

This project proposes a way away of living that integrates itself with the earth, the landscape, environmental cycles, and crop cycles. The US Land Grid which organizes the landscape of the entire nation was a means of gaining control over the vast expanses of our agrarian landscape. In this case the grid is not implemented as a means of gaining control over the site, but as a means of generating variation in the crop planting and the modular system that generates the homes. This bifurcating grid allows a simple organizing system to be deployed at multiple linked scales, from the planting grid of the orange grove to the patterns on the screens of a home. Scale linking is deployed on the site both as a physical organization system and as an environmental concept of sustainability. The homes are built into the north facing slopes, allowing for a maximum use of the sunlit areas by the planting. They have private south facing courtyards that allow the homes to extend into the environment. The retaining walls are designed to let the landscape flow into the homes allowing plants to be integrated into the wall system. The modular retention tiles make ventilated screen walls when placed on a vertical position, allowing the ground plane to blend into the walls as the homes blend into the landscape which is formed by the organizing

grid. The terraces above and below the homes will be planted with orange groves. The lower slopes will hold smaller and more temporary crops.

**ORGANIZATION SYSTEM**

The organization of the dwelling units is based on the concept of Heliomorphic Form Location. This concept recognizes that the orientation and slope gravity of a land form can radically affect the amount of solar energy which falls on a specific site. This project begins by sub-dividing both site parcels based on a grid aligned with the cardinal points of a compass. This grid has been further sub-divided as the slope of the land increases. The color coded gridded site plan delineates the areas which receive the maximum solar radiation (yellow), and the areas which receive the least solar radiation (purple). The homes are organized on a module generated by this planting grid system.

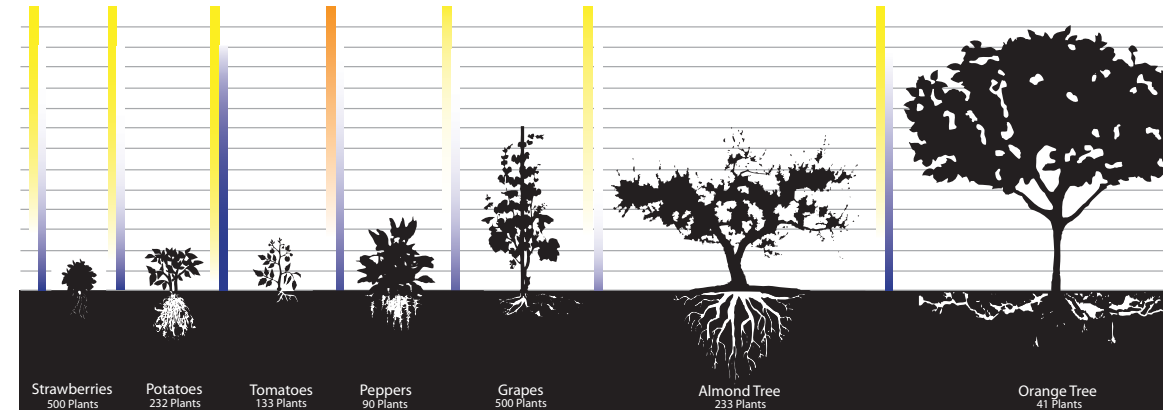
**WATER MANAGEMENT INFRASTRUCTURE**

California has an ideal environment for farming, however it has to import the majority of its water supply. Linking the site to the larger

community and the global water crisis, we propose a grey water and black water recovery system as an integral part of the landscape. A variation of the retention tiles would house the artificial wetlands and the grey water cleansing biomes, and the long-term storage cistern. The planting grids will be watered by the wastewater produced by the homes. The amount of land that will be farmed is directly proportional to the water requirements of the plants and the amount of wastewater that is generated by each home.

**OPEN AIR COMMUNITY BUILDING AND Co-op MARKET**

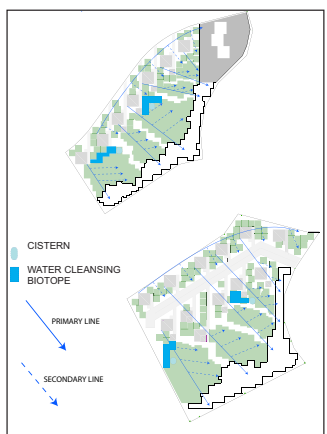
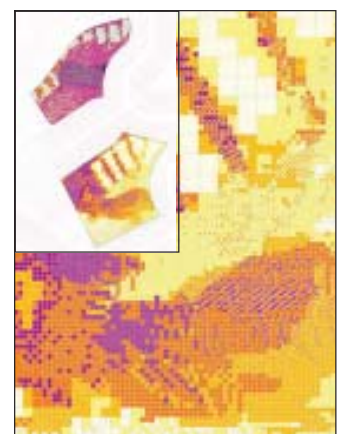
At the northern most corner of the site, adjacent to Bahia Drive, sits a community building. One third of the building is devoted to an open air meeting room for access by the homeowners. The other two thirds, are devoted to a cooperative market which highlights seasonal produce from the farmland. The co-op can then provide both income and convenience to the community. Locals could sell the produce that they have grown, and potentially home made pies, jellies, or other products using the on site produce. But, it also has a small "convenience store" which caters to the general public, but can also provide residents with requested items which they consume regularly.



Example:  
-Requires 75 Gallons of water per day  
-Full sun light required  
100 Gallons of water(output of house) / 75 Gallons of water(requirement of plant)=133 plants  
133 Tomatoes plants (on a 6' 3" module equals 9/25 planting squares

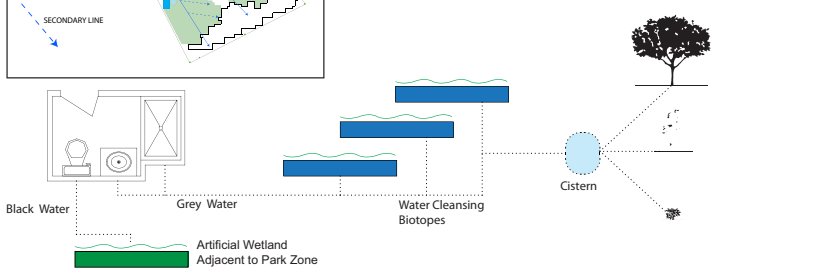
6'3 MODULE  
25' PLANTING SQUARE

**Planting schedule**  
Specific plants were chosen based on light and water availability in the California climate. Each plant was analyzed in relationship to the sites water. And light intake per day. Each plant was then broken down into a particular. Grid which is specific to the spacing required to grow the plant. That grid is then applied to the overall 25' planting grid arranged on the site. The specific number of plants organized on site is determined by how much each plant requires of water per day, divided by the output of water produced by the house. On average, each house produces 100 gallons of water per day. That output of grey water is used to irrigate the surrounding farmland.



**CONCEPTUAL COST ESTIMATE**

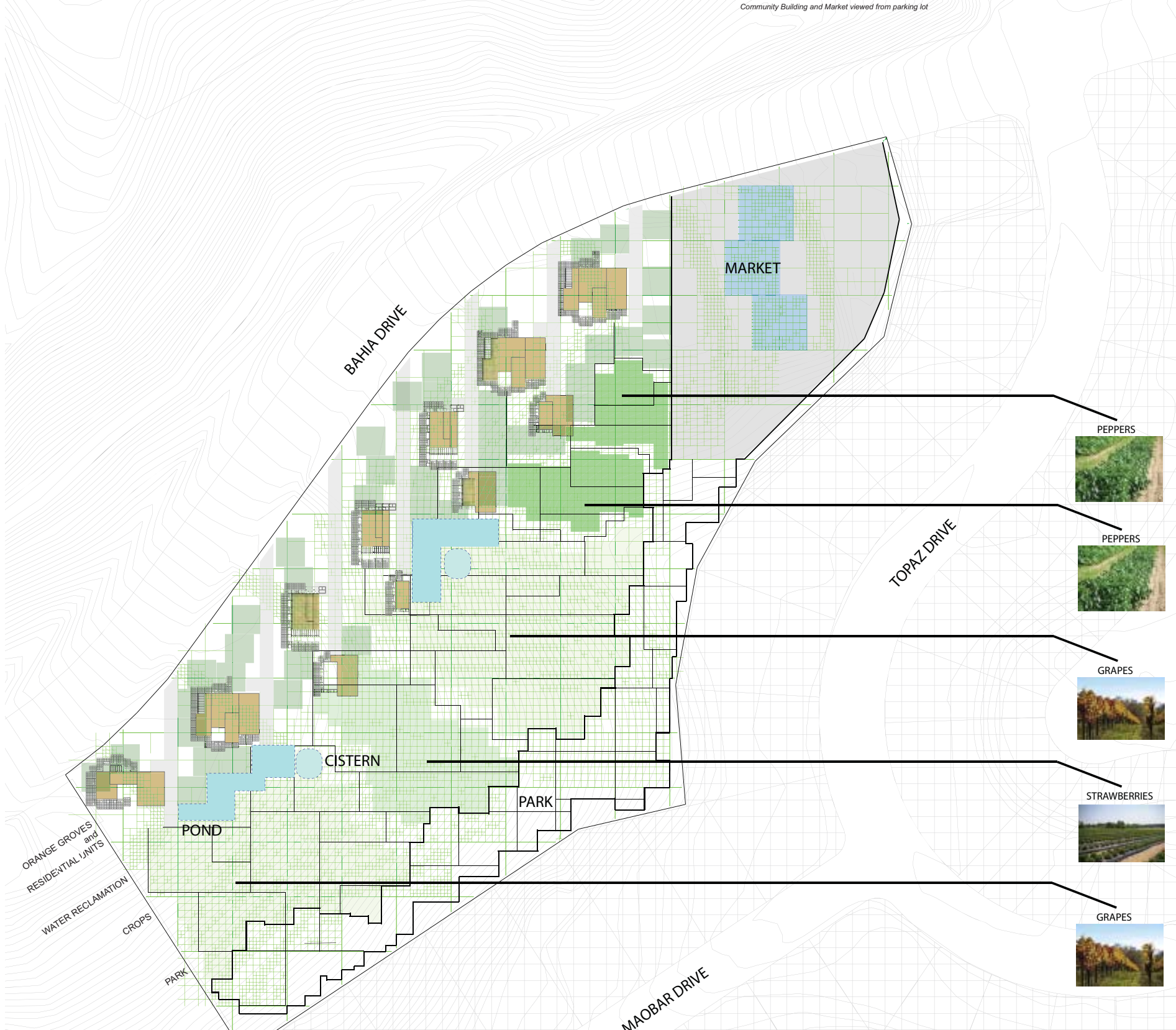
	UNIT COST	EXTENDED PATIOS	RETAINING WALL/SITE WORK	TOTAL
2 Bedroom W/guest	\$488,000	\$17,940	\$66,000	\$571,940
2 Bedroom	\$483,000	\$11,100	\$72,000	\$566,100
1 Bedroom W/guest	\$420,000	\$17,800	\$54,000	\$491,800
1 Bedroom	\$768,000	\$21,000	\$108,000	\$897,000
Studio W/guest	\$942,000	\$52,800	\$108,000	\$1,102,800
Open Air Market	\$745,000		\$58,000	\$803,000
Exterior Walkways, Paving, Roadways And Infrastructure				\$305,000
-SITE 1				\$356,000
-SITE 2				\$5,093,640
<b>TOTAL PROJECT COST</b>				

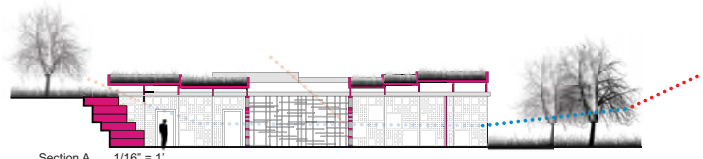


The Solar Pyramid and Land Form

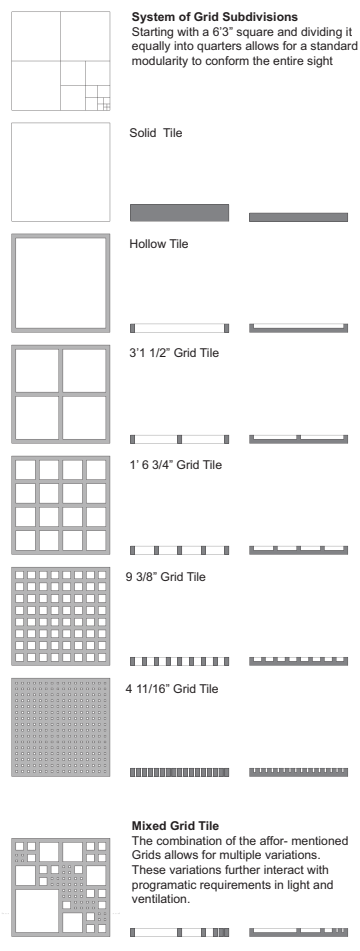
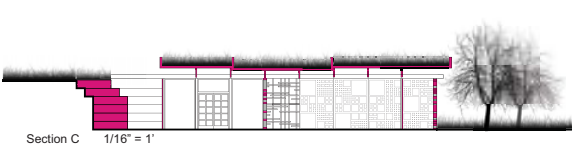
# OFF THE GRID

## A SUSTAINABLE STRATEGY FOR RESIDENTIAL FARMING

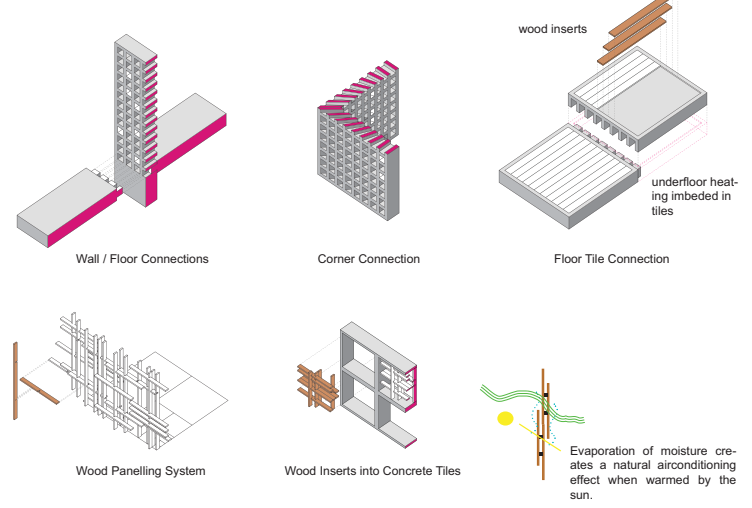




Section A 1/16" = 1'  
Retention Planted wall with in the house.  
Air cooled by orange grove shade and shaded veranda enters the house through the MASHRIBIYA embedded in the concrete panels.



Joint Connection Construction Methods



**DAY LIGHT SURFACES**  
The individual dwelling units are designed to maximize the utilization of daylight throughout the interior surfaces of each space. One of the major causes of visual fatigue for the aged eye is brightness contrast, often the result of uneven distribution of light throughout an interior space. Brightness contrast can also result from a dimly lit interior with a view to a highly lit exterior space. By providing for the entrance of daylight from multiple exposures, light will be evenly distributed, reducing the possibility of brightness contrast. In this proposal this is achieved by a combination of wood and concrete screens located on the exterior walls. These screens visually baffle harsh exterior illumination.

**RETENTION WALLS and SCREENS**  
Since the homes are built into the sloping areas between the existing terraces, they will be largely made up of retention walls. These retention walls are composed of large tiles that hold earth with in them, and as they step back the earth is revealed and allowed to be planted, so the kitchen herb garden will be planted with in the kitchen wall.

**THE MASHRIBIYA**  
The wood components of the daylight screening systems also function as a passive cooling mechanism. In Hassan Fathy's book, Natural Energy and Vernacular Architecture, he discussed the exterior wooden screens used in equatorial regions to block the high, harsh sunlight. These screens, called mashribiya, are constructed of small pieces of wood which have been 'turned' to form a circular cross-section. The mashribiya have a very fine scale and pattern. This refined scale filters the sunlight without causing a strong brightness contrast. In addition to filtering light, the wood construction of the mashribiya also helps to temper the climate. The wood naturally absorbs moisture; as the direct sunlight strikes the wood, it heats and releases the moisture. As the moisture is carried through the air, it creates a natural air conditioning.

It is proposed that the home interiors will be shielded a mashribiya Constructed of concrete frames and wood infill. These make up the exterior walls. There will also be exterior veranda like spaces which expand the interior space, and these will be walled by sliding glass doors and enclosed by full wood mashribiyas.

**SCREEN PATTERNS AND CONSTRUCTION SYSTEMS**  
The pattern of the wood and concrete screens would be derived from the bifurcating grid system that generates the form of the landscape. This patterning system coupled with a modular construction system allows for endless variation within walls, screens, and retention walls.

