FROM BROWNFIELD TO PERMACULTURE CITY

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Converting a brownfield site by creating a new community through increased density and sustainable permaculture.

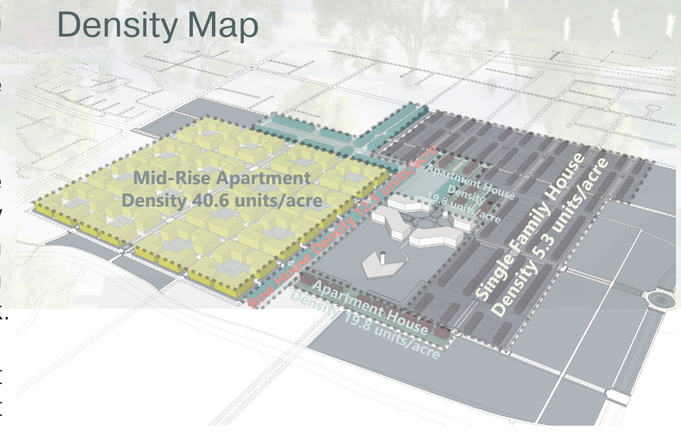
Project Statement:

A 280-acre brownfield site can be transformed into a permaculture city by finding the appropriate balance of density and substantial garden space to accommodate the site's population. Through density studies and programming spaces, an increase from .08 units/acre to 10.7 units/acre was established equally a site population of 7,326. This allows for adequate garden space on site to cultivate 1/4 of the required produce annually.

Providing a variety of dwelling options allows for a seamless transition from the surrounding infrastructure while creating a desirable community for all user types. By designing various sizes of gardens within the dwellings, the user has the choice on what types of produce they wish to grow. Also, by establishing a park system throughout, no dwelling unit is further away than a five-minute walk from a public park.

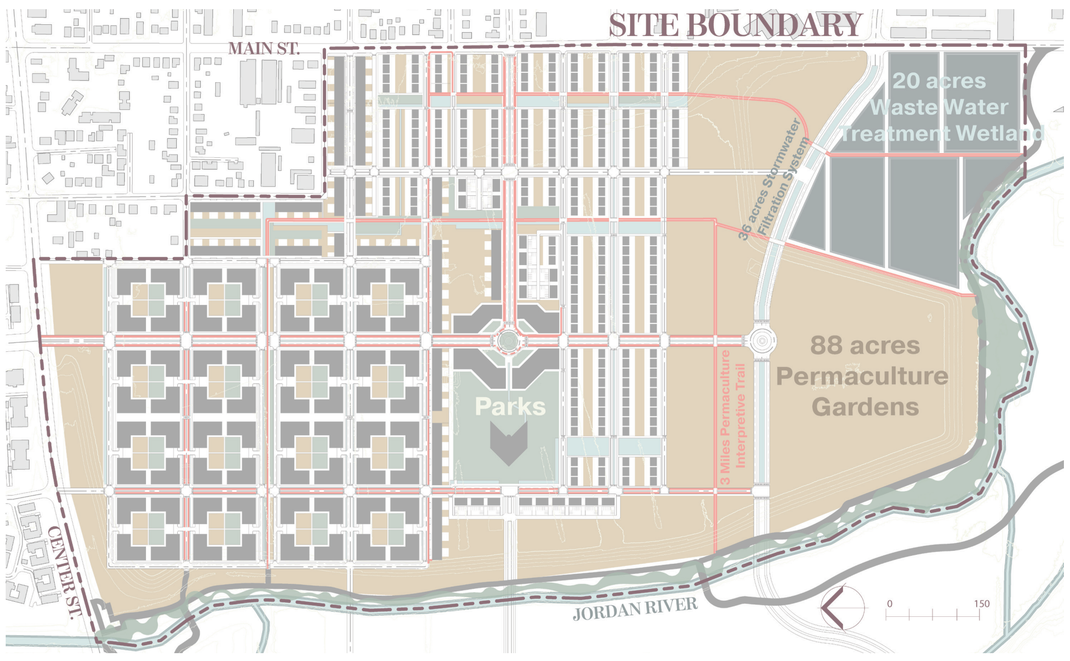
The commercial district and community center were consciously situated in the heart of the development. This allows for the residents to have a centrally located district filled with a multitude of amenities, but also creating a desirable destination for the surrounding metropolitan.

Density Map

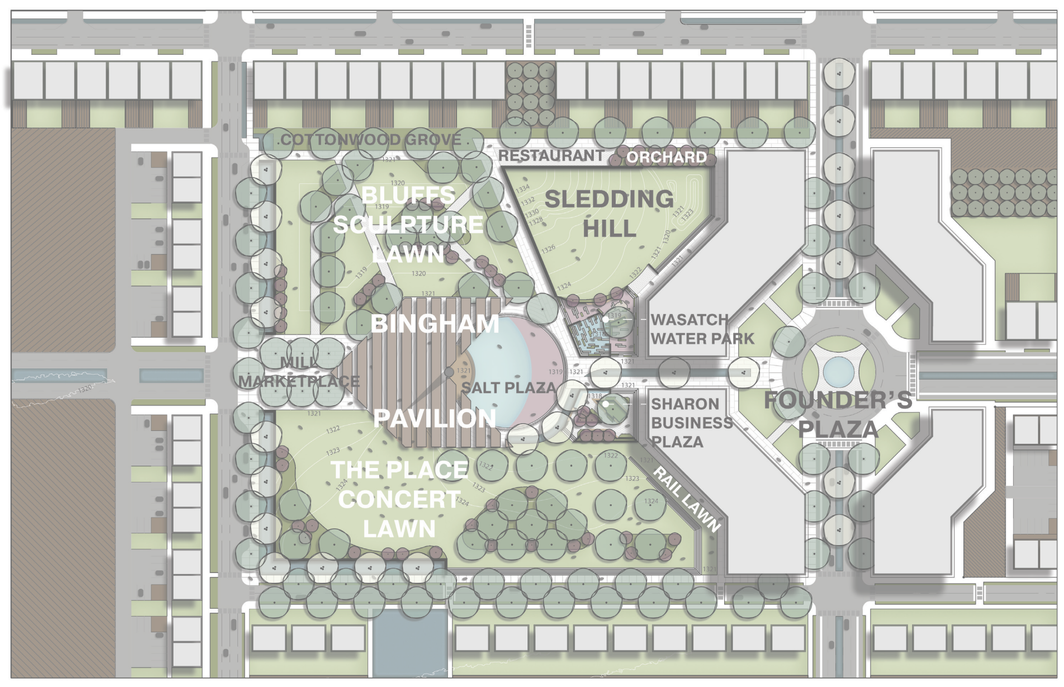


Location Maps

Master Plan



Site Plan



Project Narrative:

Recently, society is becoming aware of their wastefulness, unhealthy habits, and the substantial impact they have on the natural environment. The new trend in residential design is to have a portion of the yard for food production. This trend is very popular in urban settings, especially in the Greater Salt Lake City Metropolitan. It is experiencing restrictions as the population steadily grows and available land decreases due to geographical barriers surrounding the city.

Since the area is running out of room for development, cities are turning to the use of approved brown-field land that was once part of mining exploration for residential/mixed use developments to house the increasing population. Additionally, these cities have been proactive with sustainable design. Some developments have implemented solar energy collection while others have storm-water filtration systems. However, a permaculture driven sustainable community has not yet been done.

Investigating how a permaculture-driven design could be implemented within a community development on a brownfield site led to the following results. After studying the surrounding density, an increased from existing .08 units per acre to 10.7 proposed units per acre was determined to allow for providing four styles of housing options and community amenities. Housing options for the residents are: mid-rise apartment complex, rowhouse district, apartment house community, and single-family neighborhood. The 10.7 units per acre allows for an addition of 3,015 units and 7,326 residences. This density will allow for enough permaculture space to produce a quarter amount of site annual consumption.

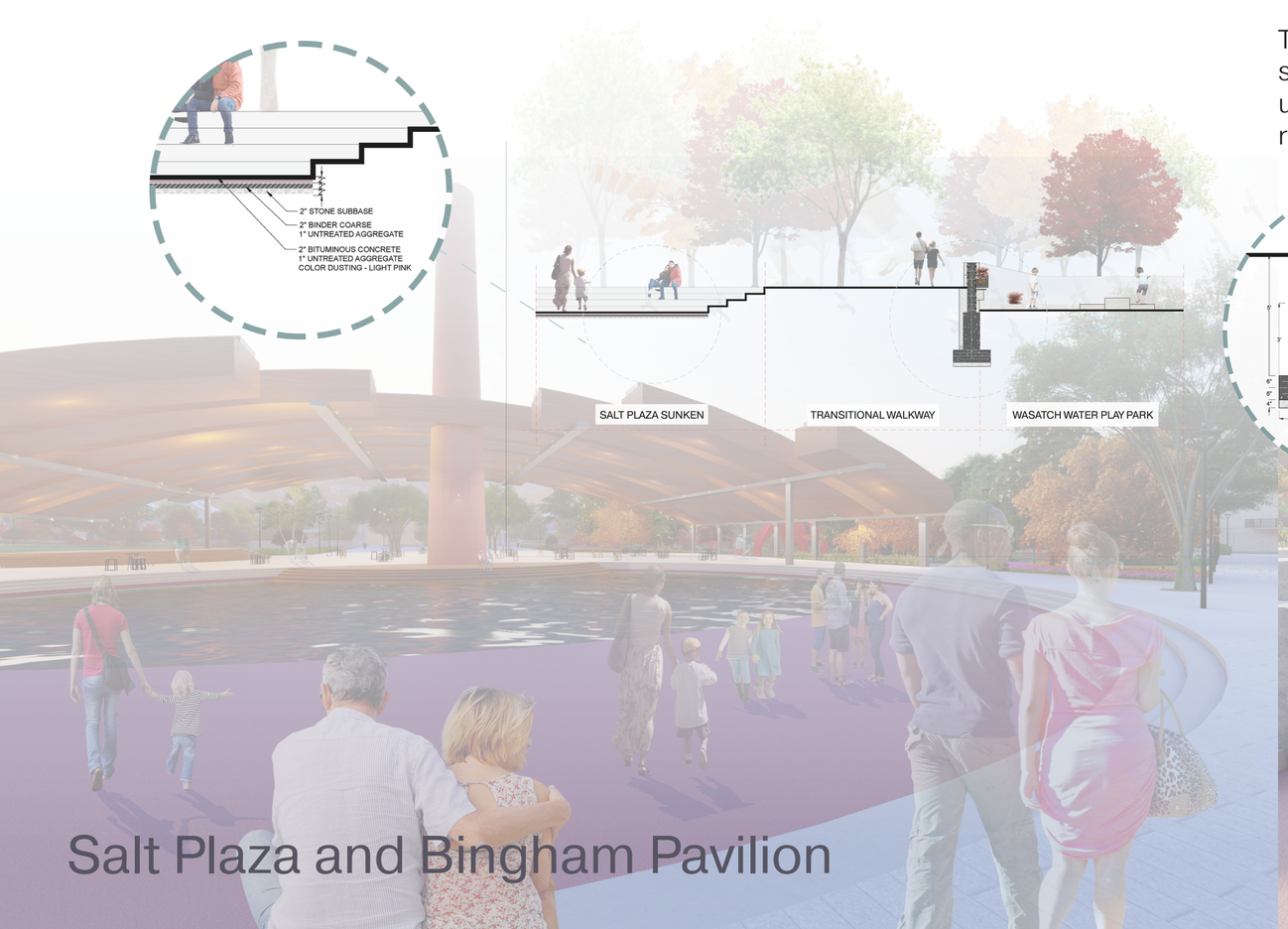
Located on the southeast corner of the site, is a man-made industrial swale that currently collects the site stormwater. Through vegetative filtration the water is cleaned from contaminants before entering the Jordan River. This 13-acre area is not suited for infrastructure or garden use due to the surrounding sloping basin. After calculating that 20 acres is necessary for an onsite, wastewater, treatment wetland, this area was determined the best fit to be retrofitted. The surface wetland will collect the onsite wastewater and use a vegetative filtration system before entering the Jordan River.

As a result, a storm-water system would need to be added within the site. After further calculation, an 18-acre-foot system would be necessary for the average storm event. For the 100-year storm event, a 36.4-acre-foot system is needed. A stormwater, vegetative filtration system was determined best to be located running throughout the site and along the streets to allow for minimum invasiveness and maximum filtration. After the water is filtered throughout the system, it will be tested and if determined adequate will be used for hydrating the permaculture gardens.

The gardens will have various types of irrigation. Center pivot irrigation will be used for the produce that requires high amounts of water. Sprinkler system within the clear-solar greenhouses for the year-round necessary produce. An underground irrigation system for the rest of the gardens to ensure low evaporation rates. Finally, on west and south slopes, a vineyard style planting will be incorporated for maximum sun impact.

By adding a three-mile permaculture interpretive trail, the residents have a multi-use trail system throughout the gardens and connecting to the park systems. The trail would connect at various locations to the Jordan River Trail System, allowing visitors to learn about permaculture practices as well.

The park system within the development allows for various types of activities. From open lawn space to sport courts to children jungle gyms, all residents on the site have an outdoor space for their choice of use. There is a neighborhood park programmed within a quarter mile or 5-minute walk from every residential unit. Cottonwood Junction is the large community park of 11 acres and is centrally located in the development and adjacent to the commercial district.



Salt Plaza and Bingham Pavilion

Wasatch Children's Water Park