OF PROTEIN, ENOUGH PROTEIN FOR 464 MEN OR 568 WOMEN
- PRODUCES 0.064 MEGAWATTS

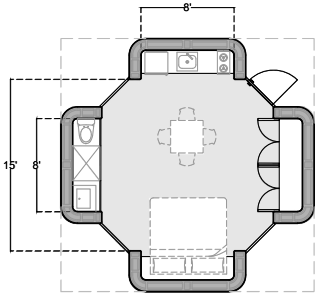
(ALL NUMBERS ARE APPROXIMATIONS)

HEATING / COOLING/ SOLAR ELECTRICITY QUONSET ROOF
ON BOTH HOMES AND FARM BUILDINGS



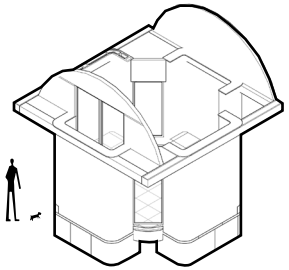
MULTI USE VIA VERDE
1) SOLAR OPERATED 3D PRINTER
2) CONSTRUCTION GANTRY
3) UTILITIES MOUNTING AND PEDESTRIAN PROTECTION
4) SECURE ENTRANCE

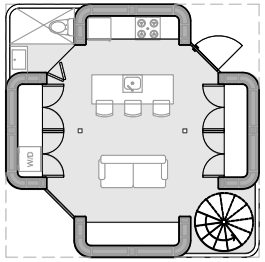
12 – 16 AFFORDABLE RESIDENTIAL OFF GRID HOMES
SINGLE OCCUPANCY,
EXTENDED FAMILY AND DUPLEX

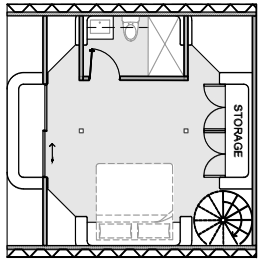


GROWTH

SMALL UNIT – 1 LEVEL – 1 BED
345 SQ FT

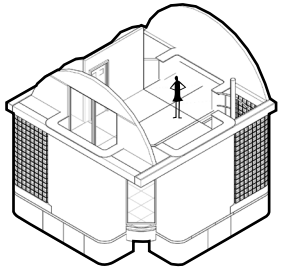


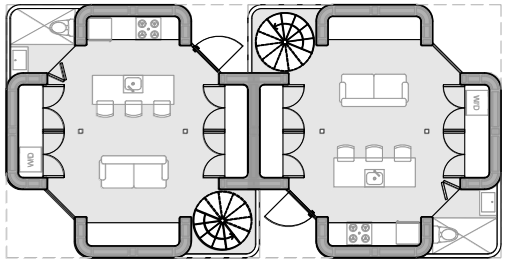


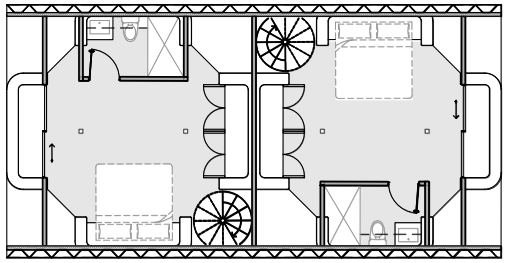


SMALL UNIT – 2 LEVELS – 1 BED
F1 - 408 SQ FT

F2 - 325 SQ FT

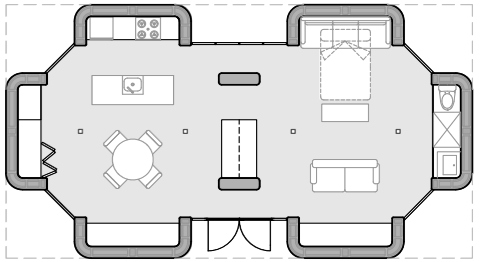






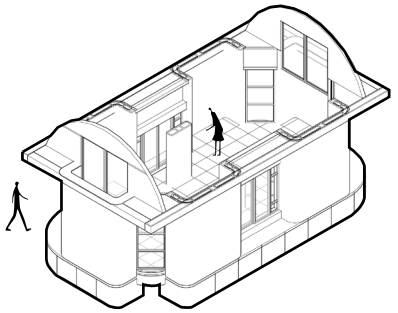
SMALL UNIT – DUPLEX
F1 - 408 SQ FT PER UNIT

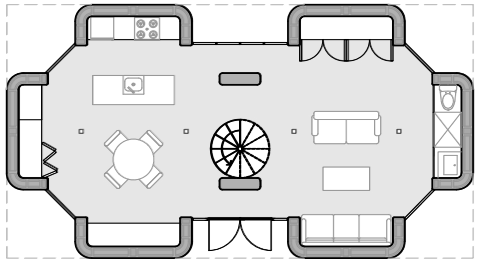
F2 - 325 SQ FT PER UNIT

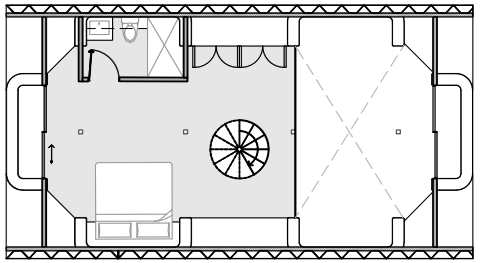


GROWTH

LARGE UNIT – 1 LEVEL – 1 BED
686 SQ FT

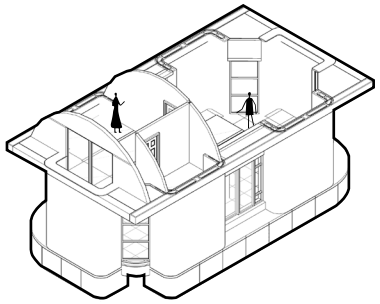


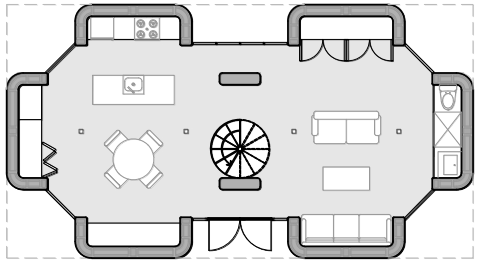


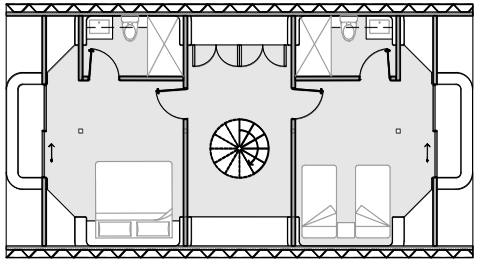


LARGE UNIT – 2 LEVELS – 1 BED
F1 - 686 SQ FT

F2 - 403 SQ FT

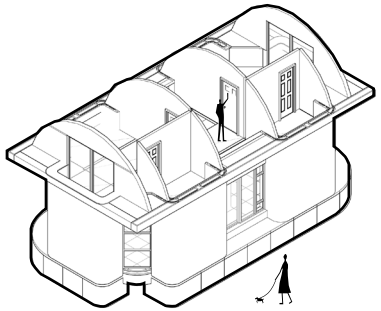


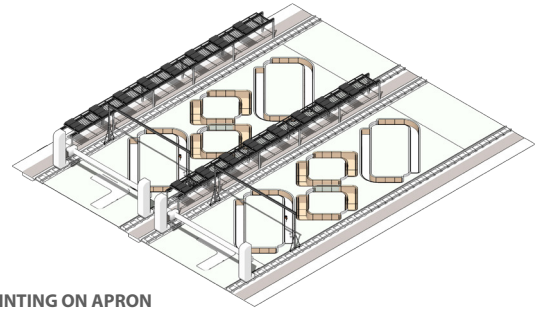




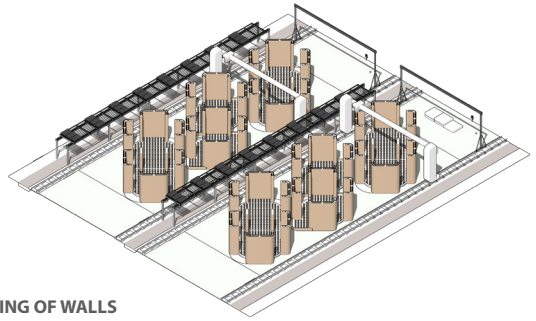
LARGE UNIT – 2 LEVELS – 2-3 BED
F1 - 686 SQ FT

F2 - 643 SQ FT

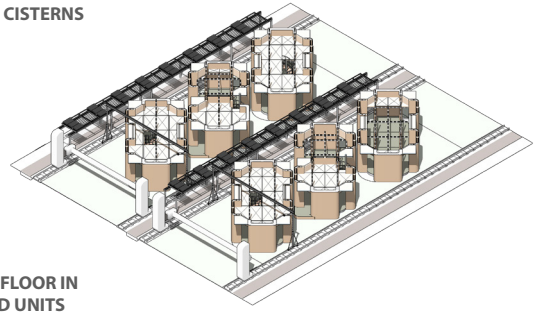




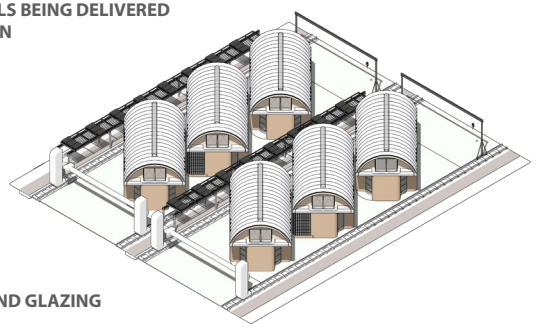
3D PRINTING ON APRON
CONSTRUCTION GANTRY MOVES
PRINTED CISTERNS



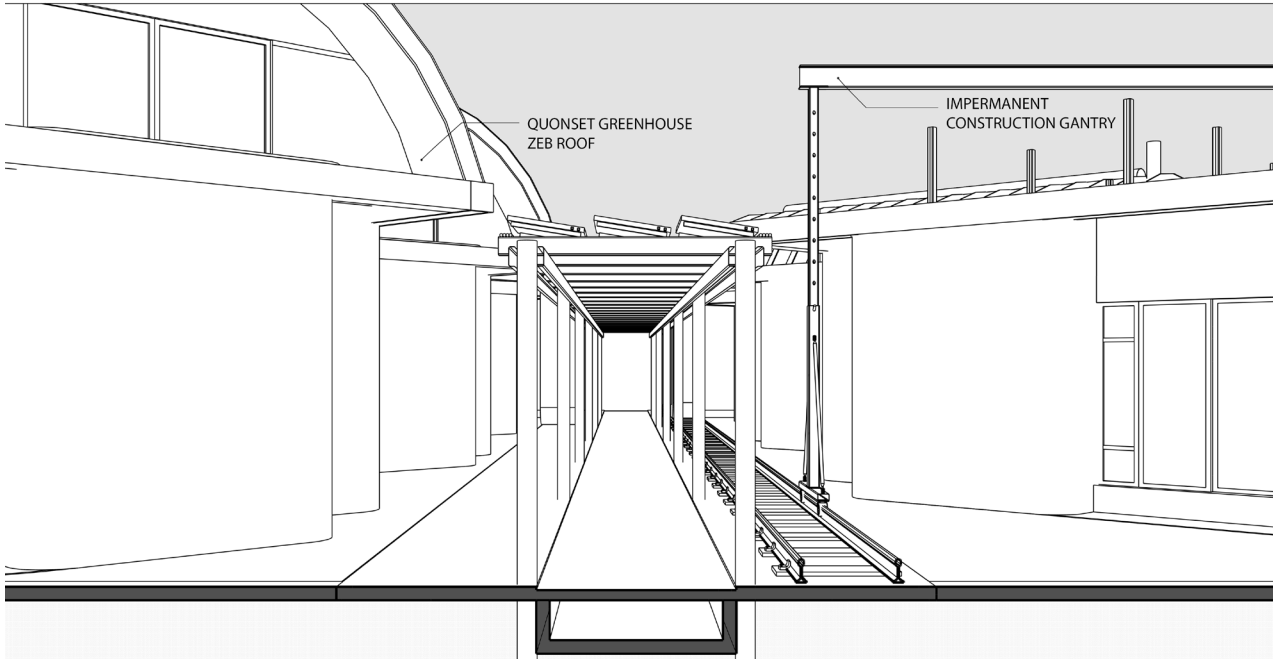
3D PRINTING OF WALLS
MATERIALS BEING DELIVERED
ON APRON



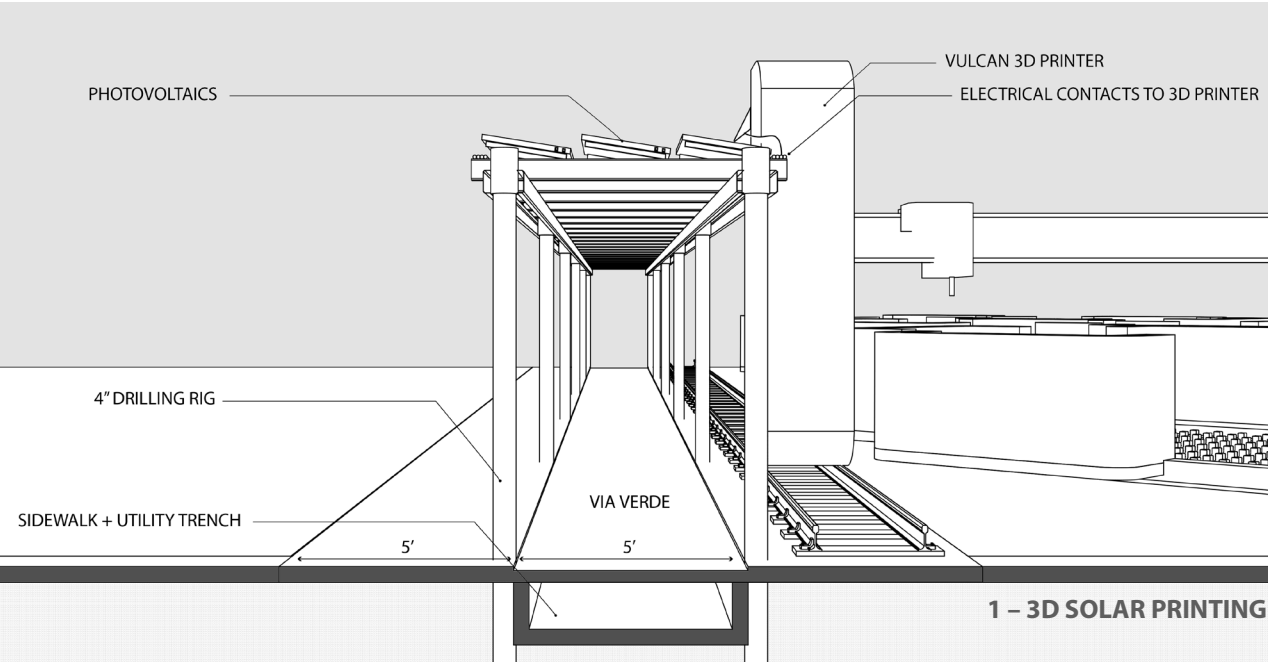
SECOND FLOOR IN
SELECTED UNITS



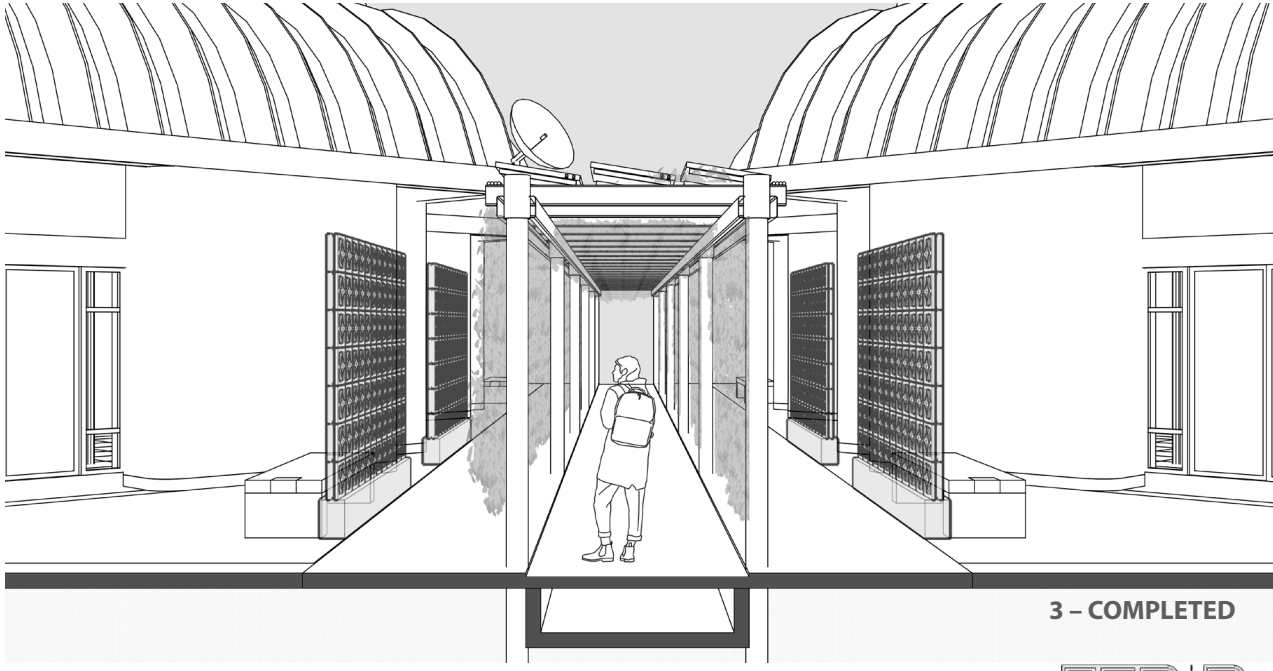
ROOFS AND GLAZING



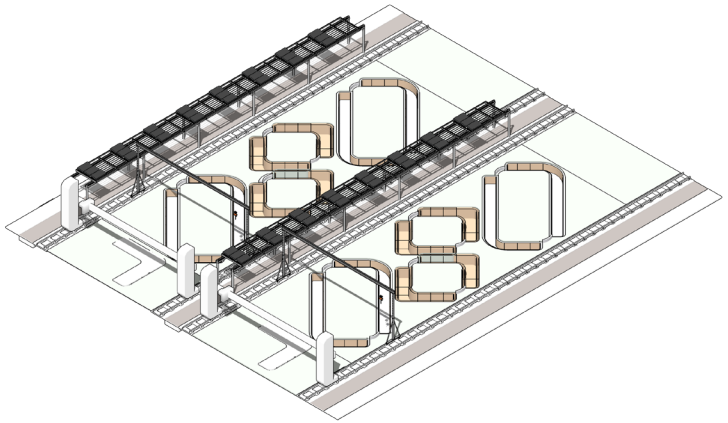
2 – GANTRY FOR SECOND LEVEL AND ROOFS



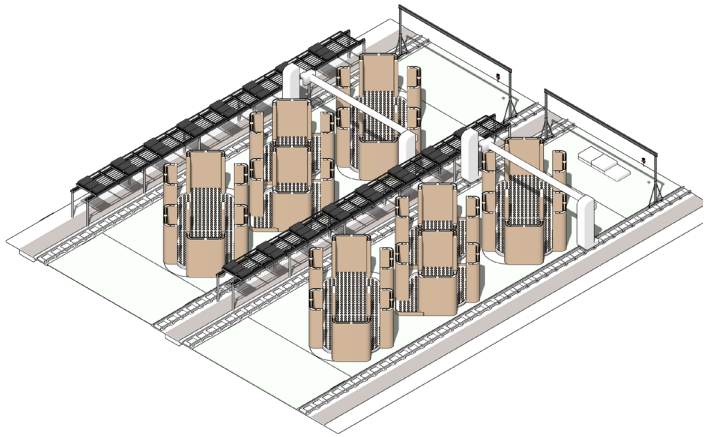
1 – 3D SOLAR PRINTING



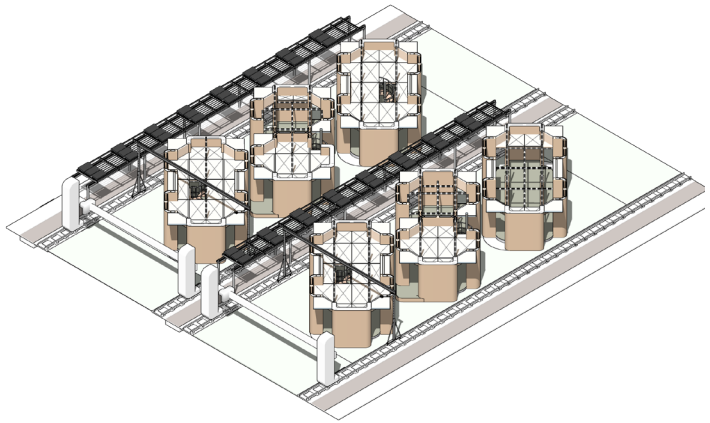
3 – COMPLETED



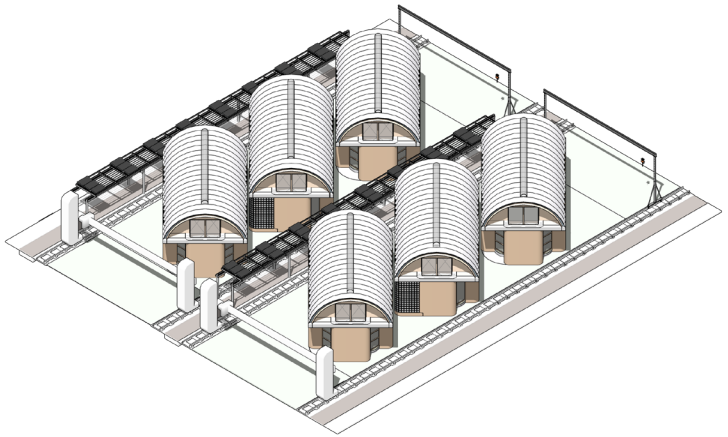
3D PRINTING ON APRON
CONSTRUCTION GANTRY MOVES PRINTED CISTERNS



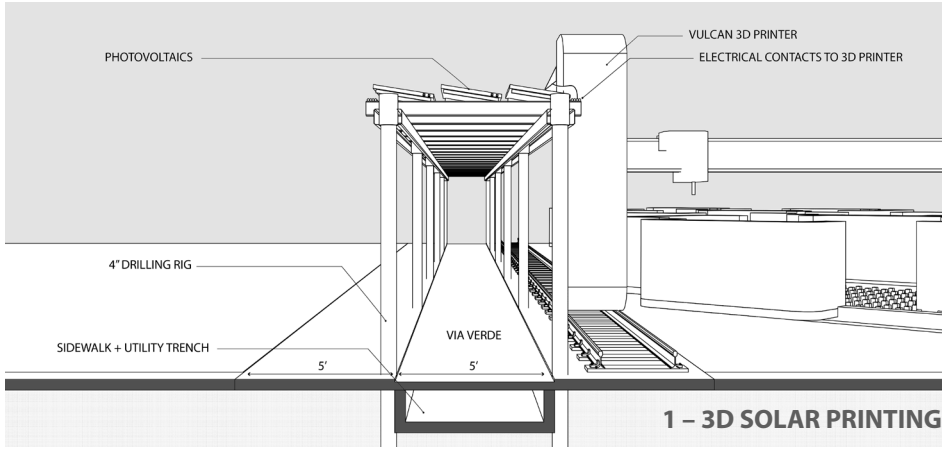
3D PRINTING OF WALLS
MATERIALS BEING DELIVERED ON APRON



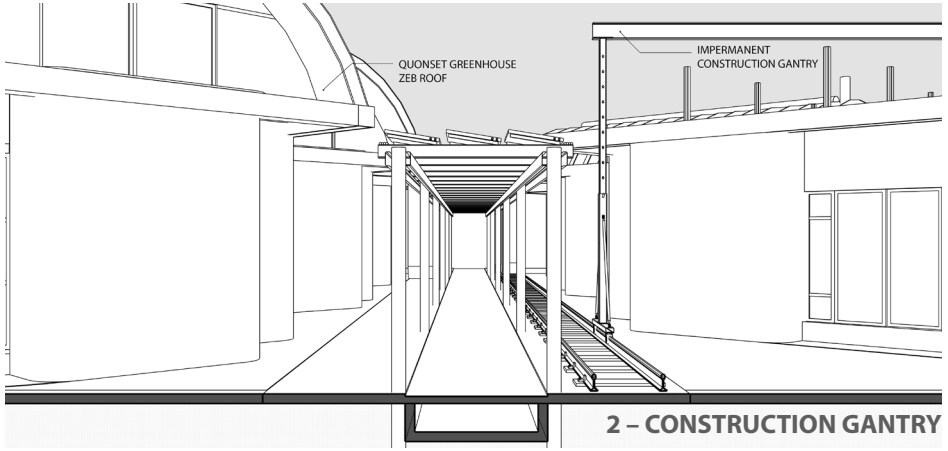
SECOND FLOOR IN SELECTED UNITS



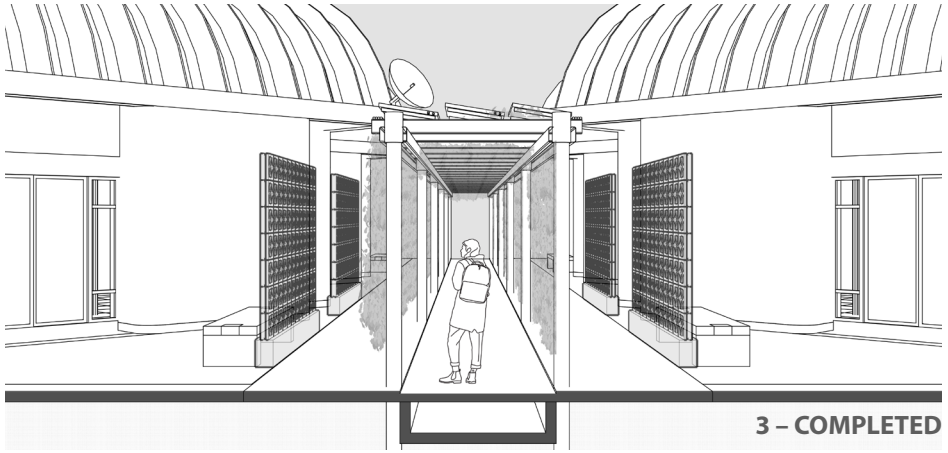
ROOFS AND GLAZING



1 – 3D SOLAR PRINTING



2 – CONSTRUCTION GANTRY

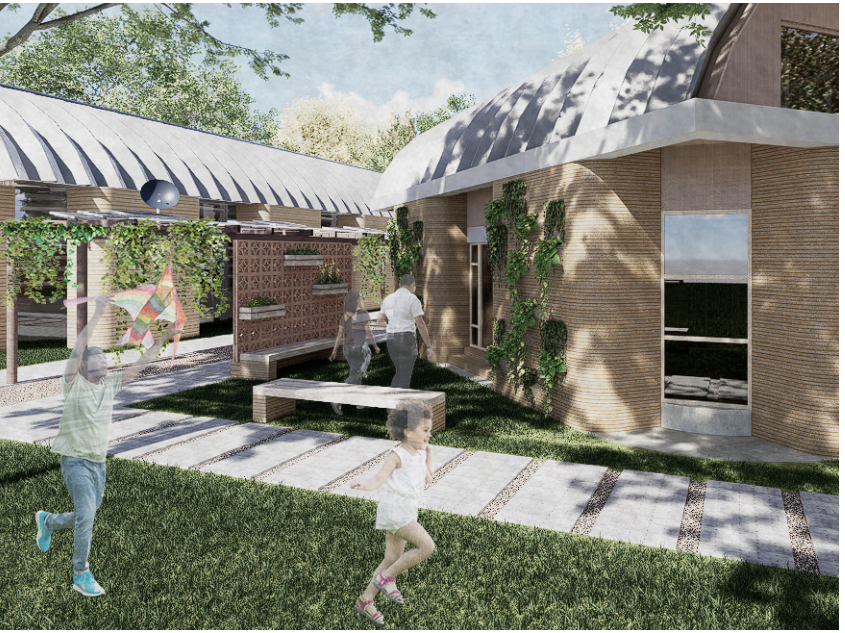


3 – COMPLETED

VIA VERDE

BASIC UNIT – GROUND FLOOR

VIA VERDE AND EV PARKING

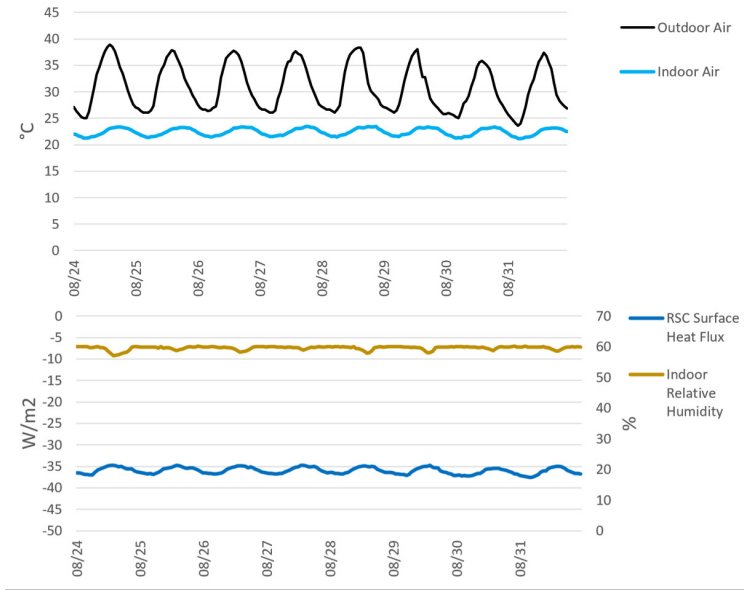


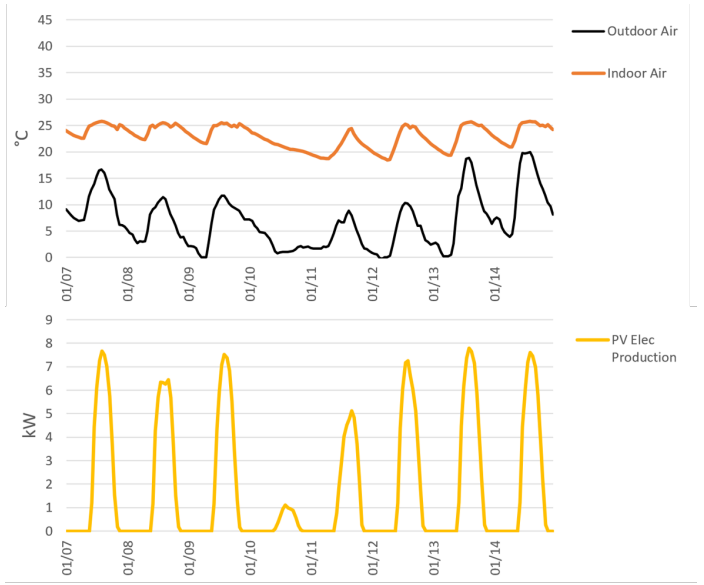
SHARED OUTDOORS

BASIC UNIT – SECOND FLOOR

AGRI AND PLAYGROUND

RADIANT SKY COOLING MEMBRANE + THIN-FILM PV + INGENUITY = AIR CONDITIONING AND HEATING WITH NO COMPRESSOR OR FURNACE



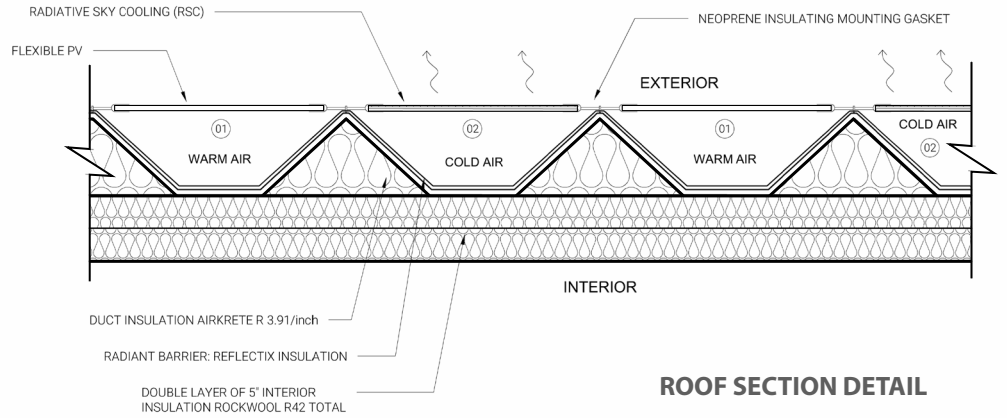


COOLING MODE

Radiant sky cooling (RSC) is a commercially-available technology that radiates heat directly to outer space through the "atmospheric window" of wavelengths to which earth's atmosphere is largely transparent. Our positive net-energy system employs an RSC membrane over alternating channels in the quonset hut shell to form heat exchange ducts. During the cooling season, fans circulate air through these ducts and the 3d printed wall cavities to store "coolth" in the cistern and concrete hypocaust floor. Living spaces are conditioned as-needed using this pre-cooled mass.

HEATING MODE

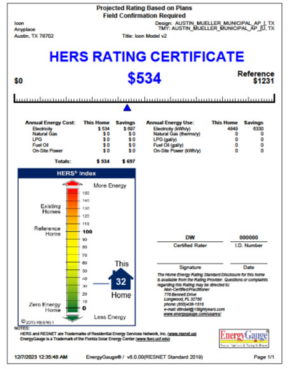
Thin-film photovoltaic membrane covers alternating channels of the quonset hut to form heat exchange ducts to capture heat from the back of the PVs. In combination with solar gain, internal loads and reduced heat loss from a very tight envelope, this heat satisfies heating loads. Fans circulate air to store heat and condition the living spaces using the same scheme described above.



ROOF SECTION DETAIL

ENERGY STAR

The ENERGY STAR/HERS rating is not designed to consider housing with no conventional heating/cooling equipment. We used EnergyGauge to create the rating shown, entering the maximum performance values for a heat pump system. The actual rating would be better if our proposed scheme could be properly modeled in that system.

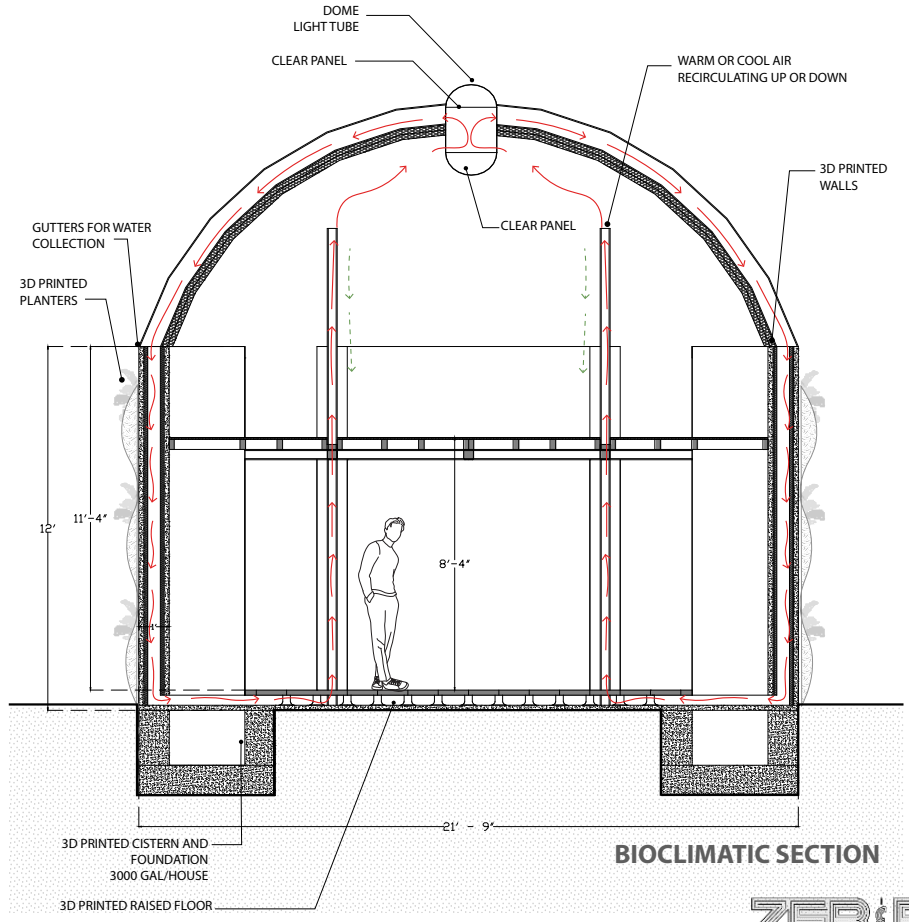


ENERGY SIMULATION

The proposed system was simulated using EnergyPlus. For the average heat flux from the RSC film, we conservatively selected ~35 W/m2 after reviewing multiple peer-reviewed academic papers and one meta study presenting values ranging from 20-100 W/m2, depending on the specific situation.

SMALL UNIT- 2 LEVEL

Site Energy Consumption	2,150 kWh
PV Energy Production (house only)	2,250 kWh
Net Energy Consumption	**-100 kWh**
Photovoltaic Array Size	1.45 kW



BIOCLIMATIC SECTION

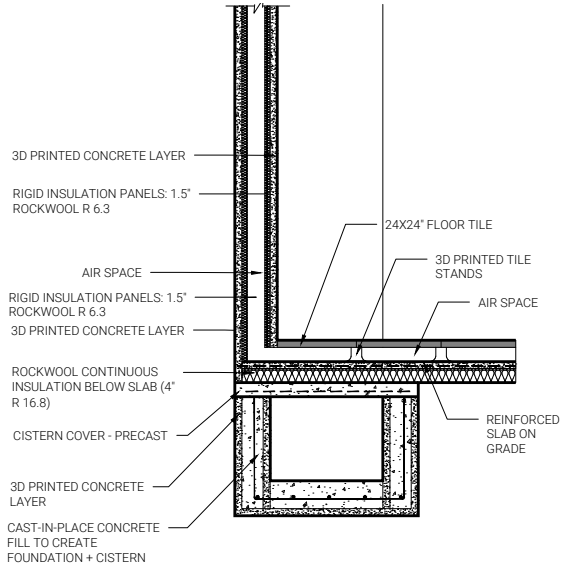
ZEB+B – COMMUNITY INNOVATIONS

3D PRINT TECHNOLOGY

- ENTIRE COMMUNITY AGRICULTURE AND HOUSING 3D PRINTED
- ENTIRE COMMUNITY USES SOLAR POWERED 3D PRINTER GANTRY OPERATED FROM VIA VERDE MICRO GRID
- 3D PRINTED WALLS AND FLOOR USED AS ACTIVE HEAT/COOL MASS FACILITATED BY ZEB ROOF SYSTEM
- PRINTER SLAB USED FOR VIA VERDE UTILITY SIDEWALK ON SIDES
- PRINTER EXTENSION/ENDS USED FOR PARKING AND PLAYGROUND
- SOLAR POWERED MICRO GRID HAS OPTION OF REMAINING AS BACK TO GRID
- INTERNAL SECOND STORY GROWTH

PRELIMINARY BUDGET

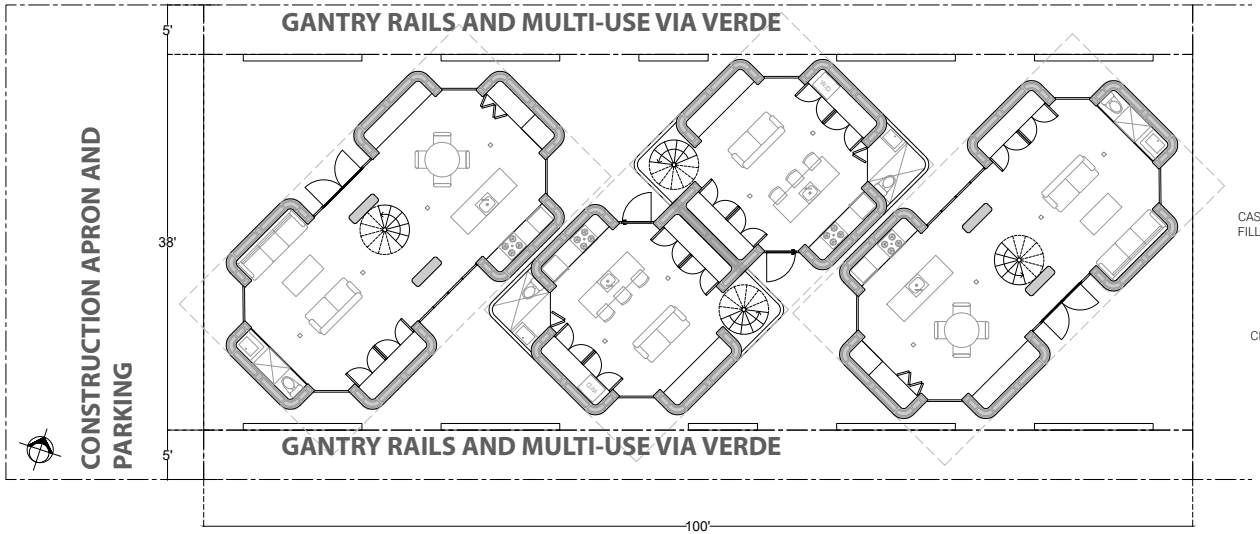
		AFFORDABLE 1 LEVEL - 350sf	AFFORD 2 LEVEL- 600 sf	DUPLEX Ext fam
SITE PREP				
	Base Material Excavation/Topsoil Storage	3,000	3,000	2000
	Construction Slab Apron	1,000	1,000	900
	sub total	4,000	4,000	2900
MULTI INFRASTRUCTURE CORRIDOR/ unit share				
	Power Third Rail	2800	2800	2800
	Battery Storage	2200	2200	2200
	3D Gantry Setup	3000	3000	3000
	Construction Gantry Setup	2000	2000	2000
	sub total	10,000	10,000	10,000
3D PRINTER MANUFACTURING				
	Foundation Modules & Covers	9,500	9,500	16,500
	U-shaped Walls	10,500	10,500	21,500
	Subtotal	19,500	19,500	38,000
OFFSITE APRON DELIVERED COMPONENTS				
	Quonset Roof Component	3,000	3,000	5,000
	Insulation	1,500	1,500	2,500
	Glazing/Doors	17,000	17,000	16,000
	Flexible PV's / waste heat and Rad-Sky Cooling	12,750	12,750	20,750
	Kitchen/Bath/Bed Inserts	10,000	10,000	11,000
	Second Floor Kit (Post & Beam& floor)		14000	25000
	Spiral Stair Kit		1000	1000
	subtotal	44,250	59,250	80,250
LANDSCAPE PLANTS & FURNITURE		950	950	1200
	TOTAL	$78,200 $224 / sf	$93,200 $155 / sf at 600sf	143,130 $120 / sf

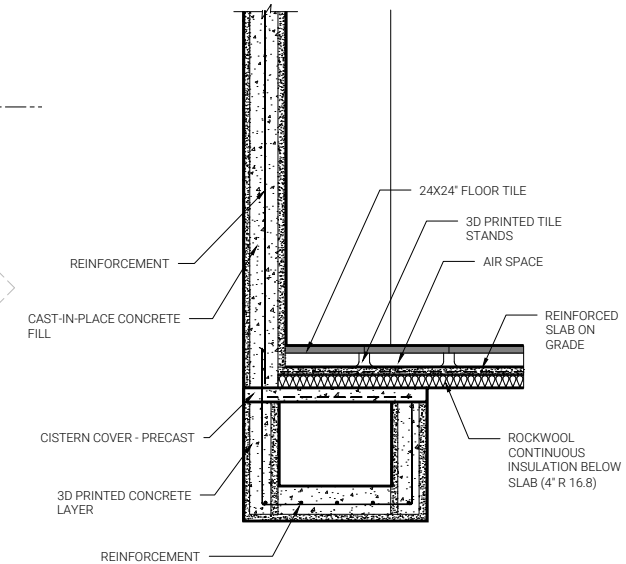


AUXILIARY INNOVATIONS

- EXTENSIVE USE OF PRE-MANUFACTURED KITS TO LOWER COST
- QUONSET ROOF SYSTEM PROVEN TO WITHSTAND TORNADOS
- QUONSET ROOF SYSTEM ENGINEERED SOLAR READY WITH FLEXIBLE PV AND RADIANT SKY COOLING SYSTEM
- SECOND STORY GROWTH USES EASLIY CONSTRUCTED KIT
- CODE APPROVED POST AND BEAM AND FLOOR KITS, ALSO USED FOR INTENSIVE AGRICULTURE TO SUPPORT LARGE GROWING TRAYS
- CODE APPROVED SPIRAL STAIR KIT
- KITCHENS AND BATHROOM KITS THAT ENTER INTO 3D PRINTED FATWALLS

MULTIPLE POSSIBLE CONFIGURATIONS ON ONE PRINT BED





INNOVATIONS AND AFFORDABILITY