Plans

Row House

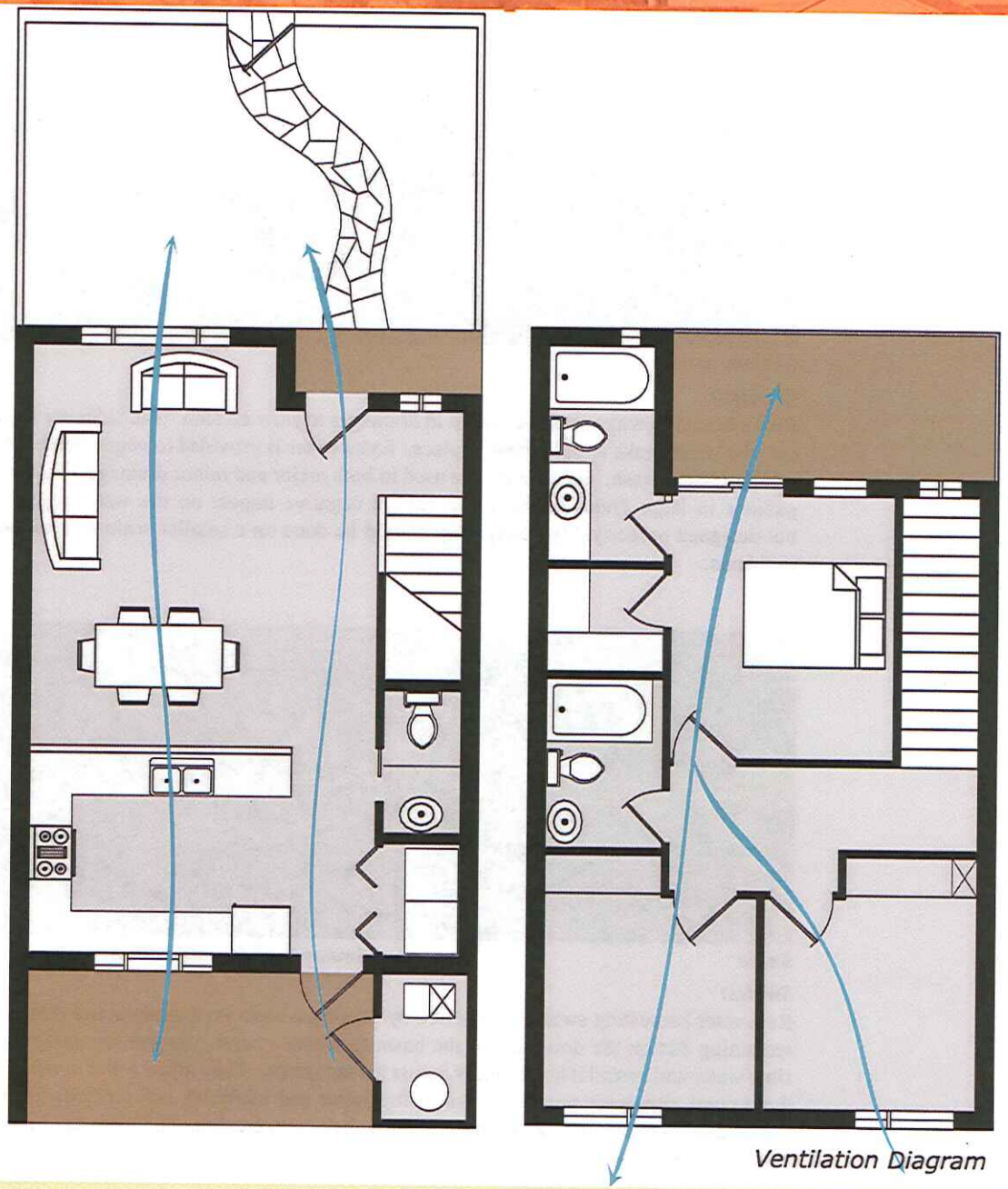
Features	Livable Area	
3 Bedrooms	Interior (conditioned space)	1185 s.f.
2.5 Bathrooms	Exterior (patios and balconys)	224 s.f.
	Total	1409 s.f.

Goals

- This house separates a primary entrance that is public and a secondary back entrance that is private. This is important for its location on the site. This condition allows the unit to front on the common spaces and yet be privately accessed for more utilitarian purposes from the roadway.
- This design promotes neighborly interaction which builds community through a semi-private yard.
- Because the yard space is at the front of the unit, as opposed to the back of the unit, the buildings can be set farther apart from each other increasing the readable volume of the common spaces.
- Having the unit face the common space provides eyes, ears, and legitimate activity to occur in these spaces making it more pleasant, safe, and welcoming.

Row House

Schematic Housing Designs



Ventilation Diagram

Strategies for a sustainable design

- The row house (or town house) concept is inherently efficient because it shares walls. This means there is less exterior wall area exposing the unit to higher temperature differences.
- A two-story unit reduces the environmental impact by using a small footprint for a bigger house. It also requires less roof area.
- Operable windows are placed on the north and south facing walls for views and for control of daylight in the space. Appropriately sized overhangs allow winter sun in to heat the space and blocks summer sun.
- This is a compact house that maximizes opportunities for outdoor living, significantly increasing the usable square footage without burdening environmental control systems or increasing energy demands.
- Openings in the building envelope are placed opposite each other to promote cross-ventilation through the spaces. Natural ventilation provides an increase in air velocity which leads to heat loss through convection and evaporation.
- This design allows water to sheds off the roof onto permeable surfaces and basins in the yard which irrigates the vegetation and recharges the water table.

Water Harvesting - Benefits and Methods

Harvesting water involves the capture, diversion, and/or storage of rainwater for irrigation and other uses.

Benefits of rainwater harvesting:

- Conserves groundwater and reduces water costs
- Reduces local flooding and drainage problems
- Flushes salt buildup
- Decreases landscaping and property maintenance needs
- Provides excellent quality water for many uses

Methods of rainwater harvesting:

- Gabions
- Swales
- Permeable surfaces
- Cisterns
- Retention Basins

Gabions in use

Gabions:

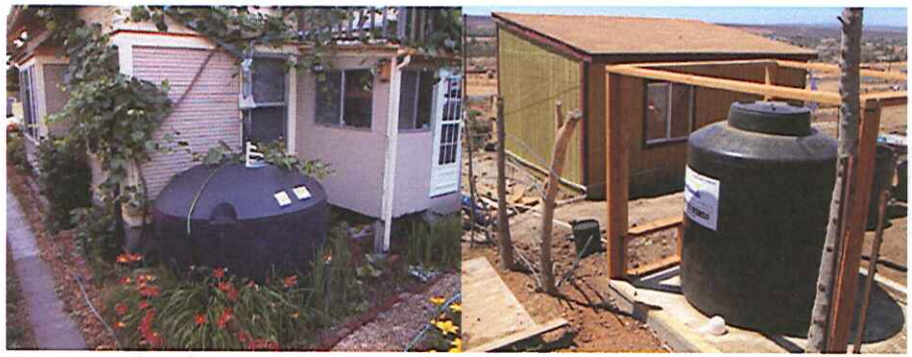
Rocks bound in wire mesh are placed in drainages to slow erosion. The sides are keyed into the wash banks to hold them in place. Extra water is provided to vegetation both in and beside the wash. Gabions can be used in both major and minor drainages; however, gabions in large drainages have can have a negative impact on the water regime if not designed properly. Typically, they should be done on a smaller scale to avoid any problems.

Swale

Swales used for arid agriculture

Swales:

Rainwater harvesting swales are created by digging a basin on a contour and piling the remaining dirt on the downside of the basin to create a berm. Swales are designed to slow water and spread it horizontally across the landscape. They allow water to soak into the ground, supplying vegetation with extra water and inhibiting soil erosion. Swales can be used in planting areas or on roadsides to help with erosion. The berm can become a place for pathways.



Cisterns

Cisterns:

Cisterns are receptacles for holding rainwater that is typically collected from rooftops of buildings. Cisterns can sit on top of houses, on the ground, or be buried below ground. Some come prefabricated, but they can also be made easily. They should include a filter to keep mosquitoes and debris out. Water collected is good for irrigation purposes.

Grass-Crete Permeable Pavers

Permeable surfaces:

Pervious materials such as granite, gravel, and open paving blocks allow water to soak into the soil. Using pervious materials for parking areas, plazas, pathways, and even roads would allow water to penetrate into the ground and also soften the landscape.

Retention Basins

Retention Basins:

Retention basins, also known as retention ponds, are small earthen depressions used to harvest and hold rain water for a limited period of time. Other functions of retention basins are to filter out sediments from the held water (also to filter pollutants if it is a bioremediation retention basin) and to replenish ground water sources. They are often used to increase localized ground water replenishment around large developed sites that often have little permeable surfacing. Retention basins should be built where stormwater usually collects. They are often used for areas over 20 acres, but they can be modified for smaller scale applications.

Water Harvesting Sources:

Handbook of Water Sensitive Planning and Design, Robert L. France, Ed. Lewis Publishers: Cambridge, 2002.

"Retention Basins", Ministry of the Environment, British Columbia, Canada. July, 2007. http://www.em.gov.bc.ca/Mining/MiningStats/Aggregate%20BMP%20Handbook/BMPs/Retention%20Basin.pdf.

"Water Harvesting Guidance Manual", City of Tucson, Department of Transportation, Stormwater Management Section. October, 2005.

"Water in the Tucson Area: Seeking Sustainability", Water Resources Research Center, College of Agriculture and Life Sciences, University of Arizona. July, 2007. http://ag.arizona.edu/AZWATER/publications/sustainability/report_html/chap4_02.html.

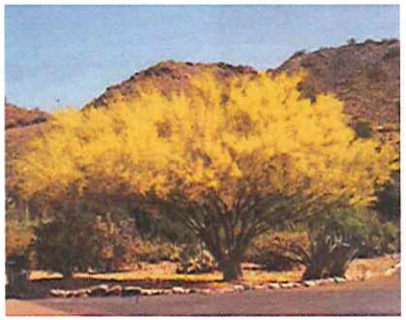
Trees

Velvet Mesquite, ***Prosopis juliflora***
Can grow up to 25' tall. Wildlife eat beans. Blooms yellow in spring.

Lacebark Elm, ***Ulmus parvifolia***
Can grow up to 70' tall with a spread up to 50'. Hardy, drought tolerant tree providing medium to dense shade and modest fall color. Growth rate is moderate to rapid.

Desert Willow, ***Chilopsis linearis***
Normally under 15' tall. Blooms white and purple with yellow interior April-September.

Cat Claw Acacia, ***Acacia greggii***
Can grow up to 20' tall. Blooms yellow in spring. Provides habitat for wildlife.



Blue Palo Verde, ***parkinsonia floridum***
Can grow up to 25' tall. Blooms yellow in early spring.

Emory Oak, ***Quercus emoryi***
Can grow up to 50' tall. Blooms green dangling male flowers, or tiny female flowers followed by acorns in spring.

Shrubs

Jojoba, *Simmondsia chinensis*
Large shrub, full sun and reflected heat, dense branching and fruits make it a popular species for fauna.

Desert Cassia, *Cassia nemophilia*
Medium to large shrub, yellow blooming flowers, full sun and reflected heat. Tolerates frost.

Fairy Duster, *Calliandra eriophylla*
Small shrub to medium shrub, white to red blooming flowers, full sun, attracts pollinators.

Gray Thorn, *Ziziphus obtusifolia*
Medium to large shrub, full sun, the fruits are enjoyed by native birds such as Gambel's quail.

Chuparosa, *Justicia californica*
Small shrub, red blooming flowers, prefers partial sun to full sun.

Brittlebush, *Encelia farinosa*
Can grow up to 25' tall. Wildlife eat beans. Blooms yellow in spring.

Wildflowers

Desert Globemallow, *Sphaeralcea ambigua*
Small perennial shrub. 3' tall; woody base; blooms throughout year. Attracts native bees and is a larval food plant for butterflies.

Desert Marigold, *Baileya multiradiata*
Small shrub, 2' tall orange blooming flowers. Blooms March-October. Attracts Birds and Insects.

Devil's Claw, *Proboscidea parviflora*
Groundcover to small shrub, yellow to pinkish-purple flowers that can be quite large, the flowers are heliotrophic, partial to full sun.

Parry Penstemon, *Penstemon parryi*
Small perennial shrub up to 4' tall. Blooms pink March-July.

Mexican Evening Primrose, *Oenethera berlandieri*
Small shrub to groundcover. Pink blooming flowers. Attracts wildlife.

Mexican Gold Poppy, *Eschscholtzia mexicana*
Small annual shrub. Blooms mid February-May.

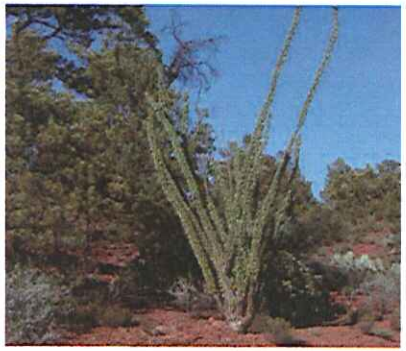
Cacti & Succulents

Banana Yucca, *Yucca baccata*
Blooms white in spring and summer. Was an important food source for indigenous peoples.

Prickly Pear, *Opuntia phaeacantha*
Blooms yellow to yellowish-orange in spring. Important food source for wildlife.

Christmas Cactus, *Opuntia leptocaulis*
Normally grows to 3' tall. Blooms greenish-yellow in spring. Great for dry slopes.

Hedgehog Cactus, *Echinocereus triglochidiatus*
Groundcover to small shrub, red to purple flowers, full sun, tolerates reflected heat, edible fruits. Flowers stay open overnight.



Ocotillo, *Foquieria splendens*
Can grow up to 20' tall. Blooms bright red in spring and summer.

Tonto Basin Agave, *Agave delamatari*
A large agave can grow up to 39" while the flower stalk can be up to 20' high. Blooms yellowish-green at first then purple-maroon.

PARKWAY HOMES

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