PRESCOTT MIXED USE REDEVELOPMENT AREA

INSTODUCTION

We have been asked a council member of the City of Prescott to create a conceptual plan for the proposed redevelopment area close to the existing downtown.

In broad terms the concepts are as follows:

- To create an area near downtown Prescott that will act as a hub for a variety of outdoor activities helping to develop awareness of the outdoor opportunities available in Prescott.
- To enhance Granite Creek that bisects the site while exploring and incorporate concepts of Neo-urbanism for an interface between commercial, housing, retail spaces and nature.
- To explore the possible rezoning of the are to allow for mixed use and other planning strategies to a lively area that can complement the downtown and bring additional revenues to the City of Prescott.
- To crease a walkable neighborhood with multi-modal transit throughout.
- To anchor the development with emphasis on small retail shops in support of local businesses.

The design concept should demonstrate the current and forward thinking practices in mixed-use development, with the goal of becoming a model for the redevelopment of these kinds of under-utilized areas.

The expectations for Ecosa final projects are high quality maps, drawings, renderings and presentations of a professional nature.

The final concept will be presented to the City Council and staff. This project is an opportunity to educate and influence hoe the future Prescott AZ may develop and change in a sustainable direction.

SITE DATA

Located in the heart of Prescott AZ, this project is approximately 140 acres in extent. It is bounded by North Montezuma Street to the West, the

Yavapai Tribal lands on the East, and East Merritt St. to the North. The Southern boundary is the property line of businesses that are accessed from EZ Street of from North Mount Vernon Street. Albertsons shopping center and the Springhill suites define the East corner. Currently most of this area is industrial and many of the existing buildings are vacant and the land not well utilized.
As a long term strategy, the City of Prescott would like to spur development in a new industrial area near the Prescott Airport and is therefore encouraging businesses along 6th Street that consist of industrial/ construction, remodeling, manufacturing uses to relocate to the airport's industrial park. This will have a duel impact; free up 6th Street for redevelopment and spur the use of the industrial area at the airport. The removal, remodel, or new construction of buildings must be supported by strong rationale and supporting data. The existing infrastructure of roads must be maintained, however simple modifications can be made to encourage a multi-modal transportation corridor for pedestrians, cars, bikes, public transit and alternative methods, alike.

Granite Creek bisects the site area and is a highly utilized and highly valuable water way. At the West end is Granite Creek Park and to the East the creek bed narrows and is crowded by industrial buildings, trailer parks and fences. Creek Rehabilitation and increased connection to the creek are important elements of this design concept.

SITE

Our site design harnesses the area of both the natural habitat and the built environment, while creating a comprehensive network of streets, pedestrian/bike paths, and park trails that allow for convenient, car-free trips around town. As 6th Street is located in a water-constrained climate, our team also emphasized water harvesting throughout the site. Using native plantings and the location of buildings, greenhouses, and urban agriculture.

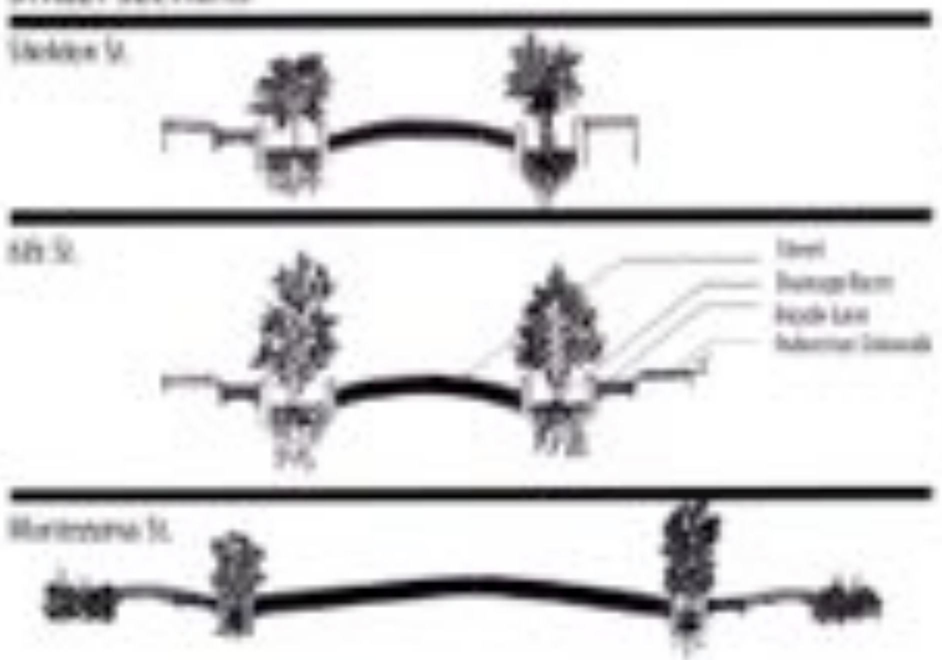
SNAPSHOT

PROJECTED POPULATION (2035):	2,500
PROJECTED EMPLOYMENT (2035):	1,235
TOTAL BUILDING FLOOR AREA (SQ. FT):	1,855,800
TOTAL SITE SIZE (ACRES):	145

PETAL IMPERATIVES	LOCAL CONSTRAINTS/PLANT ADAPTATIONS	6th STREET STRATEGIES FOR ADAPTATION
Limits to growth, Habitat Exchange, Car Free Living, Urban Agriculture	*Lack of Water Availability *Half Month of Flood *Climate Influence on scarcely extreme temperature extensive *Creation and Utilization of Microclimates *Ability to dispense and pollinate using cell or the energy flows or animal "vehicles"	*Limited Population Based on Water Availability *Skeletal Building Framework to Allow for Gradual and Adaptive Infill *Climatic Design Based on Passive Solar Orientation and Topography of Site *Creation and Utilization of Microclimates *Encourage walking, biking or public transport

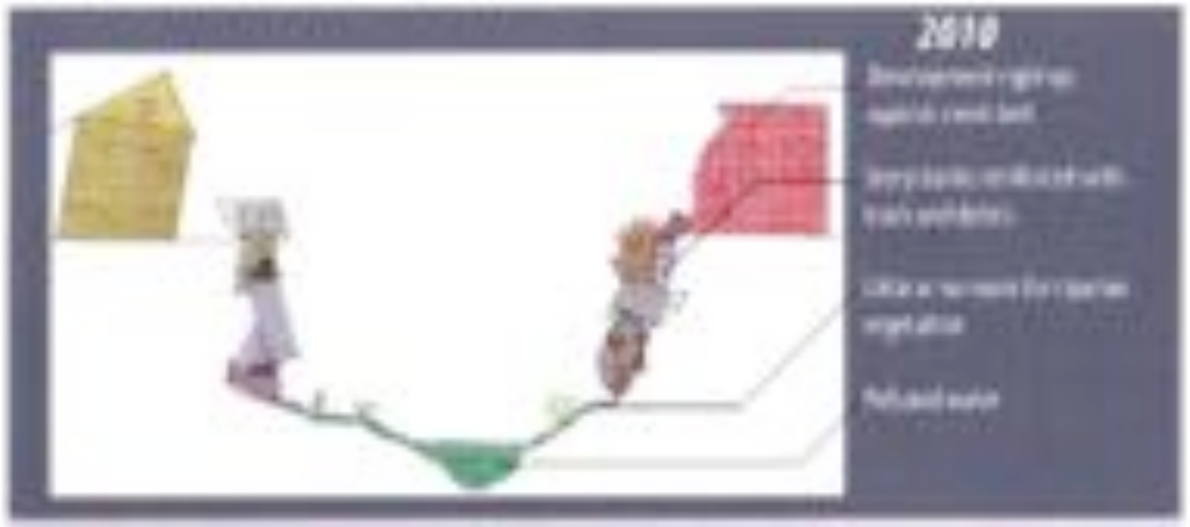
RESTORE CONNECT SAFETY ACCESS PUBLIC COMMUNITY RESPONSIBILITY

STREET SECTIONS



REGIONAL TRANSIT

RIPARIAN RESTORATION



SCALE JUMP: AGRICULTURE

WATER

With two annual rainfall and a threat of increased aridity with climate change, the 6th Street water system was a driving factor behind our design. Rain catchment + water reused through greywater and seasonal cluster systems that turn all architectural roof buildings, outdoor landscaping surfaces adjacent and recessed through passive storm runoff catchment, and the majority of agriculture is located adjacent to living space to provide for a constant greywater supply. However, the keystone to the success of our water system is a network of decentralized living machine wastewater purification and treatment systems - "Integrated Reclamation Centers", which allow for much less cycling of the water supply.

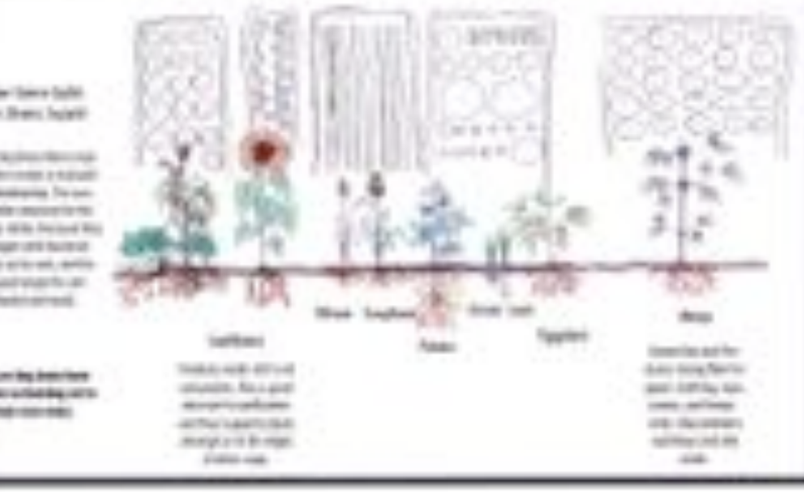
SNAPSHOT

ANNUAL ONSITE RAIN CATCHMENT:	14,900,000 gallons
ANNUAL CONSUMPTIVE WATER USE:	7,800,000 gallons
ANNUAL WATER SURPLUS:	7,100,000 gallons
POTENTIAL GREY-WATER IRRIGATED LAND/GREENHOUSES:	8 acres

PETAL IMPERATIVES	LOCAL CONSTRAINTS/PLANT ADAPTATIONS	6TH STREET STRATEGIES FOR ADAPTATION
Net Zero Water Use	*Adaptive photosynthesis to reduce evapotranspiration by separating chemical cycles or only opening stomata to intake CO_2 at night *Waxy or reflective leaves to mitigate heat *Root dispersal both horizontally and vertically to maximize access to water *Structure of plant to direct water towards base of plant *Circulation and oxygenation of microclimates *Ability to store water during extremes heat and dryness	*All water needs met through rainwater capture and closed loop filtration systems *Vapor assisted greenhouses to re-condense freshtranspiration while filtering water through constructed wetlands and growing food *Shaded spaces and cool microclimates to buffer extreme heat *Temporary shade structures to maximize rainwater capture during rain events

TREATMENT CONSERVATION PASSIVE ADAPTATION LOW TECH FLOW REUSE LIFE

DRYLANDS FARMING CROP VARIETIES



STREET BASINS

Basins along the street not only create a productive, biophilic environment, but also produce food, mulch, and filter water from the street before it percolates into the ground.

Semi-permeable glass screen made from recycled glass conglomerate

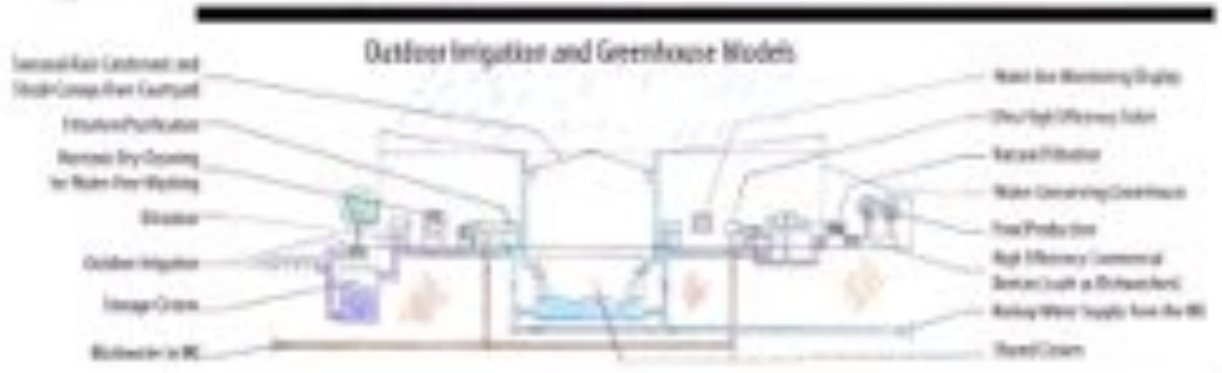
Crowned street to direct stormwater towards basins

Mulch basins with fruit tree and canyon grape plantings utilize and filter stormwater contaminated by the streets and sidewalks

WATER CONCEPT DIAGRAMS

All water will be harvested on site, a particular challenge in the arid Southwest. The diagrams below represent combinations of potential strategies for water cycling. Note that this various strategies represented can be viewed and mixed/matched in a variety of ways, in order to fully supply the water needs of the IRC district, roof rainwater collection will be supplemented with other non-off of other structures, as represented below. Additionally, a portion of the wastewater will be fully purified on district facilities for re-use, creating a closed-loop system.

Key:



HEALTH

PETAL IMPERATIVES	LOCAL CONSTRAINTS/PLANT ADAPTATIONS	6th STREET STRATEGIES FOR ADAPTATION
Fresh Air, Daylight, Biophilia	*Oxygen release while sequestering carbon *Locally sourced energy and nutrients *Absorption and mitigation of air pollutants *Creation of conditions conducive to other forms of life	*Passive solar design to ensure natural daylighting *Street side plantings to absorb carbon, toxins and heavy metals from vehicles *Local food production connects people to their dietary needs and promotes healthy eating habits *Local food production and native plantings create an inherently biophilic environment *Increased riparian habitat to attract and support wildlife

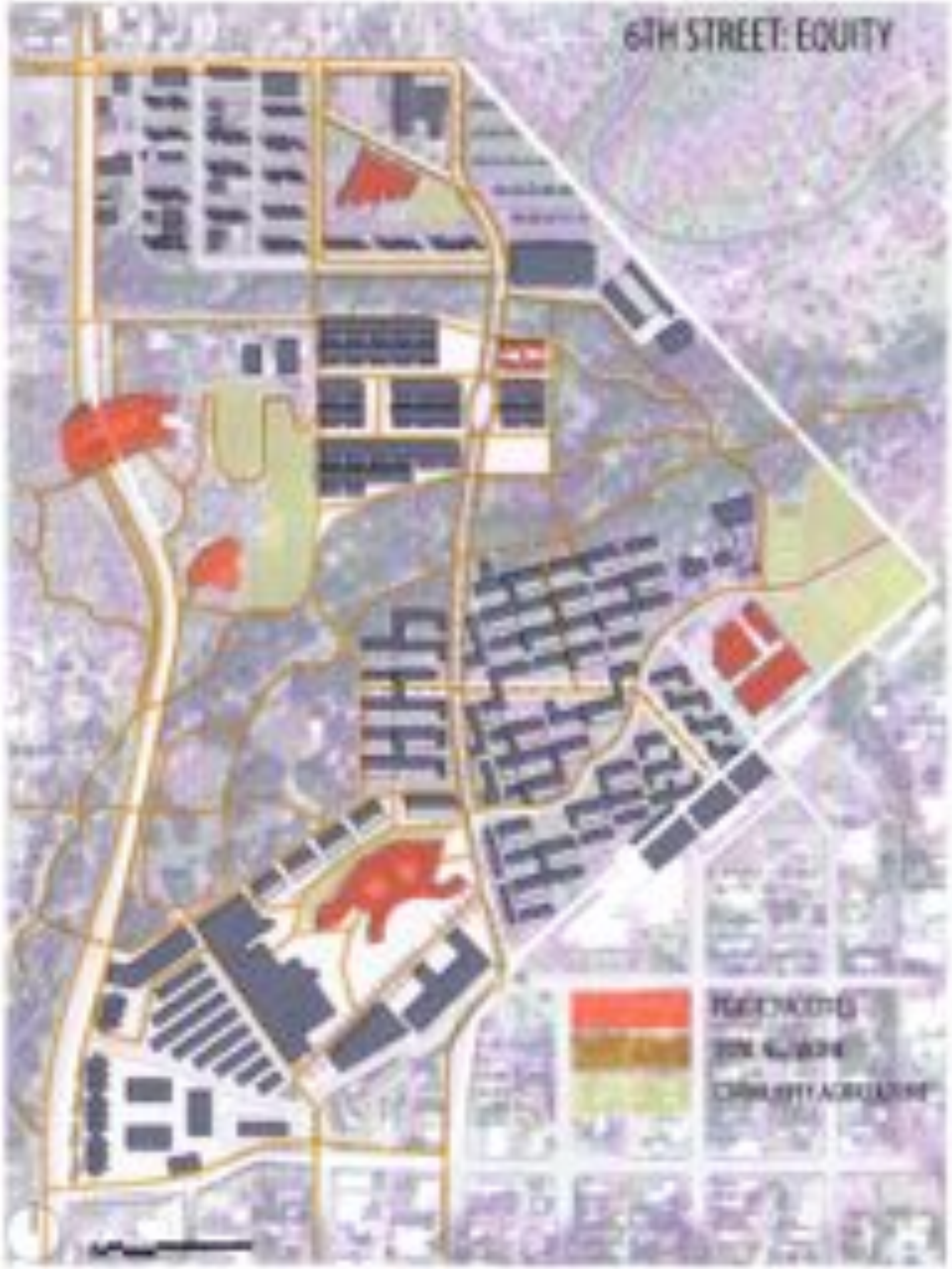
FRESH AIR DAYLIGHT ORGANIC LOCAL NATIVE BIOPHILIA OUTDOOR SPACES

EQUITY

The equity petal addresses how the design incorporates systems to provide equal access to everyone regardless of age, race, gender, disabilities, religious or political views. By providing dispersed affordable housing through work trade programs and the option to creatively infill an existing structural frame, residents have the choice to offset their costs by working on community projects. In addition, street furniture, varied community gathering spaces, and ample access to natural settings and local food all contribute towards the goal of equity.

"LICHEN"

Like lichen, colonizing spaces otherwise devoid of life, public art spaces give local artists opportunities dispersed around 6th Street to beautify their community, and articulate creative expression.



PETAL IMPERATIVES	LOCAL CONSTRAINTS/PLANT ADAPTATIONS	6th STREET STRATEGIES FOR ADAPTATION
Human Scale Opposed to Car, Affordable Housing, Street Furniture, ADA, Rights to nature	"Every plant occupies a niche within a larger community, often times forming mutualistic relationships to foster more efficient and resilient growth	*Different housing options for varying incomes and types of people *Skeletal building framework with individual infill to promote diversity and affordability in building typology *Subsidized rent based on work trade programs to encourage community building projects, agriculture and maintenance

EDUCATION AFFORDABILITY ACCESS EQUALITY INTEGRATION COMMUNITY NATURE SAFETY

ENERGY

Located in a sunny but temperate climate, Prescott is the ideal location for solar energy production. Proper site design, building insulation, a localized smart grid, and efficient technologies will enable all energy needs to be easily met through photovoltaics and solar hot water arrays located on built structures. The only exception is cooking fuel, which will be supplied through methane collected from anaerobic digestion of human waste at the wastewater treatment plants. Night/day cycles of solar availability will be mitigated through distributed energy storage centers utilizing a variety of technologies and an integrated electric vehicle to grid storage system.

SNAPSHOT

ELECTRICITY NEEDS FOR 6TH STREET AREA:	14,500 MWh
HOT WATER NEEDS FOR 6TH STREET AREA:	9,300 MWh
% OF TOTAL SITE ROOFSPACE NEEDED:	36%

Designed with topography, spacing and SE orientation in mind to provide sunlight for steps during growing season

Using the topography of the hill to allow solar access

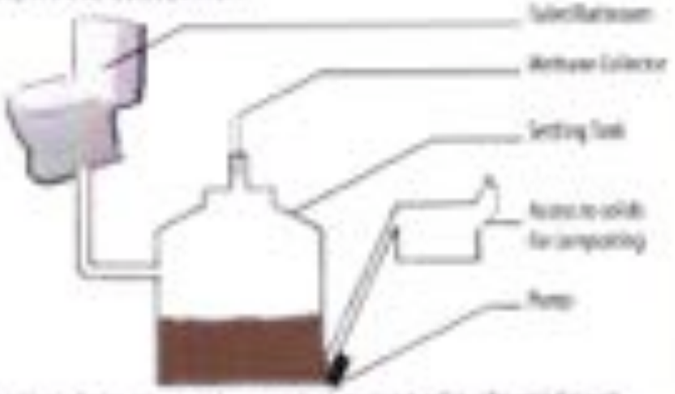
SE orientation and correct spacing allows ample sunlight to reach every unit

PETAL IMPERATIVES	LOCAL CONSTRAINTS/PLANT ADAPTATIONS	6TH STREET STRATEGIES FOR ADAPTATION
Net Zero Energy Use	*All energy absorbed from sunlight *Energy cycled as nutrients, calories, or heat through ecosystem via direct consumation, decomposition, or ignition	*Passive solar design to capture heat energy within buildings and store it in thermal mass *Active solar technologies produce enough electricity for site *Anaerobic digestion of sewage waste to produce methane for cooking or other activities necessitating flame

RENEWABLE CONSERVATION DISTRIBUTED APPROPRIATE PASSIVE LOCAL

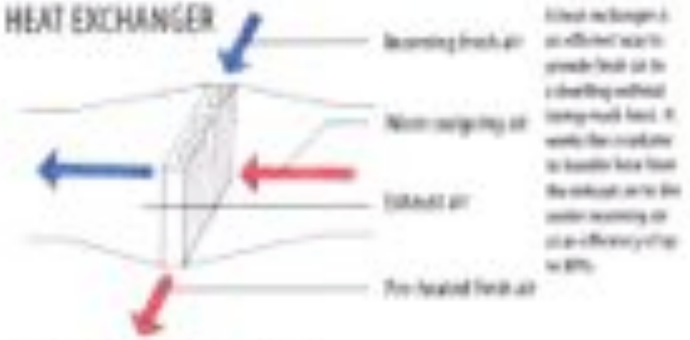
PASSIVE METHODS

METHANE COLLECTION



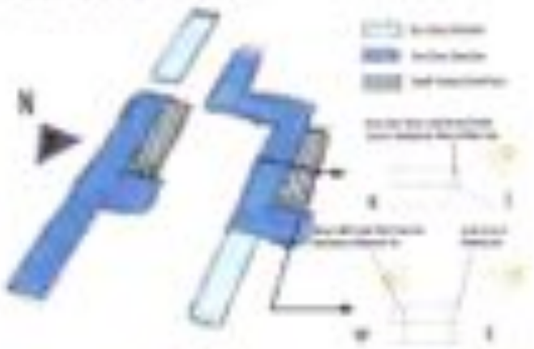
A methane collection system works by converting human waste and any other vegetative waste through anerobic decomposition. The anaerobic produces methane and CO_2 as by-products. Given these are gases lighter than air, they collect at the top of the settling tank and methane can be used as a combustible fuel. Once here, the waste makes its way to the bottom of the first tank and is pumped into a second tank where it can be accessed for composting.

HEAT EXCHANGER



A heat exchanger is an efficient way to provide fresh air to a dwelling without losing much heat. It works like a radiator in reverse: heat from the exhaust air is transferred to the incoming air via a efficiency of up to 80%.

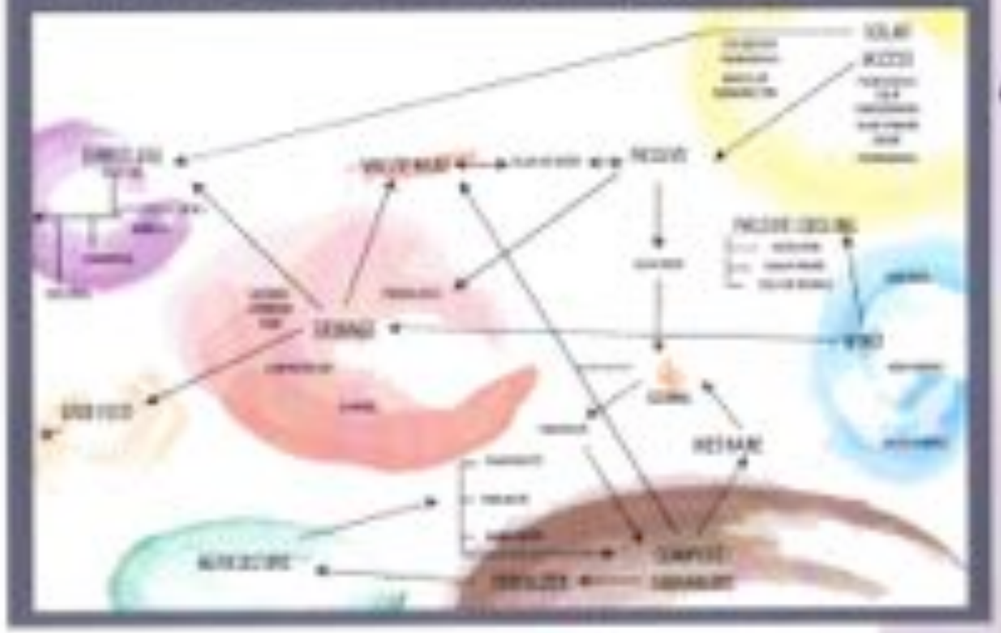
PASSIVE SOLAR DESIGN



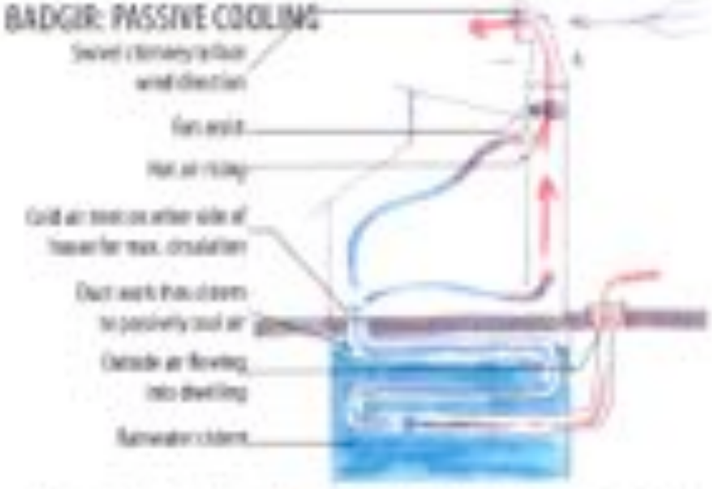
All sites in the 6th area, including the CZ (west district), are designed for maximum passive solar access. The building height, overhangs, orientation and spacing provide the full solar access to the southern, while shading out the low to western and summer sun.

SITE ENERGY FLOWS

This diagram shows the various methods of energy production and storage incorporated in our design. It also shows the connections, relationships and closed loop systems made by the different energy components of teh farm.



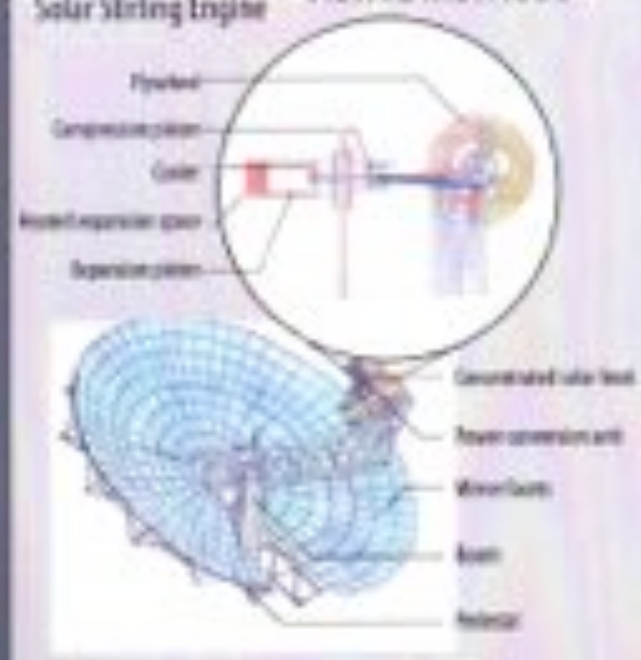
BADGIR: PASSIVE COOLING



Badgirs are historically used throughout the Middle East. We took the concept and adapted it to the South west climate. These passive ventilation systems are ideal for bringing cool air into the home during a hot day with minimal use of energy.

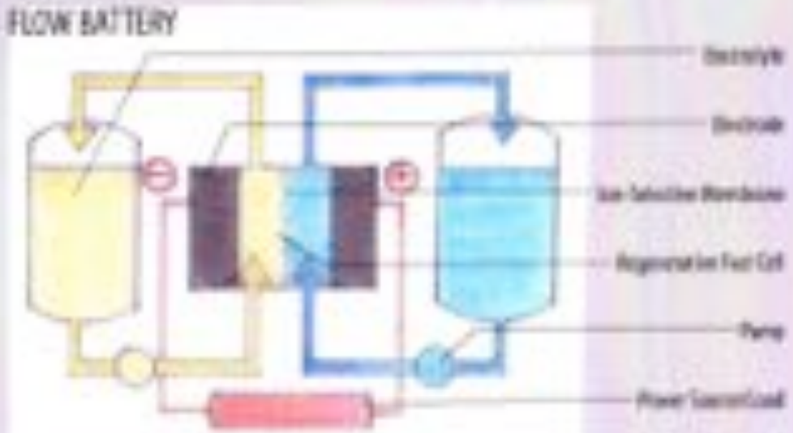
ACTIVE METHODS

Solar Stirling Engine



The Solar Stirling Engine is heated by a solar concentrating array which shines down a parabolic mirror that spins a flywheel to generate electricity. The beauty of this device is that it operates away from the issue of the sun-cycle so could be deployed at a northern/south scale.

FLOW BATTERY



A flow battery is a type of rechargeable fuel cell where ion exchange occurs over the lengthy energy generating electrolytes. The electrolytes can be easily changed out and re-energized for continued use.

BEAUTY

The beauty petal addresses the tender human need for aesthetic stimulation and involvement. Also, in order to bring people to 6th street we realized it was necessary to make it an attractive and vibrant place to be. By involving community members in street art, building/retrofit projects, and revelation of the natural environment we hope to encourage an organic emergence of a locally rooted aesthetic that represents both the cultural and ecological fabric of Prescott.

PETAL IMPERATIVES	LOCAL CONSTRAINTS/PLANT ADAPTATIONS	6th STREET STRATEGIES FOR ADAPTATION
Human Delight and Celebration of Culture, Street Art, Inspiration and Education, Biophilia	*Vibrant colors, intricate shapes and pleasant aromas attract pollinators *Seed dispersal reliant on animals involves nutritious or sweet and beautiful fruiting bodies	*Various features like community gardens, street art, murals, open houses and studio events serve to attract people who can then spread their inspiration, grow community and breed ideas for further beautification

EXPRESSION ARTISAN CREATE EMPOWER EXPLORE CULTURE INSPIRE PLACE

MATERIALS

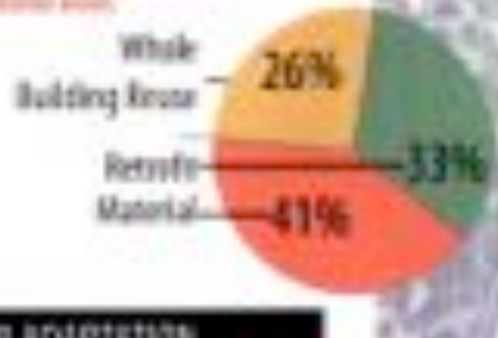
Our design first emphasizes feasible re-use and re-purposing of existing structures on the site. New construction will minimize square footage through compact and efficient design and utilize locally available materials. A re-use center located on the east side of the site provides a framework of re-use and re-purposing of building materials by residents, as well as education on deconstruction and re-use of buildings.

In order to maximize reuse and conservation of materials, we separated the existing buildings on our site into three categories.

1. Buildings that lend themselves to retrofits and work with our design.
2. Buildings that could be disassembled and rebuilt elsewhere.
3. Buildings that need to be used on an individual material level.

SALVAGE ARTS

Shared artist outdoor studio space with gallery/commercial storefront provides an outlet for reuse of on-site materials, beyond their intended initial use.

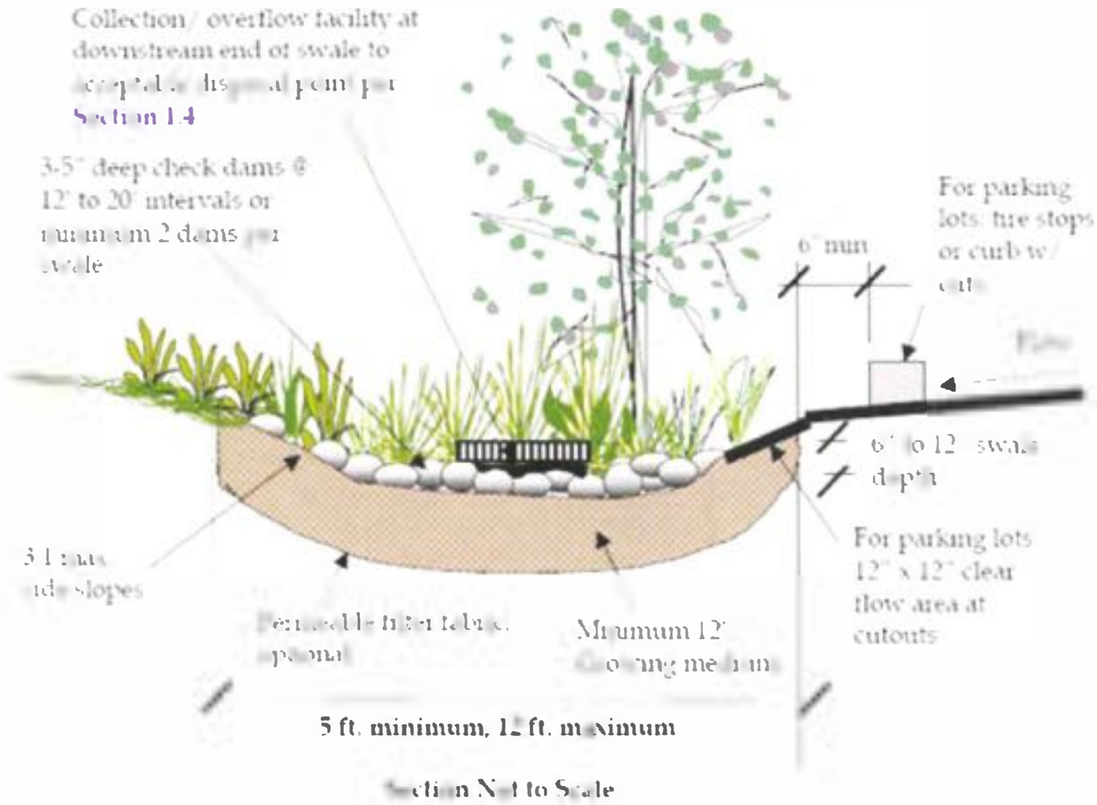


PETAL IMPERATIVES	LOCAL CONSTRAINTS/PLANT ADAPTATIONS	6th STREET STRATEGIES FOR ADAPTATION
Embodied Carbon, Responsible Industry, Re-use, Recycle, Regenerate, Appropriate Sourcing	*All plant material emerges as a product of photosynthesis combining solar energy with atmospheric carbon and nutrients from the soil along with water as a medium for circulation *All plant material cycled through decomposition and reabsorption unless consumed by an external agent such as an animal, human, or fire	*Cycling of materials through innovative re-use encouraged by scrapyard and recycling facility *Use of local resources and materials where possible

SALVAGE | REUSE | RECYCLED | RECYCLABLE | EARTHEN | LOCAL | ADAPTIVE | MODULAR

6TH STREET

Inspiration Photos



Bioswale Cross-Section

Bioswale, Portland

Gabion Dam

ART WALK

Public art path leading from downtown to 6th St. District

PATH MARKERS

Sidewalks painted

VEGATATION

Trees and plantings
to provide shade

BENCHES

Placed throughout
walk for rest areas

START POINT

Art walk begins at
The Raven

WELLNESS CENTER

Medical Center on 3rd Street

LIGHT TUBES

Passive way of transmitting light into shaded areas

OVERHANGS

Creating shade and cooler microclimates

TERRACES

Allow access to shops

SECOND-STORY WALKWAY

Bridge that creates addtional green space and shading; connects medical center to spa

ARTISAN CENTER

Training and retail space for local craftsmen

STUDIO AND LOFTS

Creates microclimate while providing housing

SPANISH-TILE OVERHANGS

Passive solar feature and shades windows for gardening

RETAIL SHOPS

Includes spa, shops, offices, medical services

RAINWATER CATCHMENT AND IRRIGATION

TRELLIS WALKWAY

Creates shade

OUTDOOR RECREATION

Connecting us with the outdoors

TRAIL SIGNAGE

Information about distance from the creek and QR Code

6TH ST. DWELLER

This could be you

MOUNTAIN BIKING TRAILS

Along Granite Creek

ECO-INDUSTRIAL PARK

Master Plan of an urban food initiative

CULINARY SCHOOL/BREWERY

Food materials can be sourced and recycled by urban farm

OFFICE/ FOOD STORE

Local value-added food products can be sold

BUSINESS INCUBATORS

Shared food processing machinery and business consulting to promote light local industries

KITCHEN WORKSPACE

MIXED-USE

Cottage industries in lower floor with housing above

LIVING SYSTEM

COMPOST DROP-OFF

Community drop off to be transported to larger facility

COMPOST BINS

LIVESTOCK

Chickens and goats

APIARY

Bee-keeping for local honey production

GREENHOUSES

Aquaponics, hydroponics, vermiculture, and food crops

N