



ELEMENTS OF THE IN-HARMONY SYSTEM ©

Introduction

The In-Harmony System is both a process and a philosophy. By taking a holistic approach to life and integrating a harmonious inter-species attitude we look to collaborate with all life forms, rather than compete and eliminate.

With increased knowledge and awareness of nature it is time to re-organize the structure that will embrace compatible relationship. Our new understanding of ecology and evolutionary biology is teaching us that we cannot survive by destroying most of the life forms below us.

In-Harmony creates a new built-environment that re-organizes human activity in such a way that it balances with Nature, creating whole-system sustainability

Background

The problem is that we have developed bad habits during the last 6,000 years that must be completely altered within the next 50 years. Our past and present civilizations have produced non-degradable by-products or pollutants in the air, water and in the soil.

At first these were just simple pollutants, but in the last 200 years, assisted by carbon-powered machines and complex chemical by-products; we are causing accelerated environmental degradation. We have increasingly used sophisticated chemicals with little awareness for damage to our own health and that of other life.

We have caused the Earth's environmental window of survivability to rapidly destabilize causing Climate Change anomalies. Now we must rapidly adapt to a new lifestyle or face extinction like so many other species in the past that altered their immediate environment.

Recognizing that our two greatest threats are Population and Consumption, we must quickly transform our lifestyle to return to a more natural balance. Sharing the Earth needs to be our top priority. We are eliminating millions of different species to recreate this world into an artificial realm of just billions of top-down predators with only a few supporting players. Human domination of the Earth surface must cease and start contracting to allow other species the space and opportunity to thrive.

We see the following corrective measures as necessary for successful remediation:

- The System must allow for stabilization of organic food production, water collection and distribution, zero carbon emission, zero solid waste build-up, efficient utilization of space and protection from intruders.
- We must change our transportation away from inefficient, carbon-based energy to a system that allows for pedestrian intra-city movement and non-polluting inter-city mass transit.
- We need to transform industrial and construction activities to recycle existing materials rather than extracting new.

- Our cities are not strong enough to withstand major environmental turmoil, much less basic infra-structure deterioration and maintenance that are becoming increasingly burdensome.
- In addition, major flooding is becoming more commonplace so barrier systems must be in place.

With these requirements in mind, we have created the In-Harmony System to provide all the requirements that make a self-sufficient, ecologically balanced and energy efficient city.

ARC City Dwelling Structure

A major solution to transforming our civilization is to change our concept of dwelling.

- The building is a mega-structure, first created by Paolo Solari. We replace small one and two story buildings, connected by roads; with compact, modular mega-structures cities, so that human presence will be contracted. In this way the land that is normally buried under roads and buildings can be used for growing plants in parks and for food production. In addition, these high-density cities allow people to move about on foot or with efficient elevators. With commuting eliminated, people won't have to deal with inclement weather.
- The building can easily evolve. The structure is made of concrete with floors above and below grade. The floors and our walls are considered permanent for hundreds of years, while the interior walls are considered temporary and can be moved and altered to fit the requirements of the current occupants.
- The building is highly insular to external temperature variations. As a mega-structure building, it maximizes inner volume to outer surface, which greatly reduces heat transfer. The exterior walls may be cast with up to 10" thick to prevent gamma rays from penetrating. Being made of concrete it has great thermal mass. Wall insulation for heat transfer can be totally inhibited with aerogel or other mega-insulators. It maintains subterranean embedment (geo-exchange heat pumps) which stabilizes the building temperature.
- The building is designed to utilize natural cooling and air flow. Cold air is stored at the lowest subterranean level and moved by super large fans that create air movement. Depending on exterior air levels the ventilated air can be exhausted, with filtered fresh air brought in. If outside air is undesirable then the air can be recycled and even run through the greenhouses to allow for oxygenation.
- The building is designed to monitor air quality and make adjustments for oxygen levels, CO2, microbial pathogens, Legionnaire's Virus. The building has the capability of hermetically sealing should outside air become toxic. Daily life (live, work, play) will continue inside with atmospheric purification systems should this action be necessary.
- The building is designed for Resilience. It has cold room food storage in the basement next to food processing. Water storage is located next to the food storage in subterranean areas. Lastly, energy generation is stored outside and underground near the building. Each of these commodities has a minimum 4 months supply for the entire City.
- The building is strong enough to resist the harshest of Earth's anomalies. The round structure is designed for aerodynamics and seismic resistance. With environmental destabilization we could be facing 10.0 earthquakes and 500 mph windstorms.
- The building is designed for material flow of incoming supplies and outgoing products for trade. These activities occur at our underground warehouses and subway freight terminal adjacent to the City structure.

Sports and Recreation

All plants in these areas will have permanent bed, permanent planting so that the soil environment will be undisturbed and all plants to flourish with the assistance of soil inoculums and also earthworms. Mulch will be applied periodically to increase organic content. There will be no use of synthetic fertilizers, herbicides or pesticides. No water will be introduced from sub-surface aquifers, which may contains salts or dissolved minerals.

- Children's Playground and Petting Zoo
- Sports Center- Tennis, Basketball, Baseball, Track, Football & Soccer
- Outdoor Amphitheater – 20,000 seat center for concerts, plays & gathering
- Swimming Centers – Olympic Pool & Diving
- Bicycle, Skateboard & Skating Equipment Center
- 18 km of paved pathway for jogging, cycling & skating
- Picnic areas for family gathering with takeout food baskets available

Water System

Water is in continuous flow on the Earth. Some places have little and receiving less each year. Other places are getting more as Climate Change is altering weather patterns. The System is initiated with rainwater runoff from the 1,300 acres of greenhouse roofs. It is run through drainage pipe into the ARC City, where it is filtered and stored both underground and in elevated tank upstairs in building. By using a creating an intricate water system, drinking water is re-used as wash water in sinks and showers. It then flows to toilets where it is used to mix with yellow water or brown water. Once used in food production water is allowed to percolate down into the water table. Excess water, not needed in storage can directly injected into the ground water table.

Energy System

Energy is a key element to any modern society. Since the advent of modern electrical systems our entire building and city infrastructure is tied to electricity. How and where the electricity is generated is the key. Due to ever increasing amounts of CO2 being released in air due to coal-electrical generation, car & truck exhaust emissions and industrial use it is most desirable to generate "clean" electricity from renewables, natural gas, hydroelectric or nuclear. Each one of these power systems has drawbacks, until the very near future.

The energy of the future is Liquid Fluoride Thorium Reactor (LFTR) that utilizes a molten salt for heat transfer. This system had successful prototype testing for 5 years at Oak Ridge National Laboratory until shut down for political reasons in 1974. That technology is now being redeveloped in India, China, Japan and the US. The Thorium material is readily available worldwide, requires much simpler power stations and utilizes 99% of the base material so there is virtually no waste to deal with.

Energy is generated at each City with 1 weeks supply stored for emergencies in the form of hydrogen fuel in giant underground compression tanks or in the form of molten salt heat in giant insulated storage tanks built underground. This form of energy power is plentiful for 200 years and can be safely sent to other cities in a reverse Supra-Grid in case of a power outage somewhere else. With energy storage systems working as a buffer, daily peak demands can be drawn off from storage and replenished during off-peak hours. This will eliminate the entire "Smart Grid System" which is a very complicated mechanism used to solve a problem created within an old, failing system of long distance power supply.

Security System

Security is another key element to the success of our futuristic city. Climate Change will affect many aspects of life including food availability and flooding. With food and water shortages developing, the traditional cities will become chaotic. Law and order will dissipate so that rule of force becomes law. We maintain order within the In-Harmony System by creating a large Perimeter Wall around the property that prevents infiltration by marauders. Entrance into the City occurs at the train stations, above and below ground. There security squads will screen all entrants for weapons, contraband and communicable disease. The Perimeter Wall will also prevent flood waters from entering our fields.

Waste Recycling System

Waste is defined as both an item of no value, no further use or to squander extravagantly when there is still worth available. Tradition cities have a single pipe for effluent, possibly a second pipe system for storm drain rainwater disposal and a separate system for solid waste. All three of these systems fail to balance ecological needs.

A mega-structure city in one building can afford to create a multi-pipe drain system to route various types of waste into selective output processing systems. The systems include grey-water, yellow-water, brown-water, chopped organic waste from kitchens, concentrated laundry cleaners from the community laundry machines, and various types of industrial wastes that will need to have special processing.

Each type of waste listed above has an optimum organic solution. Grey-water can be directly applied to plants, provided the soaps used are all bio-degradable. That is controllable in the ARC City. Yellow-water needs to be purified with UV germicide lamps to kill any bacteria, virus or fungus in the urine. It can be applied directly to plants with drip irrigation. Brown-water and industrial waste can be neutralized organically through several types of hydroponics filtering that various carbon, nitrogen, phosphorous, potassium, as well as minor and micro nutrients reclaimed and applied as a mulch onto all the food production units.

Food Production

Food will be generated in many areas of the site. In all areas it will have permanent beds to stabilize soils and use organic, bio-dynamic techniques to heal the soil.

- **Greenhouses** – these may be insulated and heated as necessary depending on the location. The greenhouses will be built onto a concrete slab with drainage slots. There will be a water heated radiator system establish above the slab and cover with 12” of soil in permanent be. Greenhouses will have multiple roofs with common gutters to collect water. There will be an integrated downspout system off the gutters that goes under the slab into a master collection system. The greenhouses will have drip irrigation feed of water and nutrients. This will allow growth of plants in high density conditions for 365 days/ year. The greenhouses will be surrounded by canals on inside ring and the outside as well as 8 radiating spokes. These act to isolate soil borne disease into separate segments.
- **Field Crops** – This is the largest area of food production is our outside field crops. We will maintain permanent bed structure by drilling seed into place. We will develop a new farming system based on creating a mosaic pattern of plants that prevents typical mono-problems for insects and disease. We will also develop new electric powered farm implements that work in the smaller locations of a mosaic patterned fields.
- **Orchard Crops** – Tree crops, vineyards and berries represent fruit which is essential to the health of our citizens. Healthy soil and proper additions of nutrients will yield an important food source for our diet. Plants will be hand trimmed and maintained with netting if necessary. Trees will be interspersed in varieties to interrupt mono-cropping problems from insects and disease.

- **Fish Farms** – There are 18 lakes within the parks. We will grow fish as a balance of the micro-biome. They can be retrieved with fishing techniques by permitted individuals who meet withdrawal requirements.
- **Algae Farms** – Algae is a very important plant to cultivate. It can produce bio-fuel and more importantly it is a source of protein as a food supplement.
- **Tunnels for Food Transport** – We have a sub-surface food supply system to bring harvested food into the bowels of the City. There are eight radiating canals originating at the City and moving outward to the Perimeter Wall. Below the canals are concrete tunnels that contain two tracks and a walkway. Intermittently along the tunnel there entry stations for to exit and enter the tunnels. There are also chutes to load harvested food down to awaiting train cars for transport to the City food receiving docks. In addition to food production activities, the tunnels will transport people to the outer recreation areas, workers to the waste processing area and security personnel to the Perimeter Wall for defensive action.

LAND USE ANALYSIS

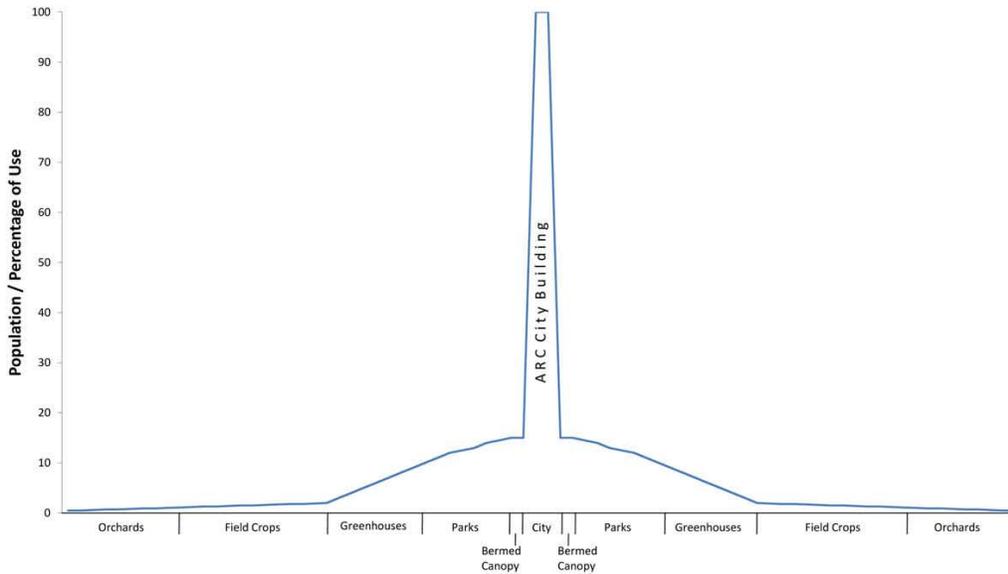
Total In-Harmony Site	= 12 square miles = 7,680 acres = 100%
Direct human habitation (ARC City)	= 24 acres = 0.3%
Recreation (permanent bed, great human activity)	= 76 acres = 0.9%
Parks, gardens, and lakes (permanent bed, no change)	= 375 acres = 4.8%
Greenhouses (permanent bed, constant replanting)	1,280 acres = 16.7%
Field Crops (permanent bed, annual replanting)	2,950 acres = 53.2%
Tree Crops & Vineyards	1,592 acres = 20.7%
Waste Purification Zone	263 acres = 3.4%

PROFILE OF HUMAN ACTIVITY

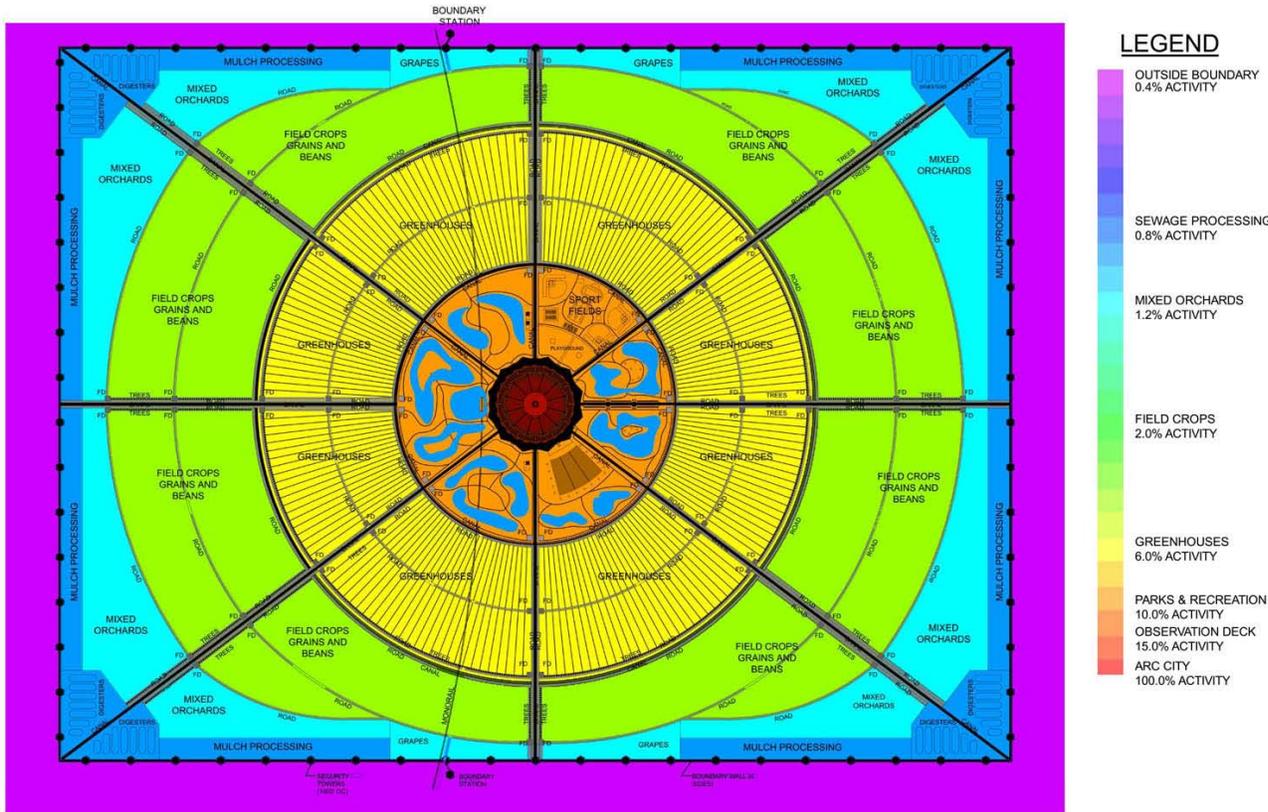
The following page shows both the size of the In-Harmony Site (4 miles x 3 miles) and the extent to which there will human presence. Within the City (building) there will be 100% of the population there most of the time. The Recreation Area (sports) will have as many as 1,200 people spread over 16 hours of activity. The Parks will have 1,500 people spread over 16 hours of activity in a much larger area. Food Production areas will have people shifting from one zone to another as the work requires. Their populations will vary, but maximum numbers are shown here. The Greenhouses will have 1,400 people working over 18 hours time. The Field Crops will have 1,600 people working 10 hours time. The Orchard Crops will have 1,000 working 10 hours. The Mulch/Recycling Area will have maybe 300 people in all four corners.

These numbers represent human presence instead of pristine wilderness.

Profile of Human Activity of the In-Harmony Site



Overall ARC City Site Function



HUMAN ENVIRONMENTAL INTERACTIONS BY ZONES

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