

# **SOMETHING NEW UNDER THE SUN**

**Physiosocial landscape interventions for the Holy Child Program,  
a school for children with behavioral difficulties in Beit Sahour, Palestine**

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A thesis submitted in partial fulfillment of the requirements for the degrees of

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# ABSTRACT

## SOMETHING NEW UNDER THE SUN

Physiosocial landscape interventions for the Holy Child Program, a school for children with behavioral difficulties in Beit Sahour, Palestine

VeraEve Giampietro

Chair of the Supervisory Committee:  
Associate Professor Lynne C. Manzo, PhD  
Landscape Architecture

As we work to improve life for everyone on this earth, it is important to identify circumstances where societal ills reseed themselves. I am curious about finding ways to address destructive cyclical behavior, to productively interrupt those cycles, and to divert destructive energies toward actions that are life-giving, healthful, and peaceful. My studies in Landscape Architecture and Urban Planning have shown that our surroundings can powerfully influence our behavior, and so through this thesis I seek to bring about healthful behavioral change through interventions in the built environment.

The site where I propose these environmental interventions is The Holy Child Program, a school in the West Bank, Palestine. It is a program that is aimed at educating young people while it addresses emotional and behavioral difficulties brought on by trauma and congenital disability.

The challenges to this work are great. Resources are very scarce. The cultural environment is tense and there is violence within the West Bank and all around – in Syria, Gaza, and Israel. Palestinians are ever more disconnected from their land, and the land itself is in a state of severe degradation.

With these challenges in mind, I propose a site design and implementation strategy that is holistic in a way that suits the gravity of life in this region. The framework is Permaculture, and it focuses efforts on collaboration with the land, pairing human ingenuity with existing resources to draw abundance from the land where it might otherwise be thought not to exist. My assertion is that active engagement with natural processes will help bring healing, respite, and delight to the Holy Child Program community, through the act of observing and working with natural cycles as they model healthful behavior.

This healthful interaction will help interrupt unhealthful cycles as they now occur onsite, replacing them with healthful cycles that mimic those observed in the landscape. Holy Child Program children, staff, and families will be renewed by long-term interaction with the land and the abundance of life-giving resources available there. The anticipated result is a site that is healing, educational, playful, and productive. This model of intervention is intended to be replicated across the region, to serve as an agent of change, to bring about both environmental and psychological health.



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I owe you one.



# DEDICATION

To all children and the adults who care for them:

May you be at peace; may your heart remain open;  
May you awaken to the light of your own true nature;  
May you be healed; may you be a source of healing for all  
beings.

\_\_\_Buddhist Metta Meditation



BEIT SAHOUR, PALESTINE

A photograph of a sunset over a cityscape. The sky is a mix of blue, orange, and pink, with wispy clouds. The city below is mostly in silhouette, with a few lights visible. The title text is overlaid on the right side of the image.

# SOMETHING NEW UNDER THE SUN

Physiosocial landscape interventions for the Holy Child Program, a school for children with behavioral difficulties in Beit Sahour, Palestine

“What has been will be again,  
what has been done will be done again;  
there is nothing new under the sun.”

(Ecclesiastes 1:9)



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humansofny

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humansofny "When you are a child, and you walk outside, and see that your neighbors house is gone, it puts something in you deep down. All the small children have fear. It's always with us. Weddings, graduation parties, these are happy events. But something is always missing. We always feel it. Life is very complicated now. There are checkpoints and police harassment. We live like second-class citizens. The Arabs are afraid of the Israelis. The Israelis are afraid of the Arabs. Arab children are afraid of bombs. Israeli children are afraid of rockets. And it's not like one side can win. The Israelis can never kill all the Palestinians. The Palestinians cannot kill all the Israelis. Only peace can end it. I'd say eighty percent want peace. The rest are crazy religious." (Jerusalem)

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# PRELUDE

Summer 2014 brings news of escalated tension and resulting military activity between Israel and the Palestinian territory of Gaza. At least 1,400 civilian Palestinians have lost their lives as Israel strikes targets across the 25-mile strip of land bordering the Sinai Peninsula on the Mediterranean Sea. Israel has suffered as well, with its own civilian deaths.

There is sadness but very little surprise for observers around the world. This conflict has raged through lifetimes and its intermittent eruptions seem to weigh little on the global conscience as this story sounds of an echo: Tit for tat. Tit for tat.

“What has been will be again,  
what has been done will be done again;  
there is nothing new under the sun.”

\_\_\_\_Ecclesiastes 1:9

I hear this for the first time on my second visit to Israel, in September 2013. My host and I were discussing the conflict between Israel and Palestine, and some of its particularities of the moment, and in an attempt to provide me perspective on the situation, she says this:

“Vera, darling, there is nothing new under the sun. This conflict has gone on since biblical times, and may very well continue forever.”

### **Patterns Repeating**

As we work to improve life for everyone on this earth, it is important to identify circumstances where societal ills reseed themselves. There is a great amount of evidence to support the idea that in the case of Israel, there is a profound degree of transgenerational trauma suffered by Israelis and the Jewish people. Many speculate that the Israeli-Palestinian conflict was borne of that trauma, and that the oppressed has become the oppressor. These types of cycles are common throughout all walks of life – the abused becomes the abuser, and carries the trauma forward to a new generation.

Breaking these cycles of oppression, abuse, and trauma is fundamental to improving quality of life, and even more critically, to human survival.

Without intervention, we repeat the same mistakes. The intervention could be the arrival of our own awareness, or the words of a friend, or some tragic event. Even then, the intervention may not create the desired outcome, of change in a more healthful direction. Sometimes we head further down the same destructive path.

The cyclical nature of the Israel-Palestine conflict is analogous to the repetitive and environmentally disruptive behaviors of many ordinary individuals around the world, actions that are wreaking havoc on our ecosystems. By damaging natural systems, these collective actions damage livelihoods, health, and prospects for a thriving future.

I am curious about finding ways to address destructive cyclical behavior, to productively interrupt those cycles, and to divert destructive energies toward actions that are life-giving, healthful, and peaceful.

This curiosity is what motivates me forward in addressing the site I have chosen for this design thesis, and what encourages me to internalize these lessons, so that I may choose life-giving, healthful, and peaceful actions, and so that I may work to design environments that encourage others to do the same.

With an artist’s sensibility, I do despair. I despair at the conditions of so many people suffering so greatly all over the world. But persistent and inactive despair does me no good, and only sours my experience of life. Key moments of despair are catalytic, strategically reawakening me to the hardship and suffering of others. But then I need to make use of that despair, and employ it in creating work that becomes an antidote to hardship and suffering. This is what I attempt to do through this thesis, to be collaborative with a community in need, to help bring about a scenario where together we ameliorate hardship through shared purpose and enjoyment of the beauty, wonder, and abundance that the natural world so readily provides.

“We all fear death and question our place in the universe. The artist’s job is not to succumb to despair, but to find an antidote for the emptiness of existence.”

\_\_\_\_Midnight in Paris

### The Antidote

I have asked people who live in both Israel and Palestine what they think is the solution, the antidote to this particular conflict, what they think will interrupt cycles of trauma and despair. One, an American, and a Christian, says that she relies only on the love of Jesus Christ.

Another, a clinical social worker working in the West Bank, points toward a cultural shift of healing the psyche. She believes that trauma therapy and behavior modification can change cultures and their patterns from the inside. It was she who first keyed me into the idea that in this region, the oppressed had become the oppressor, and that such a constant oscillation of poles was unfolding continuously across time and space.

A culture devastatingly traumatized during World War II had become an occupying, oppressive force. And within Palestine, an occupied, oppressed population had shown evidence of doing the same, with sharp, bitter instances of intra-clan violence. Anecdotally, this is also happening at the household scale, where families are reporting increases in corporal punishment and domestic violence.<sup>1</sup>

This is where my friend the social worker focuses her efforts: in the household, family, and community. She is implementing a behavior modification curriculum at the Holy Child Program, a small school in Beit Sahour, Palestine, aimed at educating and treating children with behavioral difficulties living in the West Bank. This program aims to replace harmful, hurtful action with positive, loving action. She believes that such behavioral replacement methods will intervene and break unhealthful cycles, and replace them with healthful, life-giving cycles. She knows that this work is grounded in research, as its methods have been developed through evidence-based studies.

This approach is well known by teachers. Instead of simply telling a child not to do something, the teacher requests that the child engage in an acceptable behavior in its place. This allows the child to make engaged choices with tangible outcomes, rather than sit in passive obedience.

I am aiming to do the same, to replace environmentally destructive cycles with regenerative ones, and at the same time cultivate positive interaction between people as they engage a flourishing environment around them. With nature as our guide, we can work toward replacing unhealthful behaviors with healthful ones.

There is, however, one perspective that tempers this optimism, that deadens these cheers for life-giving green exuberance; it is the voice of a Palestinian. He is a member of the local community and we have been discussing his thoughts on the Israel-Palestine conflict over the years.

It turns out that he is less concerned with this conflict than he is with the Christian-Muslim divide in the West Bank. From experience, he asserts that the Israel-Palestine conflict actually maintains a tenuous security for him and his Christian community that would otherwise face persecution.

1 Zabaneh 2012



BANKSY'S 'FLOWER CHUCKER' IN BETHLEHEM

During weekly sermons, delivered over loudspeakers that reach entire towns, Muslim leaders call for violence against Christians, including Palestinians. These perspectives are certainly extreme, and primarily represent fundamentalist rhetoric, not the values of the majority of Beit Sahour's residents. The fact that we can hear the calls for violence but then see little of it carried out is testament to this. But it is unsettling nonetheless.

My friend fears that a two-state solution could result in an extremist, Islamist Palestinian government that would show little mercy to the dwindling Christian population in Beit Sahour. In fact, an ISIS flag was recently planted in a town near the Holy Child Program, and this extremist group is known to target Christians.

To think that the Israel-Palestinian conflict actually guarantees the Christian Palestinian community some semblance of safety is an alarming notion, and speaks to the tremendous and unspoken trauma of so many people in this region. There is stability - tenuous and fundamentally unbalanced - that keeps a fragile peace for some subsets of the larger Palestinian population. Knowing this reinforces my approach, to seek healing on

the small scale, from the inside out, rather than from a hierarchical position where populations are generalized and broad sweeping solutions result in hidden casualties.

War, conflict, occupation, violence, home demolitions, rockets, suicide bombs, checkpoints, armed soldiers, environmental degradation, flooding, droughts, hunger, unemployment, and poverty; all of these figures and their movement across the landscape traumatize everyone involved. The work that needs doing here – and for mental health everywhere – is tremendous. It is staggering, and crushing at times.

My assertion is that emotional and psychological healing are paramount to bringing peace to people on earth, and that nature so readily provides healing and models healthful cycles of behavior.

There is nothing new under the sun. For what we need to sustain and heal us, there is no new wisdom, no technique undiscovered. There is however, newness available in the way that we interact with one another. There is hope in healthful relationships that have yet to be.



HOLY CHILD PROGRAM ENTRY GATE

“When you hold yourself in warmth and gentleness, you go a long way toward helping your relational habits transform.”<sup>1</sup>

---

1 Taylor & Goldfield 2014

# INTRODUCTION

This thesis proposes a site design and incremental implementation strategy for a therapeutic, educational, and productive landscape at a school in the town of Beit Sahour in the West Bank, Palestine. The school is called the Holy Child Program (HCP, “the Program”), and it is a small educational day program that specializes in caring for children with behavioral difficulties. Much like the Palestinian population on the whole, many students and families involved with the HCP have experienced direct and intergenerational trauma from the Palestinian intifadas, loss of land and livelihood through the Israeli occupation, and social and psychological hardship as

# INGREDIENTS

- an eager community of people
- a slice of land
- a communal work tradition
- consistent collaboration with the land, its natural processes, and its resources, all of which it so readily provides

Table 1. Abstracted process

a result of living within an economically depressed and forcedly dependent society. This thesis works to address these hardships by deploying a series of site interventions, designed to work together to aid the healing processes already underway at the Holy Child Program and to build livelihood and long-term self-sufficiency into its operations.

The proposals put forth in this project are aimed at making best use of existing assets (Ingredients), bringing them into a state of best use through introduction of catalysts, so that we may achieve desired outcomes of healing, education, and ultimately emotional and physical resilience [Table 1].

This is both a design and implementation plan. This work will ultimately result in a site-specific but replicable model for communities seeking to develop productive, therapeutic sites as well as sustainable livelihoods through renewable resource stewardship.

The challenges to this work are great. Resources are very scarce. The cultural environment is tense and there is violence all around – in Syria, Gaza, and Israel.

# CATALYSTS

- enhanced contact with nature
- technologies appropriate for making use of nature's ever-present abundance, but which do not hinder its health or functionality
- an educational and play curriculum that invites teachers, parents, and children into the landscape
- marvelous wonders placed in the landscape to keep everyone engaged and eager to come back

Palestinians are ever more disconnected from their land, and the land itself is in a state of severe degradation.

Exacerbating these hardships are steadily expanding urbanization and patterns of consumption, which together devour the bounty of readily available resources once so prevalent on the land. Landscapes that used to be fundamental sources of livelihood, culture, and pride are now degraded beyond recognition. The Fertile Crescent has transformed into a dry bed of sand.<sup>12</sup>

This state of the environment is not for lack of trying - Palestinian efforts to employ historic methods of sustainable water harvest, for example, are regularly undermined by Israeli intervention. Stories abound of Israeli soldiers cruising the West Bank and shooting holes in rainwater catchment tanks, declaring them illegal, rendering them useless.<sup>3</sup> Challenges of urbanization and resource scarcity are further sharpened by a forcedly dependent Palestinian territory. For example, Israel controls over 30% of the

1 ARIJ 2007

2 National Geographic 2001

3 Chehata 2009

# OUTCOMES

- healing
- outdoor education
- interactive and imaginative play
- sustainable food and fiber production
- economic self-sufficiency
- resilience
- the emergence of this site as a beacon of hope for communities throughout the region

Palestinian territory, and with that power extracts water from aquifers beneath Palestinian land. Israel places very strict limits on Palestinian access to these aquifers, and restricts Palestinians from digging new wells, while it allows Israeli settlers to extract water without limit.<sup>4</sup> In this and similar ways the Palestinian territories are forced to rely more and more on imports from Israel and its trading partners - and they are restricted from exporting their own goods.

Underlying all of these environmental and social difficulties is profound cultural and social trauma on both sides of the conflict. There are shared traumas from violence directly experienced during the first and second intifadas. And the conflict is not isolated to those two events - hundreds of Palestinians and many Israelis have lost their lives before and since. Both suffer the consequences of violent flare-ups. Palestinians regularly endure prolonged and continued loss of livelihood, degradation and confiscation of their land, and destruction of their homes.<sup>5</sup> Israelis live in fear of suicide bombers and rockets falling into their neighborhoods.

4 CEPR 2012

5 Lynfield 2013

So much trauma is reseeding itself so regularly on both sides of the wall between Israel and Palestine. As a result, across both Israel and Palestine there is a palpable desire for a better life - for health and safety for the people, for the land, and for social and cultural relationships. If any of the unhealthful patterns are going to change, if the West Bank and Israel are to find peaceful coexistence, I believe that it will rely on healthful treatment of emotional, mental, and psychological ills, on both sides of the wall.

Fortunately for all of us, there are prospects for overcoming these challenges. There exists a broad base of modern mental health practices aimed at treating victims of trauma. These techniques are desperately needed throughout Israel, Palestine, and much of the conflict-ridden Middle East. At the Holy Child Program, there are passionate teachers and therapists providing these very kinds of therapies. But they need support. Through this thesis I propose that the Holy Child Program include the landscape as another agent of healing. I assert that collaboration with the land can yield goods and resources and that the process of growing and harvesting these elements is, in itself, a healing act.

Through a technique that pairs ancient agricultural wisdom with the ingenuity of modern technology, we can address many of the challenges faced onsite in Beit Sahour, at the Holy Child Program. This technique offers emotional healing through invitations to commune with natural elements and processes. It offers social healing through opportunities for communal work and shared yield. It offers enhanced physical health through practice of organic urban agriculture, healthful livelihood through abundant yield and a resilient and replicable model, and ecological healing through restoration of the landscape and responsible stewardship of all of its resources.

The technique is Permaculture, a framework for designing resilient and highly productive systems. Here I propose applying the Permaculture model to the Holy Child Program site, so that the landscape yields more than it does today, in the form of education, healing, productivity, fun, food, reliability, and delight to everyone involved.

“Broadly, permaculture may be classified (insofar as such an holistic entity may be) as a branch of ecological design and ecological engineering which aims to develop sustainable human settlements and self-maintained agricultural systems modeled from natural ecosystems.”<sup>1</sup>

---

1 Rhodes 2012

### **Critical Stance: A Case for Functional Redundancy**

The intricacies of the Permaculture model will be discussed later in this document (see Design Approach), but its intrinsic genius is the assertion that functional redundancy be required for any system to be truly resilient. Without functional redundancy there is unnecessary vulnerability.

In Permaculture, functional redundancy refers to a system where there are multiple entities performing the same function. Each of these entities is different, and performs its function in a unique way.

A great example of this is energy production. Permaculturalists do not rely on a single source of energy for powering a site and its operations. Instead, they may incorporate solar panels, a wind turbine, and an electricity-generating wood stove, all on the same site. They do this because it helps the essential function - energy production - to be resilient to disturbances. If there is no wind on a given day, then there may be sun and burning wood to provide needed energy.

Figure 2. "Ancient Courses." Diverse river flows; historic paths of the Mississippi River

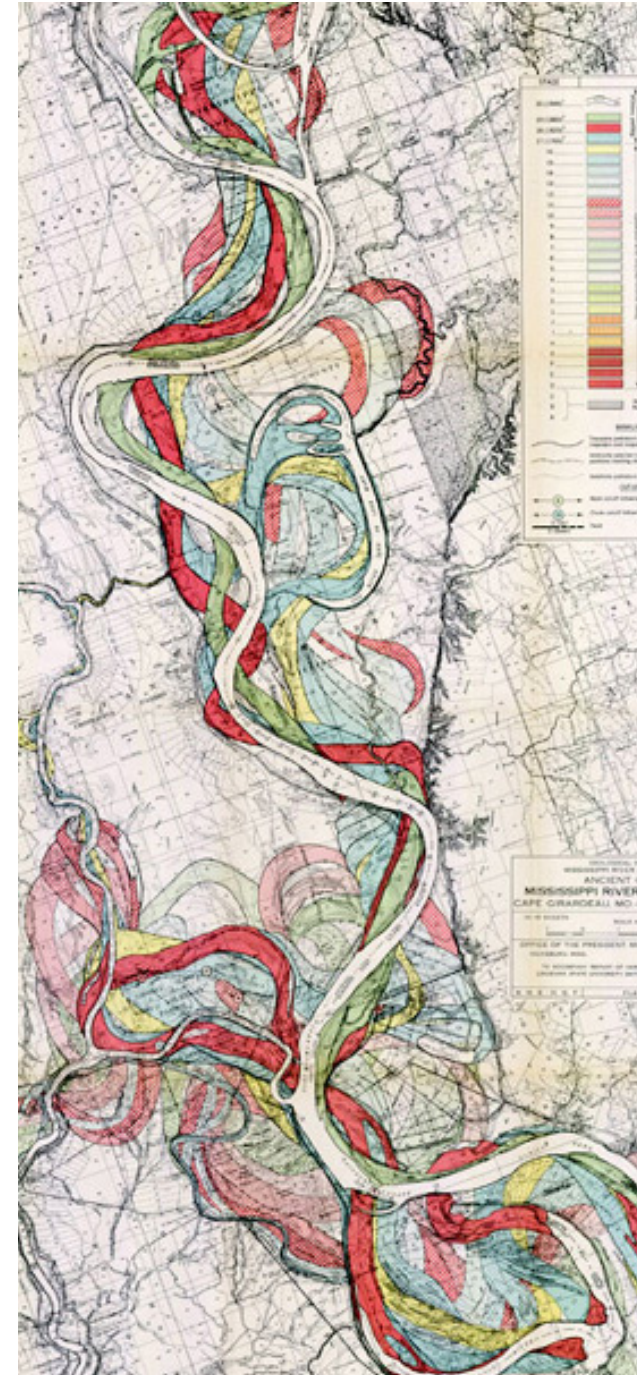
In contrast to this approach, modern conventional wisdom has called for us to address systemic problems with singularized solutions, to apply one answer to each situation in the name of economic efficiency and predictability.

We do this in conventional medicine, where we look only at the ailing part of the body and treat its symptoms, and ignore the system as a whole. We do this in agriculture, where we are narrowing to fewer and fewer species of vegetable, fruit, and grain. We do this in manufacturing, where entire towns in China specialize as producers of one industrial product. The modern architecture movement also promoted this ideal, claiming a mass-produced, context-devoid design solution as the savior of humanity.

The same is true in environmental engineering, where rivers and streams have been channelized so that their flow is now ostensibly predictable and follows one steady course. We are now understanding the consequences of abstracting functionality in this way, of singularizing system functions and expecting better outcomes. These new outcomes are proving to be less reliable and more damaging than ever.

The example of the river makes for an excellent image of just why our singular, abstracted solutions are failing us. The Mississippi river was once a free flowing force of water, which traced an ever-changing path across the landscape over the course of seasons and across centuries [Figure 2]. This only became problematic when large numbers of people started settling permanently in the river's floodplains, where the river's changing course allowed for too much variability. The land within its floodplains could not be developed in the way that settlers desired.

To address this "problem" and make the river's flow predictable and to prevent it from inconveniencing homes and livelihoods, engineers decided to channelize the river, to dredge its course and to pave its edges so that the flow could not escape a singular path [Figure 3]. This would allow us to develop in floodplains, to build alongside rivers, and to maximize the financial value of that land.



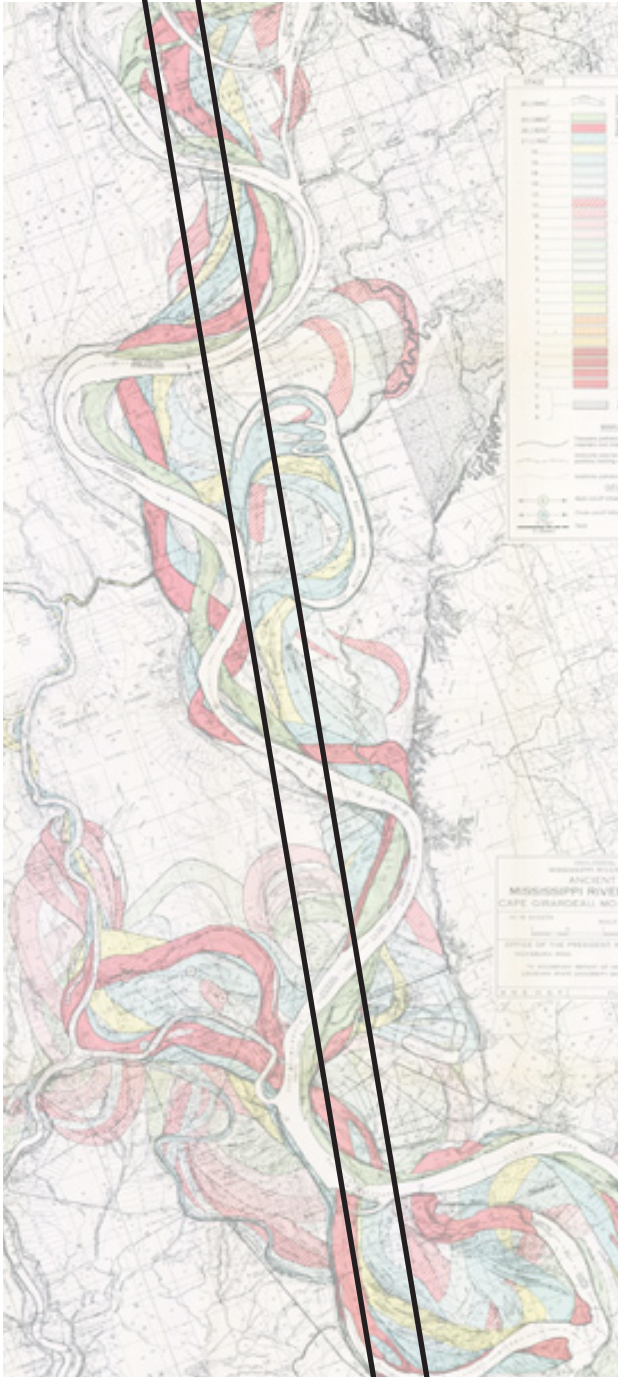


Figure 3. The river channelized

What was not considered were the impacts of this channelization downriver. It turns out that the historic meandering flow was serving multiple ecological functions that were not considered when the Mississippi's course was made singular. Prior to channelization the river demonstrated relatively slow and shallow movement, which provided thousands of miles of habitat along its banks. The river's long-cultivated relationship with its edges allowed vegetation and wildlife to thrive there.

But when its flow suddenly became channelized, the river began to move faster, and downstream of these channels it began carve away at its own edges with its newfound velocity. Edge habitat was carried away with the river's new force, effectively destroying historic dwelling places of abundant biodiversity.

Channelization has also caused changes to sediment deposition - in some places there is so much more that it overwhelms wildlife habitat, and in others there is not enough to continuously replenish the structure of the river floor.

There are many other negative impacts of channelizing the Mississippi River, including the rapid disappearance of the river delta along Louisiana's coastline and its resultant diminishing capacity to buffer hurricanes, as was the case with Hurricane Katrina.

What this seemingly tangential example serves to illustrate is that many of the monolithic solutions to "problems" of the natural world are proving to be too narrow in their scope of concern. Stifle a condition here and it will show up elsewhere in nature, and not often where we expect it. To be fair, it is only in recent history that we have been able to execute such extensive infrastructure and then watch the monumental consequences unfold. It is not a problem of ill will, but rather a steep collective learning curve when it comes to understanding the many manifestations of nature's force. Still, many contemporary strategies for resisting natural forces continue to focus on eliminating uncertainty by slashing diversity and functional redundancy, particularly where site design and engineering is concerned.

“Crop diversity decline ‘threatens food security.’ Fewer crop species are feeding the world than 50 years ago - raising concerns about the resilience of the global food system, a study has shown.”<sup>1</sup>

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1 BBC 2014

Permaculture looks to functional redundancy because it is abundant across nature. Natural and cultivated ecologies thrive on a diversity of elements that together serve an ecological system’s essential functions. There is not one kind of pollinator but thousands of species that do the job. There is not one kind of tree that provides habitat and soil stabilization, but rather thousands of species and varieties. Together, a diverse set of species with varied strengths and weaknesses allows a system to be resilient because one pest will not eradicate the entire ecosystem. A pest may decimate a single species of tree, but another species that has developed resilience to the pest will stand in their place and allow the system to carry on [Figure 4].

Variety is the spice of life, but it is also the stuff of strength and resilience. We should not just exercise a single muscle in our body, we should exercise many of them. This is because we know from experience that our bodies are asked to respond to a diversity of physical challenges - climbing stairs, sitting in chairs, lifting, crouching, running, and bending.

A site is asked to respond to an even greater variety of challenges. And so applying the concept of functional redundancy to site design, and analyzing a place with diversity in mind, it is clear that enhanced variety and functional redundancy would do well to foster resilience of place.

### **Resilience Through Functional Redundancy**

The Permaculture model is an ideal design approach for addressing needs at the Holy Child Program because the HCP site currently faces many of the challenges that Permaculture anticipated when it was devised. In the 1960s two Australian farmers found themselves very uncomfortable with the agricultural practices taking hold in their region. Bill Mollison and David Holmgren could see that plant species diversity was being stripped away in favor of a few highly productive crops. In turn the land was being stripped of its fertility, and control of the agricultural market was going into fewer and fewer hands.

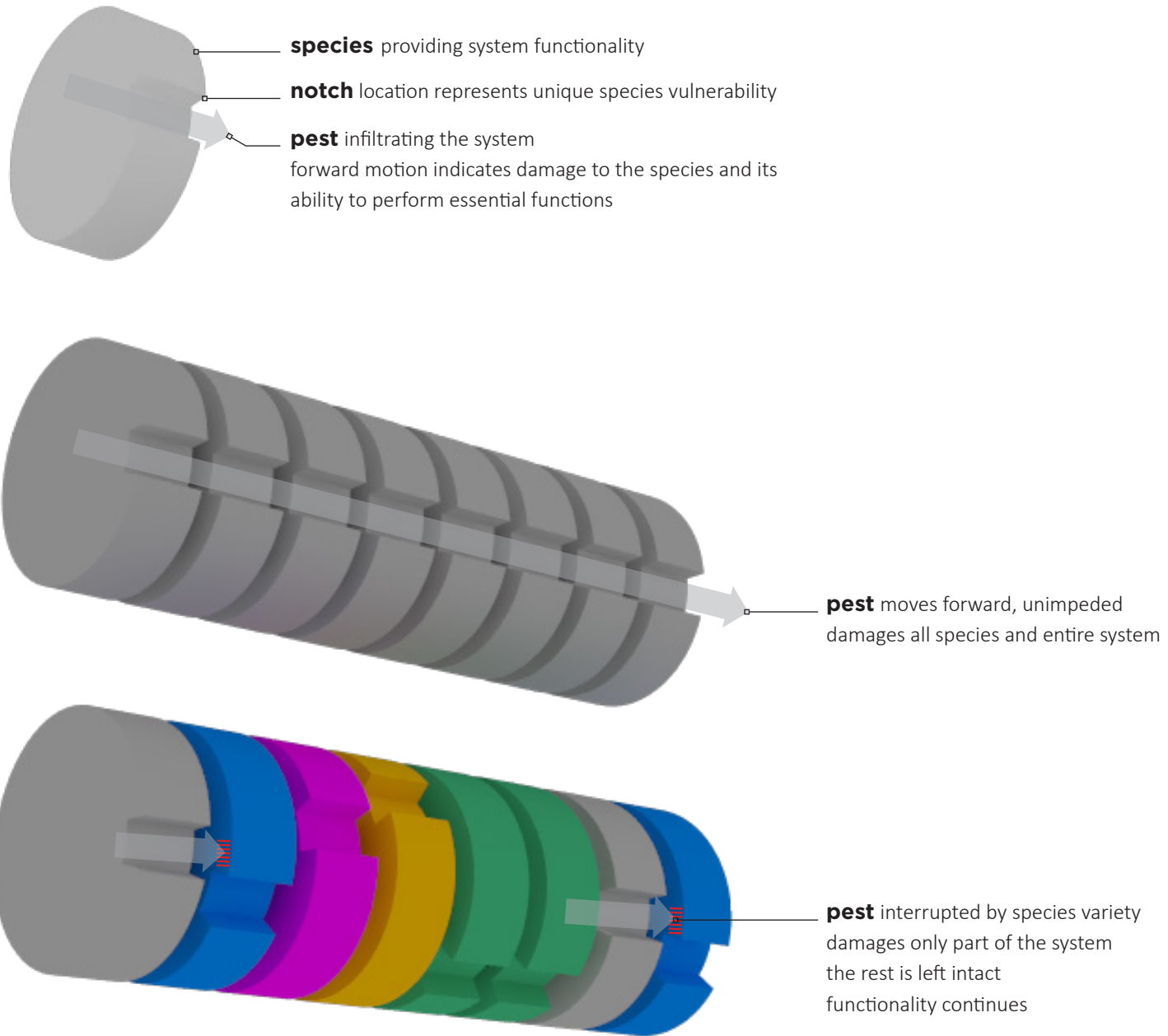
In response, Mollison and Holmgren devised a system based on millennia-old agricultural practices, and modified them to boost yield so as to make the system viable for entire societies. They called their system Permaculture.

Originally a contraction of the words “permanent” and “agriculture”, the concept quickly evolved to incorporate the social dimension, and now claims “culture” as a vital component of the system. Mollison and Holmgren quickly understood that permanent agriculture was not possible without being driven by the enduring efforts of human cultures.

I first learned about the deep wisdom of functional redundancy through my study of Permaculture. Contrary to what might otherwise unfold through a site design process, with single solutions to each programmatic need, Permaculture demands that each design problem be solved in a variety of ways, and that the solutions operate simultaneously alongside one another.

Such an approach to landscape design undermines modern understanding of what is efficient. Why pay to devise and install three water sources when one is all that we need right now? The answer, of course, is that we do not know what the future will bring, what challenges it will pose, and how future conditions may make our current, singular water source obsolete, rendering us waterless.

Figure 4. Functional Redundancy Diagram



**monoculture**  
system comprised of few or single species

**polyculture**  
system comprised of many species performing similar functions

A tough pill to swallow for many who finance design projects, functional redundancy is among the best strategies for ensuring that a site is resilient over the long term. In that way, Permaculture also demands a long-term vision for site design. Contemporary western approaches to commercial site development are generally ill-suited to the Permaculture model, as this kind of site development tends only to concern itself with near-term outcomes.

Resource constrained and unstable as this site is, the Holy Child Program does not have prospects for financially-driven redevelopment. Instead it faces real threats to existence: threats to water and food security, threats to livelihood, and as a result, threats to human safety. Mollison and Holmgren's fears have come to life for Palestinians and Israelis alike, as well as many others around the world who live in water and food insecure places. Such extreme circumstances call for a holistic solution, and Permaculture offers just that.

Another way in which the HCP site and the Permaculture system are a good fit is that Permaculture demands that its participants commune with the natural forces around

them; there is no way around it. The assumptions put forth by this thesis, and by the Permaculture model in general, are that natural processes are self-renewing, that once initiated, they tend to carry on indefinitely. The earth turns, sun shines on green leaves, plants grow. The moon moves the tides, wind moves within bays and across continents and around the globe. Natural processes are reliable. In a place where the font of any resource can be turned off without notice, the natural world offers a bottomless well of reliability. Specific manifestations of natural processes may vary in their reliability - rain may be less frequent today than it was two hundred years ago - but there are so many other processes still in play that can be identified and relied upon for consistency, structure, and inspiration.

This is important because this project aims to provide healing through site and system design, and where teachers provide healing in the classroom, I aim to extend that healing outdoors, where students will find healing in the landscape. We want the site and the natural forces and elements observable there to teach students about nature's life force, and by extrapolation, the essential forces of life on earth.

We also want the site to model healthful, reliable, life-giving behavior. Modeling healthful behavior is at the heart of the cultural change currently underway at the HCP, and so this project calls on the landscape to model its inherent properties of health and regeneration.

Providing instruction and behavior modeling are wonderful endeavors in their own right, but we also want to encourage them to endure for decades and centuries to come. Permaculture's collaboration with natural systems offers us the opportunity to hop on the perpetual motion machine that is the natural world, where our efforts help bring about consistently renewable yields that meet our long-term social, physical, and spiritual needs. Setting up a system that makes use of the inherent renew-ability of natural processes – while ensuring that the design intervention does not interrupt the functionality of those processes – will naturally lead to system yields that are themselves continuously renewable for many years to come.

Designing for permanence offers a vision of the future where resources are continuously dependable, livelihood is not difficult to come by, and nutritional, emotional, and

cultural needs are met without interruption. It may be ambitious for this small site to achieve such a future on its own, but if it can act as a beacon and an alternative to the singularized, industrialized trajectory of most modern economies, the site and its system of renewable resource generation can be replicated across the West Bank and beyond.

### **Why Palestine?**

I have been involved with the Holy Child Program since early 2007. My work focused primarily on raising funds for the program from the United States, but I have visited several times and kept in touch with the school director. I was originally drawn to the site because there is great need expressed by the people there. There are needs for resources as well as healing and justice. I was also inspired to work with this site because of the stories shared by a family friend, a Palestinian who spearheads the fundraising effort. He talked about his time helping out at the Holy Child Program, and how he found healing there in spite of the larger context of conflict and occupation.

In my home country of the United States, so many resources are artificially affordable to such a degree that the case for Permaculture design can be difficult to make. It is a holistic and labor-intensive type of intervention, and because current constraints are not clearly so dire as they are in other parts of the world, permaculture is seen as a fringe approach. Why work so hard to grow your own food and produce your own fuel if it is immediately and cheaply available down the street? At the Holy Child Program, the extreme degree of site and resource constraints demands this scale of site intervention. The Permaculture model is an intensive design approach that matches the gravity of life in the West Bank.

### **Back to the Land**

One of the fundamental barriers that this thesis seeks to overcome is increasingly widespread disconnection between modern societies and their land. In this case, we are looking to the Palestinian people, who enjoy a rich history of deep engagement with their land through agriculture and animal husbandry. That relationship is now in decline, and there is growing unfamiliarity between Palestinians and their agricultural heritage.<sup>6</sup>

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6 ARIJ 2010

Evidence of the Palestinian disconnect from agricultural practice can be found in steadily declining representation of agriculture in the Palestinian economy, sharp import increases in produce and food goods from Israel and other countries, and recent, widespread trends that aim to bring Palestinians “back to the land” – suggesting implicit agreement on a cultural distancing from agriculture and land engagement practices that were once so intrinsic to Palestinian society.<sup>7</sup> Were it not for this disconnect, it is conceivable that self-sustaining, resilient agricultural systems would already be widespread across the region.

Global trends toward industrialization have brought environmental degradation to this region – particularly desertification – which is of particular concern in arid and semi-arid countries of the world. Overcoming these hardships in Palestine, a place fraught with conflict, adversity, and harsh landscapes, gives promise for the prospect of addressing such hardships on a global scale.

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7 ARIJ 2007



GROWING FOOD ONSITE AT THE HOLY CHILD PROGRAM

“Having a dependent economy without sovereignty over resources and lacking appropriate development policies, especially for land and water management, has made Palestinians vulnerable to external economic and political shocks, without a local economy to cushion it.

This results in a complex situation of interdependency with strong negative effects on the Palestinian agricultural sector. A major reason for Palestinian economic dependence on Israel has been the lack of export market access for Palestinian goods and the Israeli restriction on the flow of goods from abroad.”<sup>1</sup>

### Phased Implementation

With such lofty goals this design will take time and care to properly implement. This thesis proposes a sequenced implementation plan, incrementally bringing sustainable livelihood to the HCP community while it systematically reconnects students, families, and teachers with the inherently healing, educational, and life-giving qualities of the land.

Phased implementation is entirely consistent with Permaculture principles. Among others, these principles call for small and slow solutions, observation and interaction with the site as it adjusts to interventions, and creative responses to change over time.

If I deliver a site design today, Permaculture tells me that it will need to be implemented slowly, in small pieces. Permaculture tells me that I will need to pay close attention to how this design impacts the people and the land on a daily basis. Permaculture tells me that I will need to adapt to unexpected outcomes and adjust the design accordingly.

For these reasons, the design I propose here is a starting place, it is a launch pad for urging my community into action, to begin implementing this vision. The design may seem tentative, or incomplete, and I do this deliberately.

As a landscape architect, urban planner, and person invested in improving the human condition, I am looking for ways to improve environmental and human health, all within a context of increasing resource scarcity. This project is valuable to my disciplines of Landscape Architecture and Urban Planning - and to me personally - because it presents an opportunity to demonstrate how resources immediately available on the land – natural processes, existing nutrients, and human agency – can work together to meet human needs without harming the environment.

This project also proposes a behavioral intervention model that has precedent in educational settings around the world, one that is based in evidence and that has implications for curtailing destructive behaviors of all kinds. Contemporary approaches to positively influencing human behavior include significant attention to design of the built environment. Research has shown that our surroundings can push us in the direction of morbidity,

but they can also push us toward health. Crafting spaces that model healthful behavior and insist that we do the same - these are the kinds of cities we are trying to build today. I am exploring this very kind of social engineering - promoting public health through environmental coercion - but on the site scale. Perhaps soon I can work toward extrapolating up to the level of communities, towns, and cities.

Matching a site that currently faces an extreme condition of health and resource scarcity – the Holy Child Program – with a self-sustaining design approach – Permaculture – will serve to demonstrate opportunities for self-reliance where they are thought not to exist. As a case study, this thesis could demonstrate to people who live in all kinds of resource-constrained environments that there exist natural processes, which, once observed, can model an abundance that the earth so naturally provides.

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1 ARIJ 2003



OLIVE GROVE BEIT SAHOUR

# LITERATURE REVIEW

The design recommendations included in this thesis have been crafted from a body of literature that supports a holistic approach to site design and implementation. The disciplines of landscape architecture and urban planning together demand that I ask myself why this site is ripe for intervention. The site poses problems that the literature tells me I can solve, and instructs me to do so using best practices for community engagement, ecological health, equity, and consideration for the political setting of the site. The existing site program begs for further examination of the beneficial qualities of play, therapy, healing, and productivity.



### Mission

“The Holy Child Program provides an intense therapeutic day treatment program and alternative education for children in the Bethlehem region in the Holy Land who suffer from untreated complex mental health issues and exposure to intergenerational trauma.”

“The Holy Child Program serves as a sanctuary of safety for the families of the region. The program facilitates the acquisition and development of new skills, recovery and rehabilitation from trauma, builds resiliency and instills hope for the future through a community of caring committed professionals.”<sup>1</sup>

### Healing

The core mission (above) of the Holy Child Program is to provide a therapeutic and healing setting in which children can learn and become educated and healthy young people. With this in mind it is paramount that this project first consider the call for healing through interventions of the built environment.

From a broad spiritual and philosophical perspective, Kenneth Helphand describes how “cultures have often viewed nature’s processes – the renewal of spring, the flow of water, fecundity, sensory richness, and growth – as life giving and hopeful.”<sup>1</sup> Humans have historically referred to growing, changing, wild environments as observable metaphors for renewal and rebirth.

There is also a rich but somewhat recent history of academic dialogue about built and natural environments as sources of healing. The academic foundations of this conversation were laid by Roger Ulrich who studied the impacts of exposure to nature on physical recovery. Environmental psychologists Rachel and Stephen Kaplan took Ulrich’s work further, studying human psychological

affects of time spent in natural and otherwise vegetated environments. They considered landscape preference, and the role of landscape qualities in shaping mental and emotional health. The Kaplans concluded that indeed our physical surroundings are highly influential at both physical and psychological levels, and that they can bring both negative and positive impacts on physical and mental health.<sup>2</sup>

The Kaplans found through their research that common measures of healing experienced through contact with nature include decreased levels of stress and anxiety, elevation of mood, and cognitive relief. Their theory asserts that in environments where cognitive activity is persistently required - most modern, urbanized environments - that there is a more profound need for relief from mental fatigue, more so than was required during periods of human evolution. Modern environments require that we pay attention to a constant barrage of potential threats in order to avoid bodily harm: busy roads, crowded subways, fast-moving vehicles. Everyday environments also command our attention to many varied stimuli, all at a much more condensed pace

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1 Bethlehem Holy Child Program 2014

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1 Helphand 2006

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2 Kaplan & Kaplan 1989



HOSPITAL STAFF AT JACQUELINE FISKE HEALING GARDEN, JUPITER MEDICAL CENTER, JUPITER, FL

than we experienced on the plains as early humans. Kaplan & Kaplan classified two kinds of attention through which we cycle when confronted with qualitatively different environments - directed attention and effortless attention. Between these two types of attention exist stages of fatigue and rejuvenation. Fatigue results from directed attention. Effortless attention brings relief.

Directed attention requires critical thinking, problem-solving skills, and constant attention to threats to safety. Common settings that demand directed attention are modern homes, cars, and workplaces, where tasks require unflagging and focused concentration. As humans have transitioned off the plains and into knowledge-based labor, our demands on directed attention have increased dramatically, and so with that the rate at which we experience cognitive fatigue.

Natural or otherwise vegetated environments with a diversity of life, partial enclosure, extent, and calm energy provide relief from attention fatigue by providing opportunities for effortless attention. The presence of “soft fascinations” in these environments - rustling leaves, dappled light, bobbing flowers, chirping birds -

allows the human brain to enjoy its surroundings with little or no focused attention.<sup>3</sup> These fascinations, and the experience of being surrounded by them, offer relief and the opportunity to reflect on aspects of life not at all related to tasks, deadlines, or immediate threats. These environments allow for restoration of cognitive function, and after a period of time allow the mind to regain its previous capacity for directed attention. This is called restored attention.

This research carries implications for this project because it underscores the vital importance of a restorative environment, and regular contact with that environment, to aid in processes of restoring capacities for cognitive function, patience, and caring. Without relief, people can become “less tolerant, less effective, and less healthy.”<sup>4</sup> The demands of the Holy Child Program are so great, and the environment in the West Bank so tense, that it is imperative that all available healing forces be brought to bear, so that teachers and students enjoy the deepest wells of tolerance, effectiveness, and health potentially available to them.

<sup>3</sup> Kaplan & Kaplan 1989

<sup>4</sup> Kaplan & Kaplan 1989

“[A hospital garden] fits with the holistic idea of what I think healthcare is. It’s not only medicine and physical treatment; you also have that part that’s unique to the individual called the soul. This garden helps to revive that.”<sup>1</sup>

## \_\_\_\_\_Hospital Staff

1 Cooper Marcus & Barnes 1995

Clare Cooper Marcus, academic and renowned researcher of healing gardens, brings this theory into modern healthcare environments where she tests its nuances. She and Marni Barnes, landscape architect and fellow academic, researched gardens at healthcare facilities and documented their healing and restorative benefits.

While the Holy Child Program is not a healthcare facility, there is need for healing on this site. In that respect hospital healing gardens make for ideal case studies, as they are designed to elicit precisely the same outcomes that I seek to elicit through site design at the Holy Child Program: emotional and psychological relief.

Right now the task of healing and educating HCP students falls squarely on the shoulders of its teachers and therapists - HCP children and parents look to them to provide a suite of skills not otherwise readily accessible to families in the West Bank. These trained professionals are on the front lines of providing care and healing for some very troubled students.

The Palestinian people who work at the Holy Child Program are compassionate educators, therapists, and

“Healthcare facilities are high-stress environments for staff and patients alike. Exterior environments should provide a contrast to the interior space, in order to facilitate a sense of ‘getting away.’ “<sup>1</sup>

1 Cooper Marcus & Barnes 1995

caretakers. They perform challenging tasks of caring for special needs children, all within a context of a territorial occupation and accompanying political tension. Despite the fact that many of the teachers and program administrators are themselves suffering within the state of occupation, they find pleasure and healing at the HCP, where their care for others is fulfilling and offers hope for a new generation of Palestinians.

This thesis proposes design elements and spatial experiences that will be just as healing for teachers as they are for students. Cooper Marcus and Barnes found through their research that healthcare providers - nurses, doctors, technicians - benefit from healing gardens as much as their patients. In fact, some gardens were more frequently visited by hospital staff. The authors point to the stress inherent in providing high quality healthcare, which taxes the mind and the heart. At one hospital, “the garden was highly regarded and appreciated by everyone [they] spoke with, especially by staff, who were thankful for the contrast between the indoor and outdoor environments.”<sup>5</sup>

5 Cooper Marcus & Barnes 1995

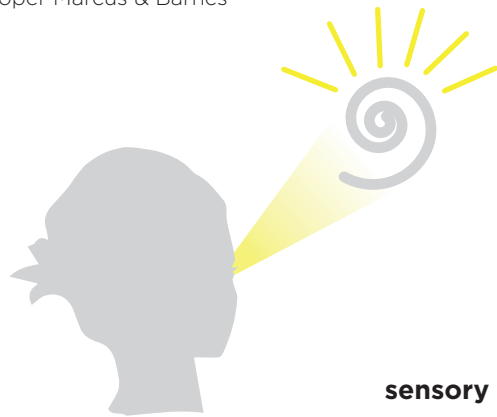
Cooper Marcus and Barnes further emphasize the vital importance of providing relief to healthcare providers by explaining that “in a demanding field such as healthcare, providing for the needs of all the participants, thereby maximizing all of the potential support-energy, is critically important.”<sup>6</sup> I have no doubt that teachers and therapists at the Holy Child Program welcome all available opportunities to “maximize potential support-energy” when it comes to caring for the wellbeing and development of their students.

It is important to note that one need not step into the remote wild to attain relief and restoration. In fact, something so simple as “looking out the window... can constitute an important opportunity for experiencing natural elements.”<sup>7</sup> Ulrich’s oft-cited study found that patients with a view of leafy trees from their hospital rooms recovered faster and required less pain medication than patients recovering from the same procedure but with views of a brick wall.

6 Cooper Marcus & Barnes 1995

7 Kaplan & Kaplan 1989

Figure 5. Key Design Aspects for Healing Gardens from Cooper Marcus & Barnes



**sensory stimuli**

Ulrich asserts that views of leafy trees impacted the patients' emotional wellbeing, and consequently, their bodies' abilities to restore physical health.<sup>8</sup> Learning from this research, we can see how a school garden, while small in size, if appropriately planned and planted could wield great benefits in terms of healing for students and their teachers. If a hospital landscape can provide respite and restoration for healthcare providers, then this wisdom could be applied to the Holy Child Program. I feel strongly that this school, a place that is called an "oasis" by teachers and students alike, has the potential to inspire positivity and optimism within the West Bank, and could demonstrate a freeing vision of self-reliance.

The research discussed so far points to specific healing qualities of hospital gardens. These are the qualities that are most impactful in bringing about desired outcomes. Among them are the assertion that "exterior environments should provide a contrast to the interior space, to facilitate a sense of getting away."<sup>9</sup> The space should be easy to understand and reassure its users that it is a safe and secure place. Seating areas should be

8 Ulrich 1984

9 Cooper Marcus & Barnes 1995



**physical + psychological movement**

clearly defined. Speaking specifically about how children inhabit these places, they recommend that there be extensive spaces, either in size or variety, for children to play where they can "let off steam" through unstructured play, but also be easily monitored by those charged with their care. Placing outdoor space next to well-used indoor spaces such as a cafeteria can allow easy and frequent access, as well as encouragement for those seeking a moment of respite in a garden setting.

Leading the effort to codify a full list of specific design recommendations, Cooper Marcus and Barnes identified three categories of critical elements or qualities of the garden, so as to best facilitate "a change of mood and lowering stress."<sup>10</sup> The three most critical aspects of designing gardens for healing and rejuvenation are [Figure 5]:

- Provide sensory stimuli that draw attention to an external focus
- Facilitate physical and psychological movement
- Create areas for both safe seclusion and social interaction

10 Cooper Marcus & Barnes 1995



**safe seclusion + social interaction**

Additional texts on healing gardens, including "Therapeutic Landscapes: An Evidence-Based Approach to Designing Healing Gardens and Restorative Outdoor Spaces"<sup>11</sup> provide specific recommendations for materials and layout, which will be listed in detail in the design Recommendations section.

11 Cooper Marcus & Sachs 2013

## The Incredible Years

The Incredible Years is a behavior modification program developed and tested by psychology professor (now emeritus) Dr. Carolyn Webster-Stratton and the Parenting Clinic at the University of Washington. They designed the program to systematically “prevent, reduce, and treat conduct problems among children and to increase their social competence.”<sup>12</sup> The program includes use of “group discussion, videotape modeling, and rehearsal intervention techniques” to demonstrate positive behavior for students and teachers alike.

The Incredible Years training series is currently being taught and implemented onsite at the Holy Child Program, where all teachers have been trained to create a classroom environment that builds emotional and behavioral competence through the Incredible Years methodology.

This training series was chosen for the Holy Child Program in response to the profound behavioral difficulties faced by its students as a result of suffering developmental disabilities and from experiencing generational, direct,

and cultural trauma. Core tenets of the Incredible Years include nonviolent discipline techniques such as timeout and ignoring poor behavior; logical and natural consequences that are small but impactful; encouragement and praise; creative play; anger management; and understanding feelings and developing feelings language [Figure 6].

Identifying the language of feelings has been particularly catalytic at the Holy Child Program in helping parents understand the complex emotions and motivations of their children. Where possible, HCP parents are very much engaged in what goes on at the school. They are required to attend parents group meetings to learn about the Incredible Years and receive training, so as to be able to provide consistent behavior modification training in the home.

Early on, when the Incredible Years was first being implemented at HCP, the Parents Group participants were asked what emotions their children might experience throughout the day. At that time the parents tended only to articulate two or three emotions - sadness, happiness, and anger. Certainly the parents

and their children experience and are familiar with the broader spectrum of emotions, but it was culturally inappropriate to call attention to them. By identifying feelings like embarrassment, shame, relief, shyness, and more, parents were better able to identify behavioral triggers and motivation, and so better able to convey empathy for the specific situations in which their children were suffering.

Speaking from personal experience, understanding the type and qualities of a difficult emotion go a long way toward understanding where it came from, and ultimately, how to deal with it. The Incredible Years program responds to innate human desire for understanding of self, and does so by helping young people develop emotional intelligence so that they may better and more productively communicate their needs, with better chances of getting them met. Acting out, after all, is a child’s coping strategy for trying to get her needs met.

From the perspective of the HCP teachers, they have together developed a mantra for reminding themselves of the quick strategies for dealing with disruptive

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<sup>12</sup> Webster-Stratton 2000

behavior: “Ignore, distract, praise.” Teachers ignore the undesirable behavior, distract to another activity or topic, and praise the child when she engages the new, productive activity. There is plenty of emphasis on listening, talking, attention, and empathy, so that the teacher keeps track of the disruptive behavior, knowing that it is possibly indicative of some underlying personal event or emotional trigger, and does not simply ignore the behavior with the hope that it goes away. Rather, the teacher addresses the behavior in the moment by ignoring it, thereby uncoupling the disruptive behavior from the attention desired, so that the child decreasingly associates her negative behavior with attention. The teacher then circles back to talk to the child about her life and her emotions so as to address them in a new conversation. While providing such thorough attention to each child may be a tall order, it is mitigated by the small class sizes at HCP, where there are five or six students per classroom.

Figure 6. Incredible Years Parenting Pyramid





## Education

With a healing and therapeutic setting in place, teachers at the Holy Child Program will find their work most impactful if the site helps facilitate instruction. Charged with relaying concepts from math, science, literature, language, art, and more, HCP staff have expressed a desire to augment classroom learning with lessons from nature. Through this site design I see the teachers making use of the variety of elements in the landscape that help tell their instructional stories in a variety of ways.

Precedents for teaching gardens abound. Where Permaculture is concerned, there is a small but rapidly developing movement aimed at deploying Permaculture principles in the school setting. One example is the school garden and Permaculture center designed by educator Michael Becker and architect Alec Holser. Together they devised and installed a permaculture demonstration site at Hood River Middle School in northwestern Oregon. The specifics will be discussed in detail in the Case Studies section of this document, but their findings show that the variety, complexity, and utility of elements brought together to form a permaculture system can yield highly instructive educational environments.

This approach is consistent with literature on best approaches to instruction. Education researcher Dr. Bruce Perry draws on modern discoveries of how the human “brain learns best,” and recommends a multi-pronged approach to delivering information to students.

Perry shares the same conclusions as the Kaplans in saying that the brain becomes fatigued after it has engaged in a certain amount of cognitive attention. Providing more specifics, he says that “only four to eight minutes of pure factual lecture can be tolerated before the brain seeks other stimuli, either internal or external.”<sup>13</sup> In order to successfully deliver new information in a classroom setting, instructors should approach their subject from multiple directions, providing facts, but also context for those facts, as well as concepts related to it. This layered instruction helps form memory, and consequently builds knowledge.

Michael Becker took these ideas (whether Perry’s or otherwise) and applied them to his school landscape, finding that his students found a greater number of entry-points to understanding course material when

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<sup>13</sup> Perry n.d.



there was a spatial context within which they could see physical manifestations of their lessons.<sup>14</sup> These physical manifestations included growing and changing plants, and the various scientific, mathematic, artistic, and poetic functions of a green building that incorporates rainwater harvest and solar power.

Undergirding Becker’s design approach is Dr. Perry’s assertion that “when a child is in a familiar and safe situation, as in most of our classrooms, his or her brain will seek novelty.”<sup>15</sup> The growing, changing, seasonally evolving educational setting, when full of instructive but benign changes - such as growth of a nurtured tree or death of an unwatered eggplant - offers a multitude of novel encounters that have potential to sustain attention for learning and thereby teach so much.

The act of caring for a landscape and its elements can also aid in the learning process. One of the strategies suggested by Perry is to “engage students with a story to provide the context. Make sure that this vignette can

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<sup>14</sup> Holser & Becker 2011

<sup>15</sup> Perry n.d.



touch the emotional parts of their brains.”<sup>16</sup> Nurturing a plant provides such opportunity for an emotional experience, in that the caretaker feels responsibility for its health and growth, and may feel joy in watching the plant thrive. Perry says that activated emotions “prepare the cognitive parts of the brain for storing information. Information is easiest to digest when there is emotional ‘seasoning’ - humor, empathy, sadness, and fear all make ‘dry’ facts easier to swallow.” This project will focus on emotions of empathy and opportunities to care for the landscape and its elements as elicitors of emotional experience.

16 Perry n.d.

### Play

Research on children’s play shows that regular engagement in play is vitally important to a child’s healthful social and cognitive development.<sup>17</sup> The United Nations identifies play as a fundamental right for children, pairing it in importance with education as an endeavor. Play should be “free and compulsory,” in a way that encourages each child to develop her “general culture and enable [her], on a basis of equal opportunity, to develop [her] abilities, [her] individual judgment, and [her] sense of moral and social responsibility, and to become a useful member of society.”<sup>18</sup> These assertions are supported by the literature, which says that opportunities for age appropriate play have significant outcomes for the health and thriving of a child.

The journal *Pediatrics* enumerates specific benefits of play, calling it “essential to the social, emotional, cognitive, and physical wellbeing of children beginning in early childhood. It is a natural tool for children to develop resiliency as they learn to cooperate, overcome challenges, and negotiate with others. Play also allows

17 Milteer et al 2012

18 United Nations n.d.



children to be creative.”<sup>19</sup> International dialogue aimed at peaceful solutions to conflict calls on leaders to be cooperative and adept at negotiating solutions that benefit everyone. Raising children to be these leaders, through encouragement of abundant, joyful, and instructive play, is one of the long term goals of the Holy Child Program.

Looking deeper at varieties of play, the literature also tells us that outdoor play, unstructured play, and play among natural features such as vegetation can further bolster its beneficial effects. This thesis proposes a rich outdoor play environment with elements that are targeted at age-appropriate needs for structure, variety, social interaction, privacy, and physical exertion.

These design decisions rely on the findings of researchers like Nancy M. Wells, who looked specifically at “greenness” in the environment and its impact on children’s cognitive and social development, imparting many of the same benefits found by Ulrich and the Kaplans, but with respect to children’s play areas. Additional work shows that naturalistic playgrounds

19 Milteer et al 2012



WWI TRENCH GARDEN, GERMANY



enhance the benefits of play. A University of Tennessee research team found that “children who play on playgrounds that incorporate natural elements like logs and flowers tend to be more active than those who play on traditional playgrounds with metal and brightly colored equipment.”<sup>20</sup> This is a crucial consideration when looking at opportunities to craft and furnish play environments. Research tells us that a more naturalistic playground, when thoughtfully and carefully planned, can do more with fewer financial resources, or with resources that serve multiple purposes. Naturalistic elements can bring delight and offer educational opportunities in addition to providing a play environment. From a philosophical and spiritual perspective, play is associated with “pleasure, joy, abandon, innocence, and freedom,”<sup>21</sup> all desirable experiences for children and adults alike, of which Palestinian children find themselves in short supply.

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20 University of Tennessee at Knoxville 2012

21 Helphand 2006

### **Gardens Among Conflict**

In his book *Defiant Gardens: Making Gardens in Wartime*, Kenneth Helphand reveals a taxonomy of human relationships with nature that have helped lift the human spirit in times of pronounced oppression, in this case through cultivation of gardens. Gardens are not wild nature, but they are the collaboration between human and nature, a symbiosis between nature’s forces and human ingenuity for beauty and productivity. For the religious of spirit, gardens may refer to a time and place before human sin: “Eden... a place without any anxieties or dangers, and certainly without death.”<sup>22</sup> The first garden was the first home of humanity, a place held in reverence in the Christian psyche, a place of purity, peace, and harmony.

In terms of livelihood, gardens offer a release from formal economic transactions. A community can potentially free itself from a global or industrial food system by growing its own food, therefore controlling the elements that determine its own health and nourishment. Human survival can be localized and feeding no longer dependent on an invisible and global supply chain.

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22 Helphand 2006

Many Palestinians are already finding freedom through local agriculture. One describes how a food garden can allow him to persist despite the actions of the outside world:

“If people start having their own food ... [the Israelis] can make a curfew. They can shut down the whole country. I don’t care because I have everything around me,” Khufash says. “This is resistance to the occupation because I don’t need to buy your food. I don’t need anything from you.”<sup>23</sup>

In this way the garden equals self-reliance and self-sufficiency, not in the individualistic way, but in the way that communities can be composed of many individuals and can work together to provide for every last one of them, without help from a corporate or formally political entity. A garden can satisfy the very basic of Maslow’s hierarchy of needs, can nourish, provide shelter, water, and waste processing.

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23 Reidy 2013



BULLOCK'S PERMACULTURE HOMESTEAD, ORCAS ISLAND, WA

### **Productivity as Healing**

Education, play, and empowerment are significant goals for site design, but where this thesis moves beyond many of its precedents is by calling for healing through productivity. There is a robust layering of services and therapies taking place there, above and beyond the services provided at schools elsewhere in the region.

I propose that the landscape participate more in this productivity effort. It has proven to provide so much in the past, through olive groves, citrus trees, and other fruit and vegetables, but there is room for it to do so much more. There is a window of opportunity for the land to provide a source of community livelihood, through intensive cultivation and harvest of food, fiber, and energy.

### **Agriculture in Palestine**

The Palestinian people enjoy a rich cultural heritage of closeness with the land. Land ownership and agricultural cultivation bring great pride to families, as they are seen as signs of perpetual prosperity. As the Israel-Palestine conflict took hold in the late 1940s, land ownership

became ever more important to Palestinian families.<sup>24</sup> The conflict caused many to flee their homes, while other properties have been and continue to be bulldozed by Israel. As a result, far fewer families can now lay claim to the places that their ancestors called home. A secure deed to property has turned into a rarity, and now represents stability within a context of widespread instability.

A quick survey of the urban fabric in Beit Sahour and Bethlehem shows that much of the land is divided into agricultural estate parcels, with a large residence surrounded by an olive grove or other agricultural use. A residence that shares land with an agricultural plot represents and oftentimes functions as a source of income for the land owner, who may harvest olives and press them for oil.

The value of agriculture in the West Bank is a shifting concept for both land owners and those who work in the industry. Much of Palestine's agricultural activity is informal and subsistence, where those who grow food are the same who rely on it for sustenance. There is little money or additional livelihood gained through their

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24 Migdal 2014

operations. At the same time, agriculture has historically comprised a relatively large portion of Palestine's export sector, pointing to the fact that in addition to widespread subsistence farming there is a high-functioning industry. The industry, however, is declining.

A 2012 report prepared by the Council for European Palestinian Relations (CEPR) goes into depth about how agricultural practice is changing in the Palestinian territories. Its authors point to Israel's constriction around exports from Palestine as well as control of the resources within the territories:

"This results in a complex situation of interdependency with strong negative effects on the Palestinian agricultural sector. A major reason for Palestinian economic dependence on Israel has been the lack of export market access for Palestinian goods and the Israeli restriction on the flow of goods from abroad."<sup>25</sup>

Adding to the state of agricultural decline is fragmentation of industry networks and stakeholders who could otherwise work toward strengthening collective economic efforts. The CEPR report points to lack of training opportunities and scarcity of loans available

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25 CEPR 2012

“Agricultural activities in the occupied Palestinian territories (oPt) are characterized mainly as family-based production activities to subsist household needs. More than half of both plant and livestock production are mainly for domestic consumption, 23% to sell the surplus after meeting the domestic consumption, and only 20% for direct sale.”

“Due to the Palestinian family inheritance land ownership system and Israeli land confiscation policies, agricultural holdings in the oPt are getting smaller and increasingly fragmented.”<sup>1</sup>



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1 CEPR 2012

for infrastructural investments as conditions that limit the health of the agricultural industry. These conditions are brought about by instability of the territories, where investment is considered particularly risky.

As will be discussed further in the Site Analysis, the Palestinian people endure a very unstable economy with high unemployment. Highly correlated with unemployment are feelings of despair, hopelessness, depression, and poor health. Stated in the inverse, those who are employed enjoy better health and prospects for emotional fulfillment than their unemployed counterparts.

One group that actively advocates for agricultural resurgence is the Palestinian Agricultural Relief Committee (PARC). Its primary goals of operation include two primary objectives:<sup>26</sup>

1. Enhance the economic role of the agriculture sector by achieving food security and sustainable agriculture;
2. Reinforce the sustainability of grassroots, institutionalized and specialized rural community based organizations.

This site has great potential to heal psychological wounds, particularly those hardships exacerbated by widespread unemployment. In addition, the productivity of the site can provide healing to the students, teachers, and families who frequent the site. Seeing vegetables and fruit as they grow and go to market is a life-giving experience, as it shows how very small seeds can become food through patience and directed effort.

It is clear that agriculture is seen as a viable opportunity for self sufficiency and economic development, but lacks the kind of coordination and investment that might bring the industry into a more robust functional state. It is also apparent that grassroots organizations are considered as important as industrial agriculture, which holds promise for this project.

In order to bring about all of these conditions within one design plan, I call on the Permaculture model, which was designed to be highly productive. And as a framework for environmental design, permaculture has plenty of room for including playful, educational, and healing elements in the network of its system.

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26 CEPR 2012

## Permaculture Threefold Ethic

1. Care of the Earth
2. Care of People
3. Shared Yield

## Permaculture Design Principles

1. Creatively Use & Respond to Change
2. Observe & Interact
3. Catch & Store Energy
4. Obtain a Yield
5. Apply Self-Regulation & Accept Feedback
6. Use & Value Renewable Resources & Services
7. Produce No Waste
8. Design from Patterns to Details
9. Integrate Rather Than Segregate
10. Use Small & Slow Solutions
11. Use & Value Diversity
12. Use Edges & Value the Marginal

## Permaculture Principles of Energy Efficiency

1. Each element shall perform multiple functions,
2. Each function shall be supported by many elements,
3. The relative location of elements is chosen so that it is appropriate for their role in the system.

Table 2. Permaculture Ethics & Principles

### Permaculture

Permaculture is a sustainable, closed-loop design approach that makes use of readily available resources, energy, and human labor to bring about a site that can be self-sufficient.. The term itself is a contraction of two sets of words:

#### **permanent + agriculture** **permanent + culture**

Bill Mollison and David Holmgren, as the visionaries who coined the term, presented their design approach in writing and through workshops, where they discussed a network of values that shaped the Permaculture model as it is today. This is reflected in Permaculture's "threefold ethic: care of the earth, care of people, and dispersal of surplus time, money, and materials towards these ends."

The Palestinian people are known for taking great care of one another and for sharing their surpluses with each other. Unfortunately care for the earth is an increasingly bleak endeavor, as the land is tending toward desertification as Israel drains the region's natural

aquifers and confiscates Palestinian agricultural lands.<sup>27</sup> Israeli settlements continue to spring up where before there were pastures, wooded land, and fertile agricultural fields. Care for the earth is not a readily available consideration for many Palestinians; like many societies struggling for survival there is greater focus on health and safety.

But then the same could be said of any developed, industrialized society today, and so it is appropriate for us to look to those places where sustainable systems have been developed in the midst of unsustainable societies. Permaculture education and demonstration sites exist all over the world. Although it is difficult to be certain about the number of permaculture sites in operation, an internet-based advocacy organization called the Permaculture Worldwide Network has registered 1399 projects around the world, with eleven in the Israel-Jordan-Egypt region. It is clear that permaculture is an approach that has tested value across varied climates.

The tenets of permaculture include the threefold ethic already discussed as well as basic energy efficiency principles that help meet site needs most efficiently. The threefold ethic expands into twelve design principles [Table 2 & Figure 7].

This design has been developed while considering all of these design principles and each element has been tested against them. The approach is certainly an ambitious one, but the gravity of living in a parched land with internal strife calls for such a comprehensive, intensive approach to improving quality of life there.

When considering what elements to place in the landscape, a Permaculture designer conducts a needs and yields assessment of all functions and elements already there, and of those elements that are desired for the new landscape. For example, for this site I looked at the needs and yields of a vegetable garden plot. Some of its needs are water, tending, nutrients, mulch, sun, and cover from extreme conditions. Some of its yields are food, educational opportunities, intrigue, joy, soil stabilization, and soil nutrient deposits.

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27 Ghanma 2012

Permaculture is an ecological design system that draws heavily from indigenous, local wisdom as well as cutting edge science to help individuals and communities maximize local resources toward sustainable production, generation, and recycling of food, water, energy, housing, and other resources.<sup>1</sup>

1 Marda Permaculture Farm 2014

Permaculture also makes stipulations about the importance of energy conservation and appropriate use of technology. There are three basic principles of energy efficiency shown on the previous page. These are the principles that call for functional redundancy in a system. Each element shall provide a function that another element provides as well, so that if one element fails the other will continue to function in its place, making that function resilient to disturbance.

These principles also call for enhanced efficiency. Each element performs more than one function, so that maximum yield is obtained from the hard work of introducing and maintaining any one element.

Where there were gaps in the system, this design introduces appropriate elements that meet needs while using available yields. As an example, the planting beds on this site perform multiple functions by producing food, enriching the soil during fallow seasons, absorbing rainwater, and providing therapeutic effects. Each of those functions, if considered essential, will then need to be supported by multiple elements. Food will need to be produced in more than one way, and on this site it is

# Permaculture Ethics & Design Principles

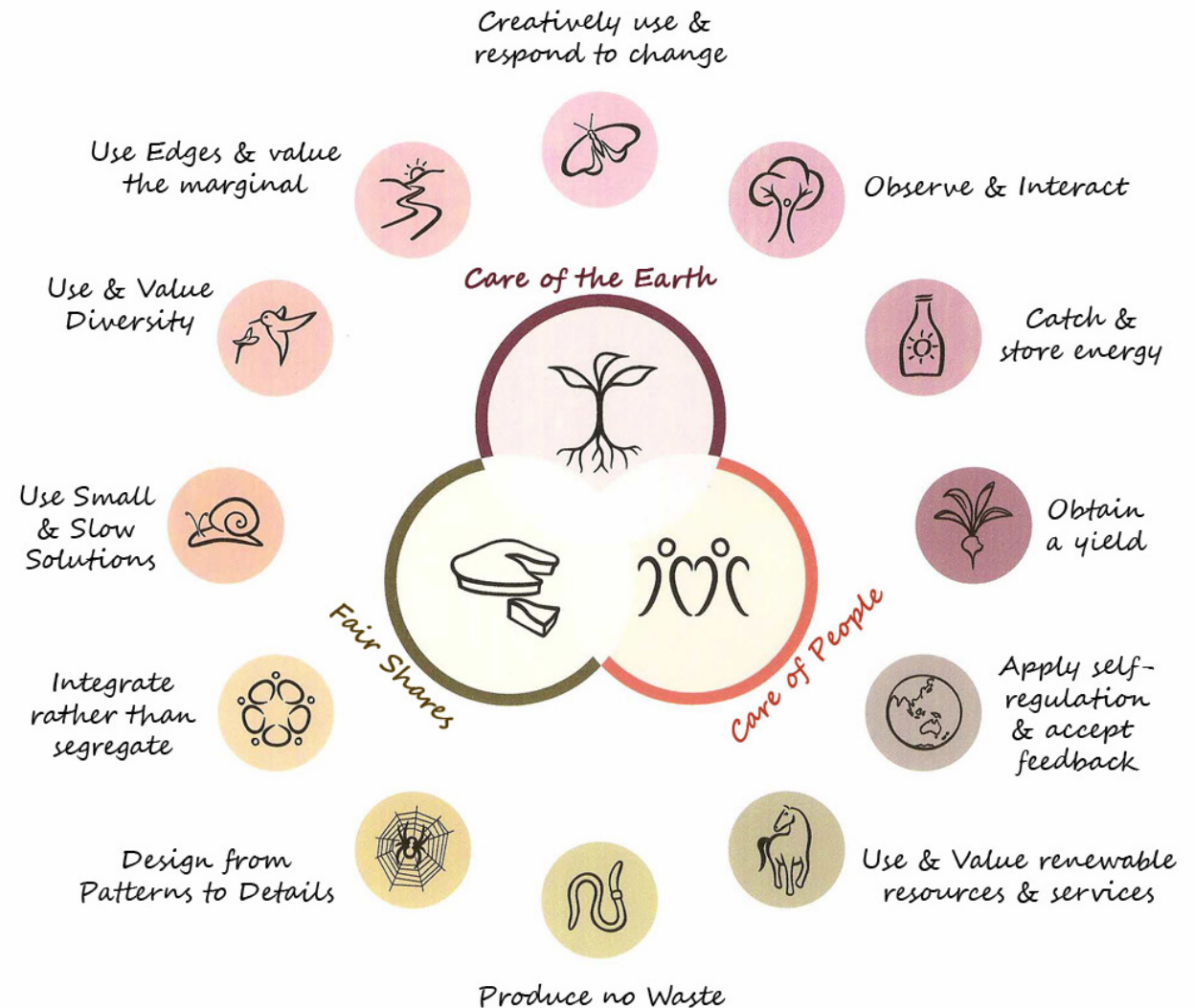


Figure 7. Permaculture Ethics & Principles - Diagram



HOLY CHILD PROGRAM CHILDREN AND STAFF

“Permaculture design aims to minimize waste, human labour, and inputs of energy and other resources, by building systems with maximal benefits between design elements to achieve a high level of holistic integrity and resilience.”<sup>1</sup>

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1 Rhodes 2012

produced by trees in the orchard, planting beds in the ground, and chickens to be used for meat and eggs. My task in applying the Permaculture model to this site is to match all of the needs of the site to other elements in the system that meet those needs. And so on, and so forth.

The literature makes a case for the importance of nature contact in providing healing and therapeutic environments, for naturalistic playscapes, and for educational environments that are varied and stimulating. And Permaculture allows us to provide all of this on a site that is productive and efficient. The design and implementation plan for this project should manifest all of these qualities, and so we will look at how that is done.

### **Confluence in the Landscape**

Bringing together the elements of concern, play, healing, education, empowerment, and permaculture, Kenneth Helphand describes how together these elements are greater than the sum of their parts. “In examination of children’s play in ghettos, concentration camps, and wartime hiding places, [it was] discovered that play was an ‘enterprise of survival, a defense of sanity and a demonstration of psychological defiance.’ Could we not think of the garden thus, too?”<sup>28</sup> Helphand shows us how to expand our understanding of the garden from a place that of passive enjoyment to a place that reinforces efforts to grasp empowerment and productivity.

In fact, as the Permaculture model tells us, a collection of symbiotic elements can operate in concert with one another in such a way that each enhances the function of all other elements. Healing is made more pronounced in a garden where there is play and productivity because these programmatic components each convey healing properties in their own right.

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28 Helphand 2006

Play is more universally enjoyed where there is variety in tempo, points of entry, scale, number of participants, and elements of engagement.

A child can play in a tree at the same time that it derives knowledge of its species qualities. She can enjoy it alone or with others, and there could be a tree that is just her size when she is five years old, and another for when she is ten, and yet another when she is fully grown. That tree may produce fruit that is nourishing and flowers that are beautiful. She may sit in that tree and contemplate its wonder, or a view from its high branches, or swing from its limbs and exert and build strength.

The variety and complexity inherent in the permaculture system are overwhelming at times, but this is why the vision unfolds over the long term, why the design is slow and incremental, so that all of this can be understood and appropriately applied through intentional interaction with a site.



BUSTAN GARAAQA



**BUSTAN QARAAQA**



**MARDA PERMACULTURE FARM**



**RIWAQ**



**L'ABRI COFFEEHOUSE**



**HOOD RIVER MIDDLE SCHOOL**

# CASE STUDIES

So why aren't Palestinians already engaged in Permaculture?

It turns out that some are. There are at least two active Permaculture sites in the West Bank. In addition to Permaculture installations there are small-scale, community powered efforts to grow food, preserve local culture, and employ young people in empowering ways that help them build skills and find fulfilling outlets for their energy and creativity.

The interventions posed by this thesis build on healing processes already underway. They build on a training program already established and functioning onsite, and that program is specifically targeted at replacement behaviors. Many sites are doing similar work, but perhaps not identifying it in this way. This project seeks to bring together the network of resources already available in the West Bank. Here I propose a new network of collaborators, folks who are already hard at work building expertise in the region. All that we need has already been invented, we just need to work at bringing those threads together on this one unique site.

The political climate of the Middle East is undeniably the most discussed aspect of that region, particularly from a Western perspective. There is unflagging conflict and regular incidences of violence that plague the people and their safety. There are those who claim to be oppressed, those who deny being oppressors, enemies and allies on both sides, and all manner of negotiators and mediators in between. There are innocent bystanders who are collateral damage in the conflicts - civilians who are neither politicians nor members of either military, but who suffer tremendous losses nonetheless.

Most civilians fall within this category, as those who neither started nor carried forward conflict, but nevertheless suffer greatly from political battles. The Holy Child Program and its community is comprised of these innocents, everyday Palestinians who do not participate in the political events of the region, but who endure the consequences. As is the case in most cultures across the world, this corps of everyday people want simply to live productive lives free from suffering and full of friendship, love, and productivity. And yet this majority is not a force that gets its way. Geo-politicians certainly have answers for why this is the case, but that is not within the scope

of this project. The primary political concern is that there are a select few who make nation- and region-wide decisions, and a great many who make no decisions at that scale and yet they endure their consequences. When these consequences are particularly dire, then there is a state of oppression, where groups of people are controlled and kept in markedly abusive circumstances from which they are not readily liberated.

The history of oppression matches that of humanity in duration; it has existed so long as people have settled together. Extreme cases are slavery, genocide, and mass imprisonment. More readily tolerated occurrences of oppression (and those more palatable to onlookers) are racism, sexism, classism, and a bit more extreme, apartheid based on these human characteristics. I say that these are more palatable so as to refer to the fact that so many people live in societies where these kinds of oppression are commonplace, and yet the international community does not widely regard them as conditions requiring immediate and decisive action.

## **Additional Sites (Not Discussed in Detail)**

### **Kibbutz Lotan, Lotan Israel**

<http://www.kibbutzlotan.com/>

### **Jordan Valley Permaculture Project**

<http://permaculturenews.org/2009/12/11/greening-the-desert-ii-final/>

[http://www.proactnetwork.org/proactwebsite/media/download/CCA\\_DRR\\_reports/casestudies/em.report.e\\_9.pdf](http://www.proactnetwork.org/proactwebsite/media/download/CCA_DRR_reports/casestudies/em.report.e_9.pdf)

Many claim that Palestinians suffer an oppression that includes all manifestations mentioned. Palestinians are imprisoned and murdered with some regularity. They are stopped and questioned by Israeli authorities primarily because of their race and/or nationality, and they are very literally confined to a region that is largely controlled by the Israeli military. The power dynamic very much favors Israeli citizens over Palestinians. Israel, of course, is not without its victims. Many have died and been traumatized by violence brought by Palestinians, but it is impossible to deny that Israel has the upper hand.

With all of this in mind, it is important for me to acknowledge the oppressed on both sides of the Israel-Palestine conflict in my approach to this project. Both have suffered so much in terms of bodily and psychological harm. Jerusalem is a very tense place for both Israelis and Arabs who live there, Palestinian or otherwise. There are no outright “winners” in a state of conflict; everyone loses through adjacency to violence and suffering.

For these reasons I seek to make this work useful to Palestinians and Israelis alike, to everyday people who seek no political gain as the conflict carries out, but rather seek health and wellbeing, love, safety, security, and prosperity, and not power or dominion over others.

Considering that the oppressed exist everywhere, regardless of culture or nationality, it is empowering to take lessons from the varied precedents of defiance, where the oppressed have exercised their own agency where it might otherwise be thought not to exist.

Time and again human agency and empowerment have been derived from our ability to harness forces of nature; it is our legacy as survivors of natural selection. So many of the oppressed throughout history have recognized this fact, and taken it upon themselves to find their freedom, their liberation, their agency, and their empowerment through collaboration with nature.

## **Marda Permaculture Farm Mission**

“The project seeks to promote ecological, cultural and economic resilience in the Occupied Territories by continuing to develop our small scale permaculture site to serve as a model and training center for local farmers and international permaculture students. The Farm aims to be a model of sustainable development and self-sufficiency for the whole of Palestine, and to build connections with permaculture projects regionally and internationally.

The primary objectives we are working towards through our project include building bottom-up green local economies and increased local food production, water harvesting and recycling, and small scale manufacturing for the people of the rural West Bank. We are looking forward to develop the farm to be a cell of a holistic green bottom up green economic body, using its regenerative economy as vehicle for change and as social-ecological medium to connect Palestinians with each other and their environment.”<sup>1</sup>

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1 Marda Permaculture Farm 2014



**SCARECROW AT MARD PERMACULTURE FARM**

# Marda Permaculture Farm

Permaculture in Palestine

# MARDA PERMACULTURE FARM



Marda Permaculture Farm is a working permaculture farm in the town of Marda, Palestine. It was founded in 2006 by permaculturalist Murad Alkhufash as a site for practicing and demonstrating sustainable agriculture techniques.

Marda provides a variety of services, including intensive Arabic language classes and cooking workshops aimed at contextualizing their work in Palestinian culture and food traditions. They offer Permaculture Design Courses (PDCs) in Arabic, one of the few to do so.

Some of the objectives of Marda Permaculture Farm are to empower Palestinians to provide for themselves despite a state of occupation. Mr. Alkhufash sees his work as a form of political resistance, by demonstrating self-sufficiency, thriving community relationships, and health in a place where human dignity is regularly damaged by a powerful, occupying force.

**‘If people start having their own food ... [the Israelis] can make a curfew. They can shut down the whole country. I don’t care because I have everything around me,’ Khufash says. “This is resistance to the occupation because I don’t need to buy your food. I don’t need anything from you.”<sup>1</sup>**

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<sup>1</sup> Reidy 2013

This site and its permaculture practitioners could make for great partners for the Holy Child Program as it seeks to develop a permaculture system that is consistent with local ecologies and agricultural traditions. Furthermore, many of the goals of the farm, which include promoting healthful and green economies in the West Bank, teaching Palestinian agricultural heritage, and resisting oppression through self-sufficiency are very well aligned



**WORK CREW AT MARDA FARM GREENHOUSE**



**WORK CREW AT MARDA FARM GREENHOUSE**

## **Key Takeaways**

### **Permaculture is Possible in Palestine**

Permaculture is feasible in Palestine's semi-arid climate.

### **Permaculture Training is Available to Palestinians**

Bringing the Permaculture method to the HCP site could be accomplished by training the HCP groundskeeper and other interested staff and community members at one of Marda's annual Permaculture Design Courses.

### **Permaculture is Culturally Appropriate for Palestine**

Marda demonstrates holistic approaches to teaching Permaculture design alongside Palestinian agricultural practice and cultural heritage - the specifics of this approach could be replicated onsite at the HCP.

### **Local Experts Are Available to Help**

Marda Permaculture Farm is a well-established Permaculture demonstration and instruction site that can lend its expertise to the HCP community as it develops its Permaculture system. We can look to them for guidance.

### **Permaculture Can Be Empowering**

There is a corps of Palestinians who regard their rich agricultural heritage as an asset that can be accessed and used to build self-reliance, resilience, and empowerment despite a state of occupation.

“Based in Bethlehem in the West Bank, Bustan Qaraaqa is a permaculture project promoting sustainable, creative solutions to problems of environmental degradation and food and water insecurity facing the

local community. We experiment on our farm to develop appropriate technologies and practices to promote and implement with our community partners to help them to keep their homes, access natural resources and protect their community and the quality of the local environment.”<sup>1</sup>

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1 Bustan Qaraaqa 2014



WORK CREW AT BUSTAN QARAQA



# BUSTAN QARAAQA



Bustan Qaraaqa is another Permaculture demonstration site located in the West Bank. Sited in Bethlehem, this working farm and teaching facility is rather close to the Holy Child Program. The two are less than a ten-minute drive from one another. Permaculturalists at Bustan Qaraaqa engage in ongoing research to develop best practices for water harvest, water cycling, nutrient cycling, planting communities, and more. Their research culminates in publications that they disseminate freely through their website. Publications include “Agroforestry for Palestine: Good trees for a better future,” “Trees of Palestine,” and “Frost Tollerant [sic] Trees.” Bustan Qaraaqa also offers yearly Permaculture Design Courses in English and Arabic, and invites interns to join their farm to build expertise and carry out needed projects.

This site provides something of a cautionary tale for folks interested in practicing permaculture within culturally sensitive contexts. During my visit to the HCP in April 2014, I dropped in to talk to the permaculturalists there, but there was nobody home. Our host was not readily inclined to bring us to the site because there have been reports of unsavory activity going on there, activity that is not consistent with the values of the HCP’s religious communities.



PERMACULTURE DESIGN COURSE AT BUSTAN GARAQA

## Key Takeaways

### Plant the Water First

The West Bank's dry climate and sparse precipitation mean that plants receive very little natural irrigation. Planting the water first means installing water harvest, storage, and irrigation before making investments in new plantings.

### Design with Wildfires in Mind

The West Bank is dry and windy, and prone to wildfires. Planting wind breaks and barrier vegetation can help prevent wildfires from spreading to the HCP site.

### Seedlings and Starts are Available in Palestine

Bustan Qaraaqa grows vegetable starts and other seedlings and sells them to local farmers and households. The HCP can take advantage of this local resource, particularly during the early stages of its own permaculture installation.

### Species Diversity Yields Resilience

Experimentation with diverse plant communities and encouraging diverse human communities has brought greater resilience to this food and fiber production system.

### Practice Cultural Sensitivity

Permaculture often carries certain lifestyle connotations that may be incompatible with their surrounding cultures. The system shall adapt to the culture, not vice versa.



**BQ WORKER STACKS EARTHEN BRICK**

“The facilities of the coffeeshouse [sic] include 2 sitting areas, a multi-purpose room, a library, a sitting area outside, and a small underground cave.”<sup>1</sup>

1 L'Abri Coffeeshouse 2013



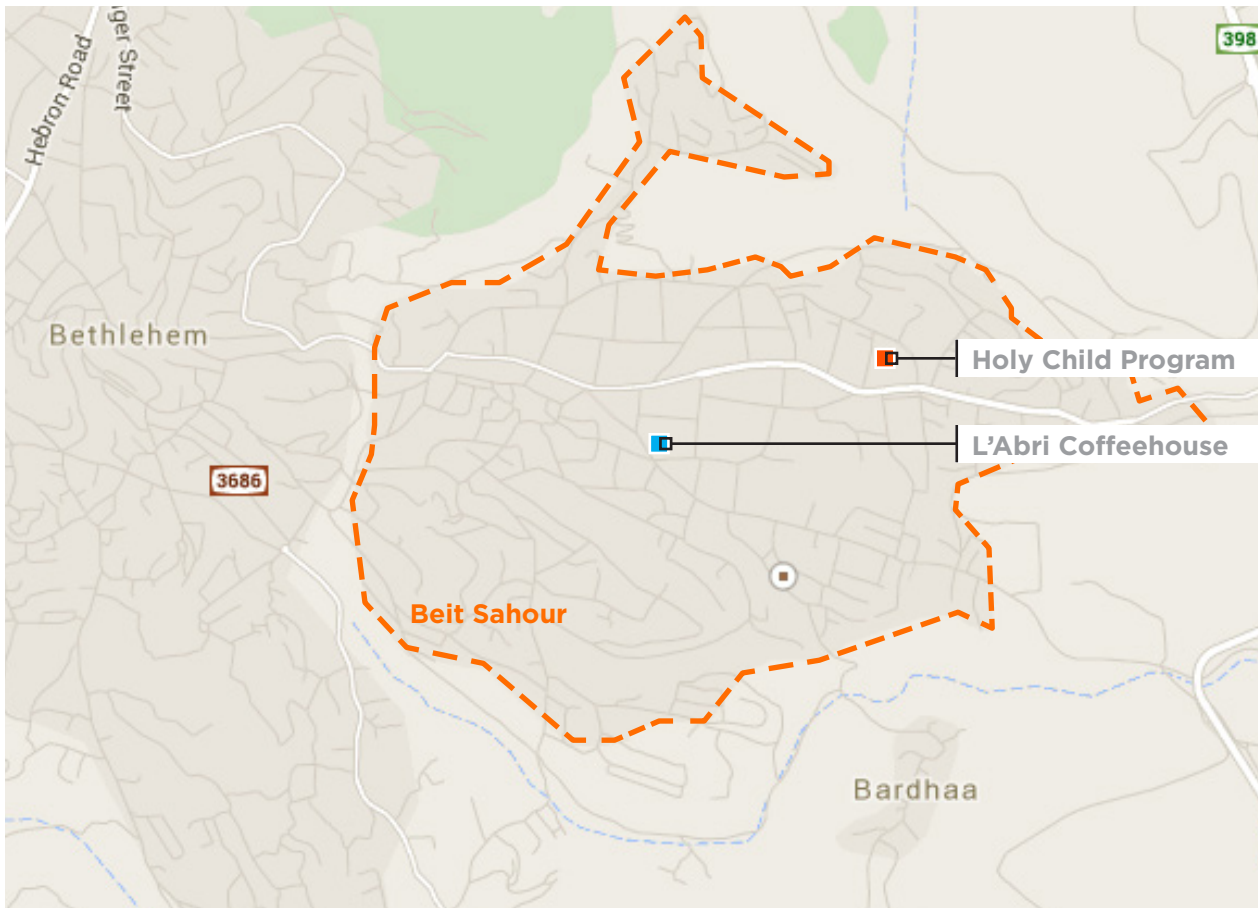
**GREYWATER TREATMENT SYSTEM**



**GROUP ACTIVITY IN THE GARDEN**



# L'ABRI COFFEEHOUSE



L'Abri Coffeehouse is a small cafe located in Beit Sahour, not far from the Holy Child Program. L'Abri serves coffee, tea, sandwiches, salads, and a small amount of alcohol. It is oriented toward Christians in Beit Sahour. The program serves food and drink to its patrons as well as opportunities to employ and engage young community members. The Coffeehouse is a meeting place for the Bethlehem Study Center, where Palestinians from Beit Sahour and nearby towns come to study, read, and share ideas. Young people are encouraged to discuss faith, philosophy, theology, and culture, and the arts. Images from the program Facebook page show students playing games and harvesting food from the cafe garden.

In addition to the robust intellectual program ongoing at L'Abri, there are horticultural and agricultural educational opportunities available here as well. There are small-scale demonstrations taking place onsite, where students and cafe employees work together to build and maintain aquaponic food growing systems. There is a vertical vegetation structure made from PVC pipe, wicking beds with lettuces and greens, and a greywater treatment system that incorporates fish into its cleansing and fertilization cycles.

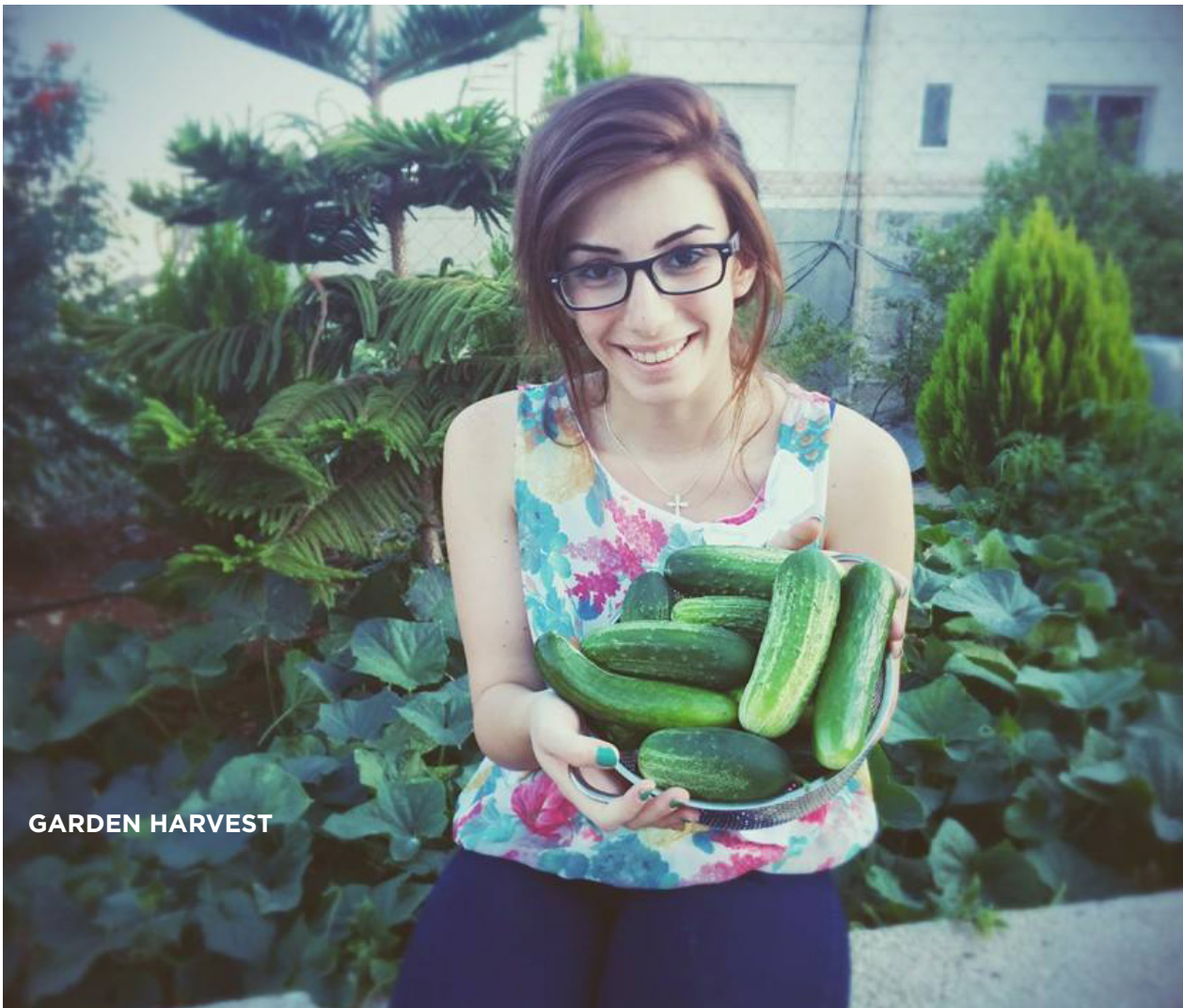


VERTICAL VEGETATION STRUCTURE



**ORGANIC TILAPIA GROWN ONSITE**

L'Abri provides an excellent example the kinds of interaction of interest to young Palestinians, particularly with respect to early employment and experimentation with community engagement and small-scale agricultural practice.



**GARDEN HARVEST**

## **Key Takeaways**

### **Faith-Based Community Efforts Appeal to Young People**

L'Abri Coffeehouse has a strong mission of encouraging dialogue about faith and Christianity. But this work is not mutually exclusive of discussions about sustainability and environmental ethics - in fact, the two reinforce one another.

### **Experimental Agriculture Is Fun for All Ages**

Palestinian students are getting their hands dirty learning about local, sustainable agricultural systems that provide healthful food through small acts of human and natural ingenuity. These systems are also beautifully made and appeal to young people through their charming aesthetic.

### **Mixed Programming Offers Multiple Points of Entry**

This cafe is a meeting place, a workplace, a space for talking, for growing food, and for learning about the cycles and responsibilities of adulthood. The layered programming here offers varied points of intrigue for students with different backgrounds and interests.

### **DIY Interventions Allow for Communal Learning**

Many of the furnishings and much of the agricultural infrastructure onsite are made by the people who work or visit. These projects allow all interested parties to learn construction methods and to experiment with their own ideas for how the work ought to be approached.

“RIWAQ designs and facilitates cultural, educational, and community-based activities in each of its respective sites. Our activities are designed to foster participation and engagement of local communities in the rehabilitation projects taking place in their town, and are committed to raising awareness of the power of cultural heritage and its ability to bring people closer together.”<sup>1</sup>

1 RIWAQ 2014



INTERIOR RESTORATION

“RIWAQ’s ‘Job Creation Through Conservation,’ for example, has transformed cultural heritage into an important economic tool, and shifted the concept of architectural conservation from an activity exclusive to affluence, to one that provides skill-building opportunities for residents, and community economic development for neighborhoods, villages, and municipalities.”<sup>1</sup>

1 RIWAQ 2014



NEW PLAZA TILEWORK



RIWAQ



**“Contributing to a more resilient social infrastructure”**

RIWAQ is a robust architectural historic preservation program that aims to celebrate Palestinian cultural heritage through restoration of historic and culturally significant buildings. The program was founded in 1991 and its headquarters are in Al Bireh, Palestine (West Bank), although they work all across the region.

One of RIWAQ’s most celebrated efforts was a thirteen-year (1994 - 2007) research and investigation project assembling the Registry of Historic Buildings. This work resulted “in the publication of three volumes that include detailed histories, maps, and photos of approximately 420 villages in sixteen districts across the West Bank, Jerusalem, and Gaza.”<sup>1</sup> The Registry includes 50 Historic Centers, and counts Beit Sahour among them. Near the Holy Child Program in Bethlehem, RIWAQ has restored Marcos Nassar Mansion, by thoroughly cleaning and repainting the elaborate patterns on the walls, restoring the tile work, and rehabilitating windows, doors, lighting, and more.

1 RIWAQ 2014

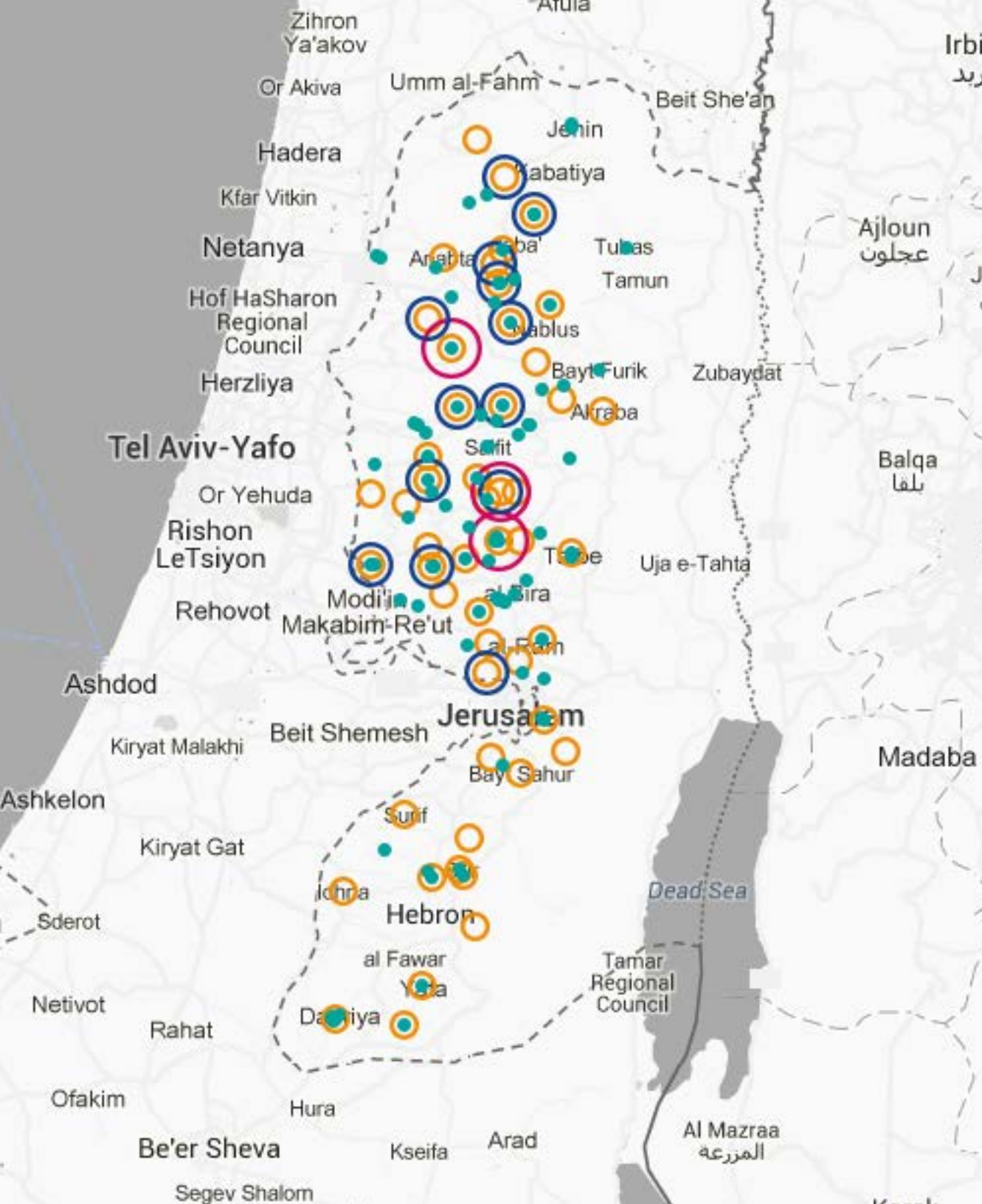


Figure 8. RIWAQ Restoration Sites Across the West Bank

- 50 Historic Centers
- Throne Villages
- Historic Center Rehabilitation
- Historic Building Conservation

RIWAQ staff talk about their work as providing moral support to Palestinians.<sup>2</sup> The project trains and employs Palestinians in a rich cultural trade as it restores buildings and public spaces for children, families, and community events. The process of identifying preservation projects and then restoring them to their original beauty elevates Palestinian culture through attention to artifacts not otherwise considered deserving of time and attention.

RIWAQ staff describe how this work takes Palestinian talent and naturally available materials and puts them to collective use in a culturally regenerative way. “We use environmental material, we use organic material, we use locally produced material. We don’t import any new material to make Palestine more beautiful.”<sup>3</sup> In short, this group identifies the local, ready abundance of talent and materials and through human ingenuity puts them together for a transformative result.

Going further, members of RIWAQ talk about how

<sup>2</sup> RIWAQ Curry Stone Design Prize 2012

<sup>3</sup> RIWAQ Curry Stone Design Prize 2012



## CHILDREN'S ACTIVITY IN A RESTORED SPACE

their work of celebrating Palestinian heritage, and doing it on their own terms with their own talents and materials, is liberating in its own way. Referring to the occupation, RIWAQ Co-Director Khaldun Bshara says that “colonization does not take place in a territory, it takes place here: [points to head]. If you are free here, nobody can colonize you. Space is essential to have this freedom in mind.”<sup>4</sup> This is what RIWAQ creates: space for freedom of cultural expression and celebration.

“We don’t want to neither gentrify these historic centers nor make them museums. We want the people who live there, to help them, in such a way that they can make use - their children can make use - of the historic centers.”<sup>1</sup>

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1 RIWAQ Curry Stone Design Prize 2012

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4 RIWAQ Curry Stone Design Prize 2012

## Key Takeaways

### Cultural Restoration Can Bring Livelihood

A publicity video shows RIWAQ staff training and employing local Palestinians in a craft not previously known to them. By engaging this project and learning its skills, Palestinians can likely find work and livelihood within the region and beyond.

### Palestinians Work to Create Their Own Freedom

Palestinians are looking for ways to establish their own self-sufficiency, agency, and empowerment. At RIWAQ they are fulfilled by working and learning their own heritage and celebrating it on their own terms.

### Community Space is Valuable to a Free Mind

RIWAQ honors its restored spaces by making them available to children and to the community. These efforts tell the community that the Palestinian cultural ethic is to share culture and space, and through sharing there is freedom.

### Iconic and Material Precedents

Much of the readily available imagery showing Palestinian art and culture refers to the Israel-Palestine conflict. This project shows cultural artifacts, icons, materials, and methods that pre-date the conflict, and that have enduring, positive value for the Palestinian people.



**HRMS STUDENTS IN THE GARDEN**



MIDDLE SCHOOL MUSIC & SCIENCE BUILDING

# HOOD RIVER MIDDLE SCHOOL



The Hood River Middle School (HRMS) in north central Oregon boasts a Certified “Net Zero Energy Building” as part of the Living Building Challenge. It is home to the program’s permaculture teaching garden the Middle School Music and Science Building, which harvests its own electricity through photovoltaic panels and provides its own heating and cooling through passive solar and thermal sources available onsite.

I first learned about Michael Becker and the permaculture program at HRMS during a three-week permaculture design course at Bullock’s Permaculture Homestead on Orcas Island in northwestern Washington. Michael spoke to our class about how he blended his passions for teaching and permaculture, bringing them together to strengthen one another. His teaching reinforced his study of permaculture, in that he saw how children were eager for outdoor and nature experiences, and that they longed for tangible understanding of their classroom lessons. Permaculture influenced his teaching practice by insisting that his essential function - giving lessons - be supported by multiple entities. In his case this meant that the classroom as well as the natural world needed to be involved in the act of instruction.



GARDEN HARVEST

Figure 9. Poster for the Hood River Farmers' Market, where Hood River Middle School Students sell their produce


  
[gorgegrow.com](http://gorgegrow.com)

# Hood River FARMERS' MARKET



WE ACCEPT  
FOOD STAMPS,  
WIC & DEBIT  
CARDS

**MAY THRU NOVEMBER 2014**


**THURSDAYS** from **4PM to 7PM**


HOOD RIVER MIDDLE SCHOOL | 1602 MAY ST \* OVER 25 VENDORS

MEAT & EGGS	FRUIT & VEGGIES	BAKED GOODS	HOT FOOD	LIVE MUSIC	KIDS' ACTIVITIES
-------------	-----------------	-------------	----------	------------	------------------

\*20% of the fruit, vegetables, & meat we consumed in the Gorge were purchased direct from a local farmer, we'd keep \$9.6 million in our local economy—FOOD IS AN ECONOMIC DRIVER!


SPONSORS













**MICHAEL BECKER (CENTER)**

Michael has developed curriculum around the teaching garden that reinforces science lessons through botany, biology, horticulture, hydrology, agriculture, soils, and more. The garden helps teachers impart lessons about business - there is a Community Supported Agriculture (CSA) program run by students and teachers onsite at HRMS, who grow and harvest produce from the permaculture garden. Math and geometry have practical application when laying out garden beds, where students need to figure out how much soil and how many starts are needed to plant in the new growing season.

There are lessons for creative writing and poetry, as students can reflect on their experiences with nature. And cycles of beauty and decay offer poetic reference for children learning literature and art.

Becker gives some advice for what the arc of the process might look like when initiating a permaculture teaching garden onsite at a school:

“Not all teachers have background or formal training in these types of activities and at first it can seem like a huge amount of work and a distraction from what we’re supposed to “cover.” As classrooms transfer to a more project-based model, often teachers discover that they actually have more time to work with individual students in a one-on-one scenario because the class has a sense of purpose that keeps them moving forward and allows for a gigantic amount of differentiation. Again, starting with small projects is valuable for future success.”<sup>1</sup>

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1 Clearing Magazine 2010

## Key Takeaways

### Environmental Education Can Include Agriculture

Environmental education need not be limited to outward bound and boy scouts. Much of our outdoor environments include cultivated spaces, and so agricultural education can impart great lessons in understanding natural forces.

### Permaculture Is Viable in a School Setting

Permaculture is often associated with a homestead lifestyle, but it can be applied to smaller systems that engage temporary partners. Schools provide opportunities for garden stewardship as well as proliferation of the permaculture model

### Children Learn From a Garden’s Varied Meanings

Gardens have form, variety, beauty, and function that lend themselves to varied interpretations and scientific lessons.

### Create an Outdoor Educational Ethic

Michael Becker insists that outdoor education does not simply mean that we bring children outside to have recess among vegetation. “Clear expectations of what garden behavior looks like are crucial,” says Becker.<sup>1</sup> A professional attitude toward garden stewardship yields much in learning and the success of the garden.

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1 Clearing Magazine 2010



looking north



looking east



looking south

# SITE CONTEXT + ANALYSIS



looking west

looking north

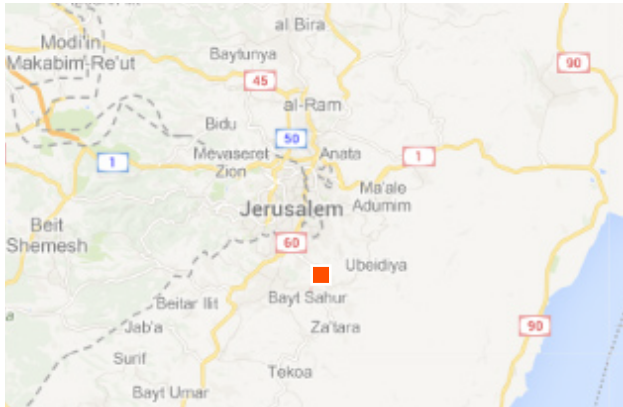
I have conducted site research and analysis both from a distance and onsite. Over the past decade I have visited the site three times, the first time in May 2007. This initial visit left lasting impressions and planted a seed of connection with the site and the people who work and study there. In deciding to design a permaculture landscape for the Holy Child Program, I researched the history, climate, flora, fauna, and people of Beit Sahour, the West Bank, Palestine, and the surrounding region.



International Context (West Bank shown dashed) ■



Site Footprint ■ ■ ■



Regional Context ■



Urban Context ■

1.1 acres



## Methods

During the research and drafting of this thesis I visited the site on two separate occasions. The first was a visit in September 2013, when I spent five days visiting the Holy Child Program, taking photos, interviewing students and teachers, measuring the site, and taking a site inventory.

I visited a second time in March and April 2014, when my husband and I spent ten days onsite working with the school directors, staff, students, and the grounds keeper. We worked together to add one small element to the site: a raised bed with an integrated seating area and overhead shade canopy. We talked informally with teachers, students, and the directors about the landscape, what kinds of landscape assets and infrastructure technologies were already in place and working for them, and what they wanted to see implemented in the coming years. My design recommendations heavily reflect the stated desires of the students, teachers, and directors of the Holy Child Program as expressed during these two visits. The process of designing and building the raised bed was instructive in itself, and informs the implementation plan I have developed for this site.

## Geography

Beit Sahour is located in the Palestinian Territory of the West Bank in the Bethlehem Governate, about 1.5 miles east of the biblical town of Bethlehem City. Beit Sahour sits 2129 feet above sea level, about 45 miles east of the Mediterranean Sea by road, 50 miles southeast of Tel Aviv (Israel's most populous city), and 5 miles southeast of West Jerusalem. Nearby towns include Beit Jala and the refugee camps of Aida, Beit Jibrin (also known as Azzeh), and Deheisheh.

The West Bank is bordered by Jordan to the east, with the Jordan Valley descending quickly across the arid hillside and settling 13 miles to the east of Beit Sahour at the edge of the Dead Sea. The Palestinian West Bank encompasses the western portion of this famously salty body of water, the surface of which is 1,400 feet below sea level.

The landscape is dominated by marine sediments turned to rock, primarily limestone and dolomite. Under these hills of porous stone sit vast aquifers. The abundance of stone makes it one of the most common building material in the region. Where the local stone was historically used for structural construction, most buildings are now made of concrete and use stone as a veneer.

## Politics

The Holy Child Program is located within the Palestinian territory of the West Bank. The West Bank is divided into three types of political and legal jurisdiction. Areas A, B, and C have been delineated by the Israeli government, and refer to land that is either (A) under Full Palestinian Civil and Security Control, (B) under Full Palestinian Civil Control and Joint Israel-Palestinian Security Control, and (C) under Full Israeli Control Over Security, Planning, and Construction (Figure 22). It is estimated that 61% of the West Bank is classified as Area C.<sup>1</sup> More than half of the Palestinian West Bank is not planned or developed by Palestinian entities, but rather by the Israeli government.

<sup>1</sup> World Bank 2014

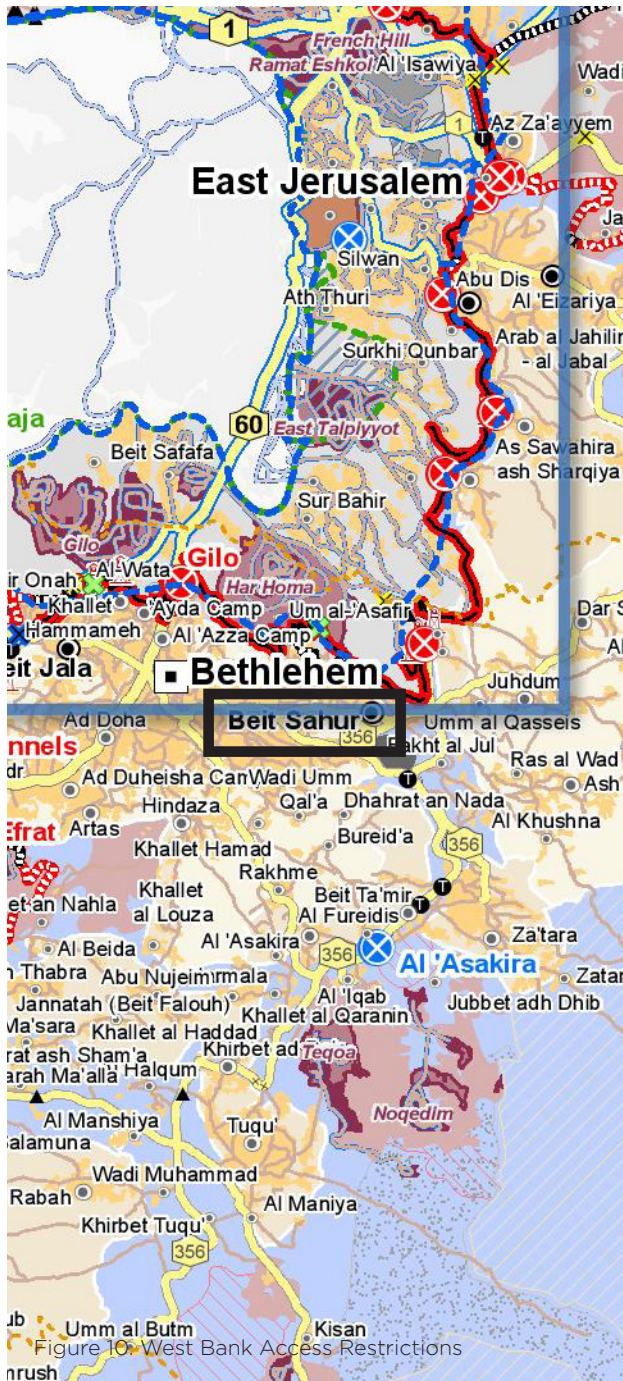
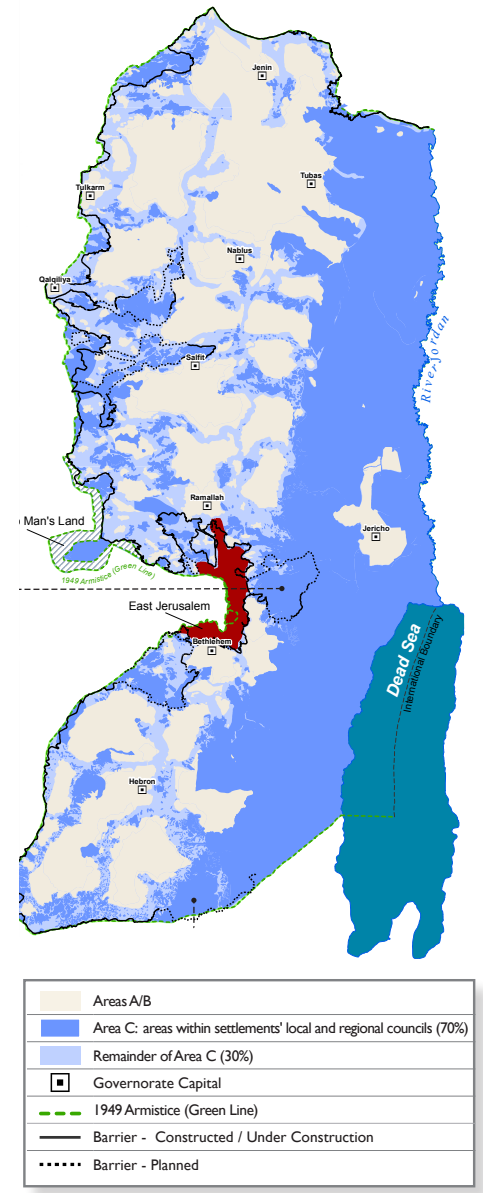
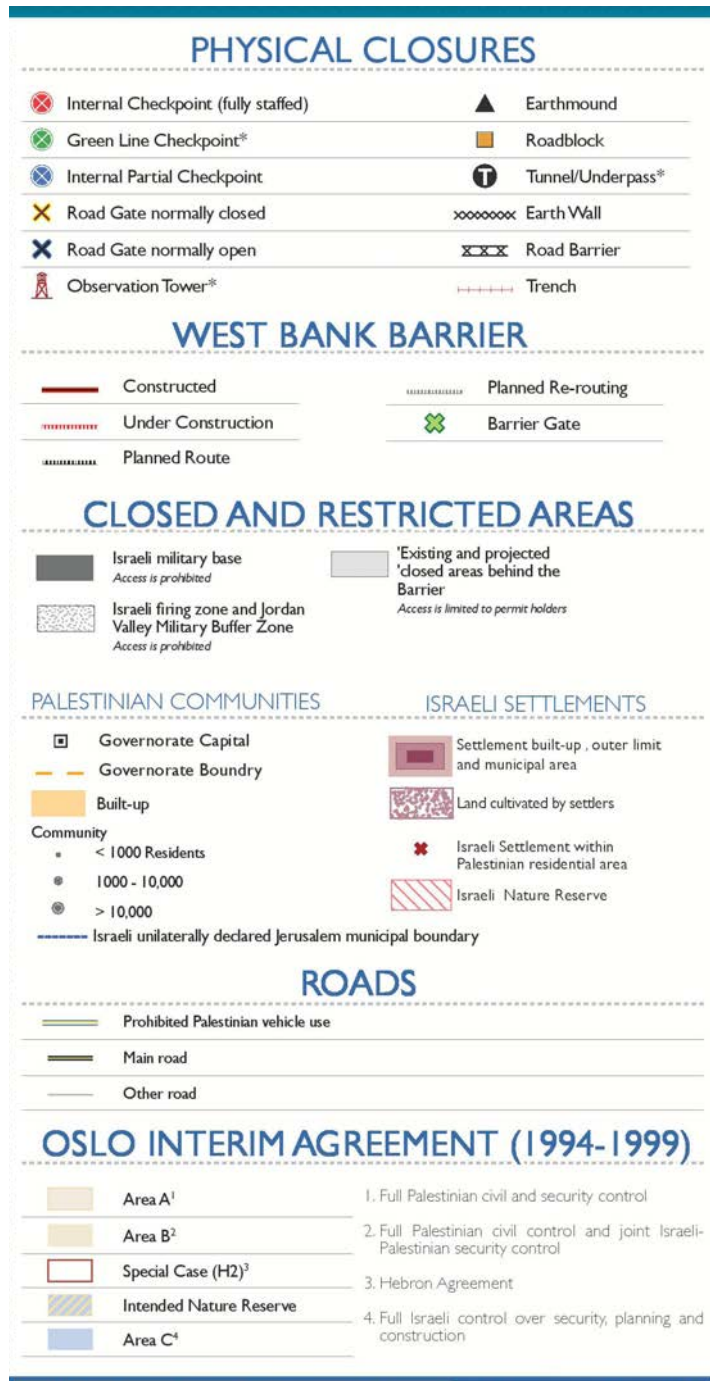


Figure 10. West Bank Access Restrictions



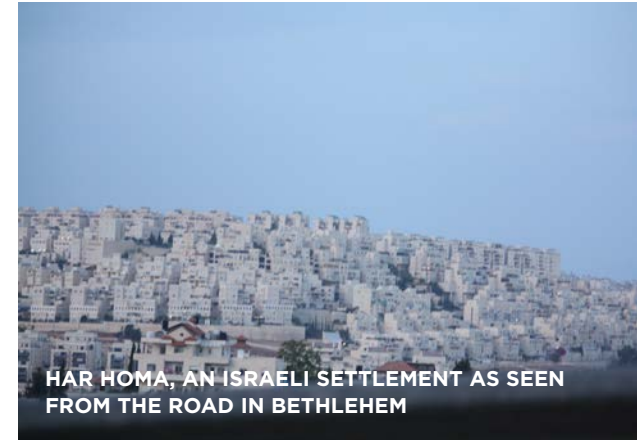


Access to the West Bank from Israel is currently controlled by Israel's military and police force. Beit Sahour is a fifteen-minute drive from West Jerusalem (Israel's holy city), but is accessed only by passing through an Israeli military-controlled checkpoint. Travel between the two towns can take more than an hour, particularly for Palestinians who make the trip. Palestinian residents of Beit Sahour and other West Bank towns are required to obtain permission to move across Israeli checkpoints, which is granted to relatively few Palestinians.

Even with permission, Palestinians are often stopped and questioned as they attempt to pass through. Many are required to get out of their cars and walk through long fenced corridors while their vehicles are searched (above). There are stories of Palestinians being strip searched as they make the crossing, forced to remove all clothes out in the open, visible to others waiting in line.<sup>2</sup>

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2 Hass 2012



Israeli citizens are not legally allowed to enter Palestinian-controlled areas of the West Bank without permission from the Israeli government. However, there are territories within the West Bank where Israelis live. Those are the Israeli settlements (above) that are the subject of much of the political discord between Israel and Palestine. It is estimated that 300,000 - 500,000 Israeli citizens live in Israeli settlements scattered throughout the West Bank, oftentimes on land confiscated from Palestinians by the Israeli military.<sup>3</sup> Palestinian homes and entire communities have been destroyed across Palestine in order to make room for roads and new Israeli developments.<sup>4</sup> Settlements are heavily protected with electric fences and armed guards at their gates. Settlements continue to be constructed despite international calls for a moratorium.

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3 Gorenberg 2009.

4 RIWAQ 2012

## Beit Sahour, West Bank, Palestine

(Bayt Sahour, Beit Sahour)  
the house (Beit) of vigilance (Sahour)



**Beit Sahour Established**  
**1952**



**Land Area**  
**8,306 dunams**  
[3.2 sq.mi., 830 ha]



**2012 Population**  
**12,367**  
**2,676,740**



**Unemployment**  
**17%**  
**21%**



**Elevation**  
**+649m**  
[2,130']



**Annual Rainfall**  
**454mm**  
[18"]



**Average Temp**  
**5° C / 30° C**  
[41° F / 86° F ]



**Project Area**  
**4,417m<sup>2</sup>**  
[1.1 acres, 0.44 ha]



“The origins of the name Beit Sahour reputedly stem from the Canaanite words ‘Beit’ meaning place, and ‘Sahour’ meaning night watch, which reflected the importance of the area for shepherds. The land provided their flocks with good grazing during the day and safety in the numerous caves at night.”

Beit Sahour’s city council was given status of a municipality. The city council had been formed 27 years earlier, when it held its first elections.

Land ownership and development rights are highly political issues in the West Bank. Israel has classified three types of land there, Areas A, B, and C. Area A is controlled by the Palestinian Authority, Area B is jointly controlled, and Area C is fully controlled by Israel. More than 60% of the West Bank is classified as Area C.

Approximately 341,400 Israeli settlers live in the West Bank

The West Bank has a youth unemployment rate of 35%.

Beit Sahour is nestled in the Judean Mountains of eastern Israel / Palestine.

The West Bank goes long stretches with very little rainfall. May through September can see fewer than 5mm of rain.

Beit Sahour: 60% average annual humidity

1 dunam is 1000 square meters  
roughly equal to .25 acres

### Demographics

The town of Beit Sahour is home to roughly 13,000 residents, comprised of about 3,000 households. 30% of the population is below the age of 15, and 60% are between the ages of 15 and 64. Only 1000 or so Beit Sahour residents are 65 or older. These figures point to high fertility rates and comparatively low life expectancy, which is 75.5, roughly 5 years less than Israel, the U.S., and many European countries. Another factor is the prevalence of emigration from the West Bank, which sees large numbers of college- and graduate-level students, primarily men, leaving the region to seek more robust educational and job opportunities abroad.<sup>5</sup>

5 ARIJ 2010

Figure 11. Beit Sahour & West Bank Site Data



VEGETATION, TOPOGRAPHY, & ARCHITECTURE TYPICAL OF BEIT SAHOUR

### HCP Management

The Holy Child Program is operated by an American social worker who serves as President of the Board of Directors and a Palestinian therapist who is Director of the school. All seven of the teachers are Palestinian nationals. All but one of the teachers are Christian. The exception is a Sunni Muslim from Jordan. The school nurse is of Swiss origin and married into a Palestinian family, and now calls the West Bank her home.

The Holy Child Program operates on two pieces of property that are owned by separate Palestinian Christian families who live in the United States. The owners are interested in selling the property to the school's board of directors, but so far the board has not been able to raise the funds. Together the properties are priced at around 500,000 USD. The board of directors rents the buildings from the owners and have made several strategic improvements to the landscape and buildings over the fourteen years of their residence there.

### Climate

Beit Sahour and its region are characterized by an arid/semi-arid climate that is known for dry, hot summers and cool winters with precipitation. Temperatures reach an average high of 88°F July through September and average low of 38°F in December and January. Summer temperatures have reached over 105°F, and winter temperatures 18°F.

There is some rain in Beit Sahour, but only for about half the year. June through September are dry months, entirely without precipitation. Rain begins again in October, with small amounts (about 0.7"), and peak in January and February with over 3" per month, and decline again in May with as little as 0.3" of rain. Even during the rainy months of January and February, precipitation occurs less than half the days of the month, and occurs on only two or three days in each May and October. A typical year will see 1 – 3 days of snow.

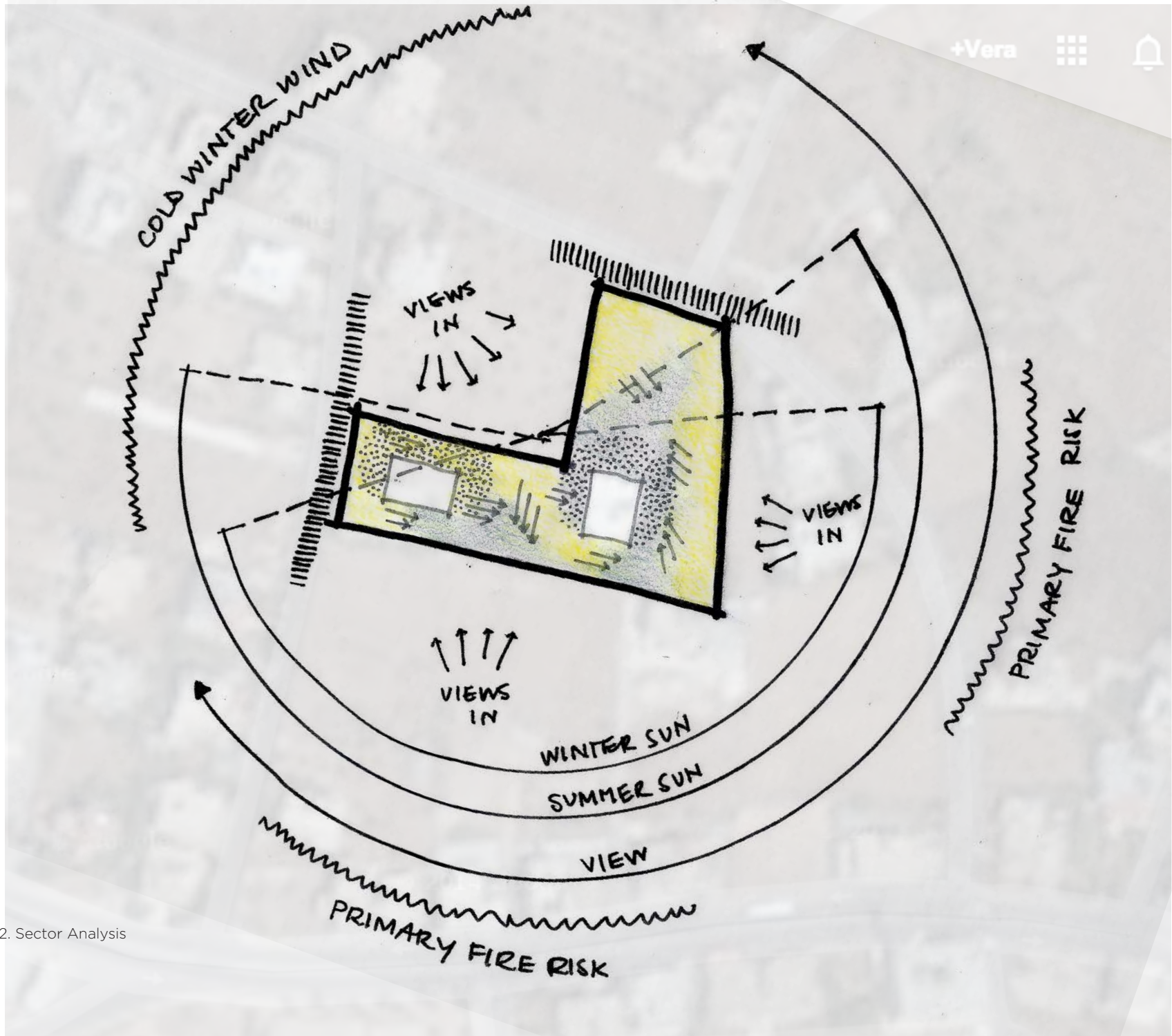


Figure 12. Sector Analysis

## Water

The small amount of precipitation in this region contributes to increasing prevalence of water shortages. With the rapid growth of the Israeli population over the past seventy five years, water demand has far exceeded this semi-arid region's capacity to adequately hydrate both the people and their landscapes.<sup>6</sup> Israel and its citizens are granted priority access to water supplies, with Palestinian communities experiencing shortages, as wells and storage cisterns run dry. Few Palestinian landscapes are adequately watered, although there is room for improving landscape practice to increase irrigation efficiency, as is true in much of the rest of the world.

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6 DellaPergola 2014

## Wind

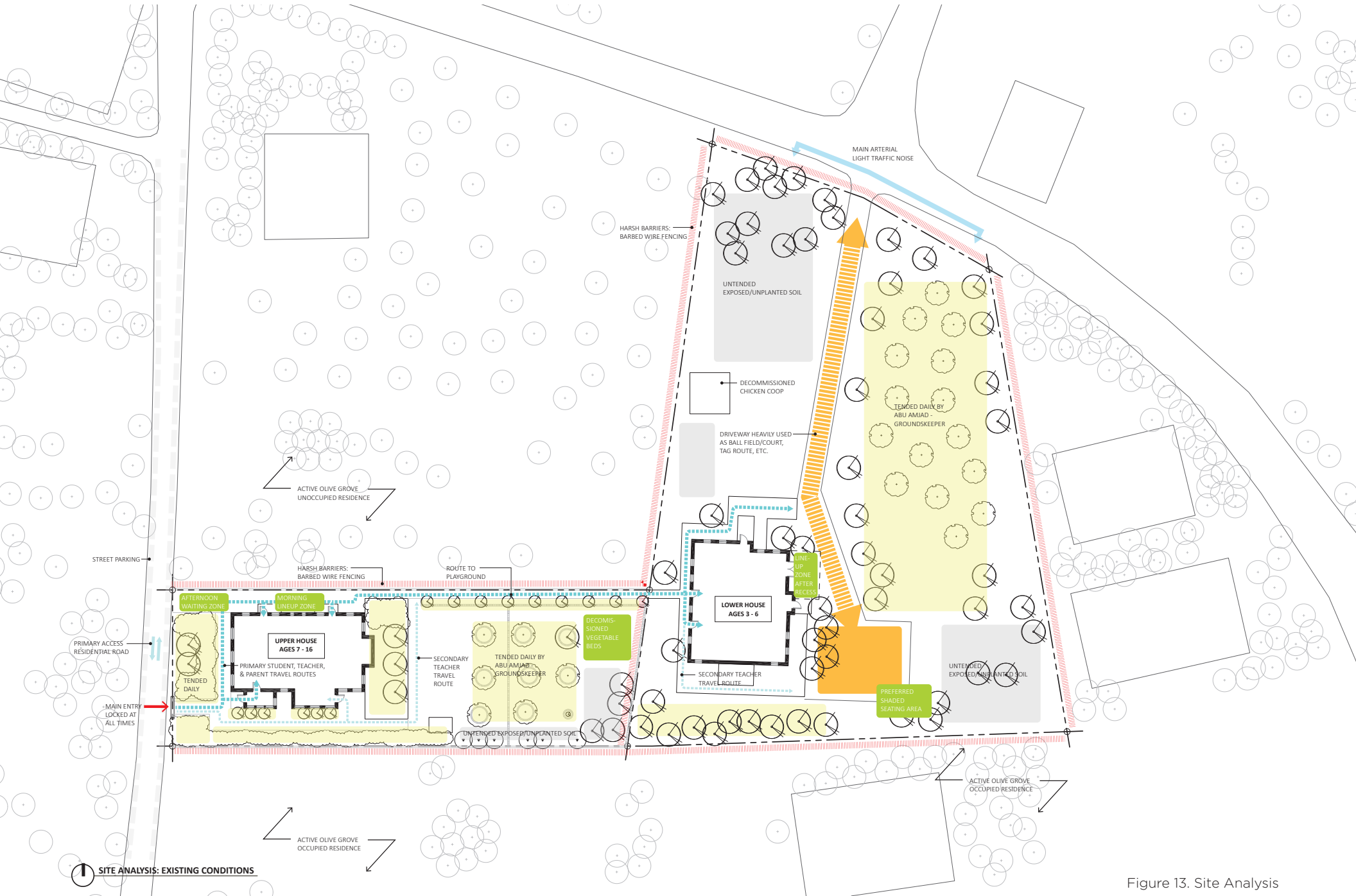
Prevailing wind comes from the north and northwest, hailing from the Mediterranean sea to the west. There is a consistent light breeze of about 6 miles per hour in fall and winter (October – January) with winds picking up to 9 or 10 mph in the summer months (June – August), speeds that I experienced while onsite in both September 2013 and March/April 2014. Flags were extended by the wind, trees rustled, and outdoor canopies billowed. The remaining four months see consistent but comfortable 8 mph winds. Throughout the year the wind has been recorded at much higher speeds, with records set in March at over 40 mph, which according to the Beaufort scale is considered a gale, creating conditions where it might be “difficult to walk against wind. Twigs and small branches [may be] blown off trees.”<sup>7</sup> During the 2014 visit there were regular references made to the potential for wind to strain the fasteners used to secure an outdoor canopy. Wind is something to consider when designing outdoor structures, but is not commonly damaging.

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7 UNC 2001

## Sun

The HCP site spans across two parcels of land. The easternmost parcel is oriented east-west, with sun exposure across its length. In warmer months – April – October – the upper lot is warmest just east of the school building among the olive grove, which benefits from the exposure. The lower lot is oriented north-south, with the hottest midday sun hitting the south face of the building and warm afternoon sun shining on the western face. Teachers and children alike describe many of the spring and fall days as being too hot to linger outside. Shade is provided mainly by the buildings, with few trees of any size providing adequate relief from the sun.



**SITE ANALYSIS: EXISTING CONDITIONS**

Figure 13. Site Analysis

### **Holy Child Program Site**

I conducted analysis of the physical influences on the site, which include forces of nature, such as wind, sun, and precipitation; forces of human will, such as circulation and degree of use of existing elements; and an inventory of the elements that were built, planted, or volunteered their presence there at little known points in recent history.

Starting at the entrance, which is along the west edge of the Upper House, families and children arrive at the school along this recently re-paved residential road. Many children arrive in a neighborhood van or bus, others are dropped off by their parents, and another significant contingent arrive by taxi. There are some that walk from where a regional bus drops them in Beit Sahour. Arrival by taxi is not as costly as it might seem - the cost is much lower and oftentimes families will make arrangements with taxi drivers in their communities, and barter for the service of having their children driven to school.

There are two entrances along the western edge. One is a gate with a posts and a lintel frame – a trabeated system much like Stonehenge – with integrated aluminum fencing throughout. This gate remains locked throughout the day, and a there is a doorbell that students and families use to notify the front desk that they would like to be let in. This entrance is visible from the reception desk. The second entrance is a driveway and is rarely used. It is accessed by opening a large iron gate, and is used for deliveries and sometimes for parking vans or buses inside the perimeter of the property.

### **Circulation**

Upon entry through the primary, pedestrian gate, students move one of two directions: 1) into the building through the front door, through an entry vestibule, and then into the front office; 2) to the left (north) and across the west edge of the building, toward the driveway. It depends on the time of day of arrival, the age of the student, and where she is supposed to begin the day. Many students begin the day playing and hanging out in the driveway. The car gate there is secure and the area contains the students easily. When the day is ready to begin, students line up outside the north doors, which lead into the community room, and then into four

classrooms and an administrative office.

Crossing the threshold from the road into the confines of the school property is a joyous act for many students, who describe the school as their oasis, a place where they feel safe and welcome. There are clearly understood places for play and places where children are not invited to dwell. Although it is not immediately clear to a visitor, if we follow the path of the children it is apparent that they have an unambiguous understanding of where they should and should not go.

My observations during three site visits show that the space is clearly delineated into areas of heavy use by everyone, areas of light use by teachers and staff, and more distant spaces used primarily by the groundskeeper and school director. They are the two primary site caretakers, as far as what happens with the systems and with the yard. The women work inside, at the end of each day they mop the floors, clean the bathrooms, clean the kitchen, and other housekeeping chores. Gender roles are rather traditionally distinct; the women tend to upkeep of the interior of the buildings, and the men maintain the site's infrastructure, including water and electric systems.

The architecture reinforces these zones of activity, with a number of corridors and rectangular gathering areas, many of which are delineated with a fence, a gate, walls (low and high), and changes in grade. The western portion of the upper house is highly hardscaped, with polished stone pavers, chiseled stone seat walls, and polished stone seat caps. The materials and construction are typical of olive grove estate buildings in the area.

Once the day begins, students move into the classrooms of the upper house or they are guided by teachers down to the classrooms of the lower house. Throughout the day there are periods during which they are escorted from the upper and lower house classrooms down to the play area east of the lower house. The walkway between the upper and lower houses is heavily used. The walled area has little in the way of buffer from the sun and wind, and its lack of vegetation or surface treatments create a space that often heats up rather quickly in warmer months.

Outside of this main corridor the children are rarely present, and the staff and teachers instead occupy these spaces. Teachers access different parts of the site by walking along the southern edge of the upper house, and will move around the lower house along the southern edge as well. These areas tend to have more vegetation and are less manicured, providing a more private circulatory system for those who wish to move about without distracting instruction or activities that take place throughout the day. The grounds keeper and the school director both make regular use of many areas of the site, as they work together to plan and implement site maintenance projects.

Students begin their days lined up at the north court, and file into their respective classrooms. Classrooms are roughly organized by age, but there is a relatively large spread of ages within them, with some children as young as eight sharing a class with students as old as fourteen.

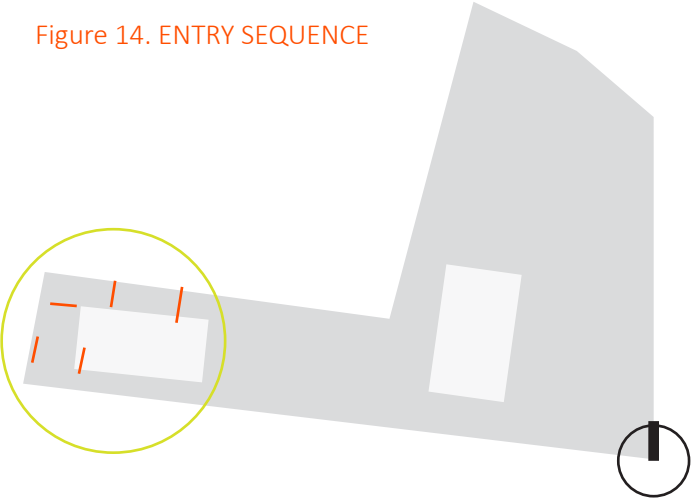
Overall, about a quarter of their days are spent engaged in structured, communal activity, another quarter playing outside, and the remaining half in the classroom hearing lessons and engaged in school work. Communal activity includes time spent gathered in the community room for songs, presentations, and cultural activities. They also spend time there reinforcing their classroom lessons with the Incredible Years.

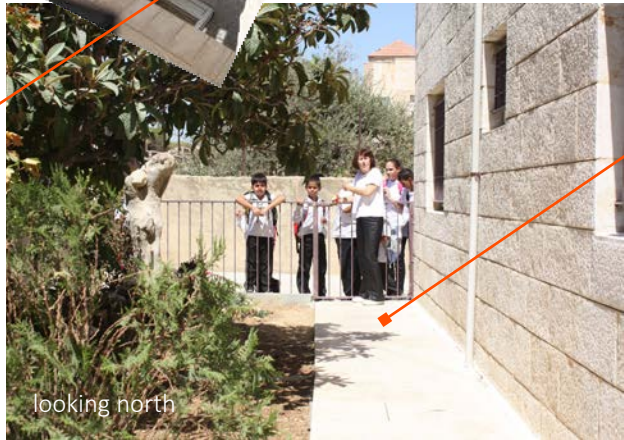
At the end of the day the children gather again in the driveway and wait to be picked up. As each pickup arrives, two staff are on hand to direct the children out of the site and into the proper vehicle. There is limited freedom for many of the children to move from the driveway to the street by themselves. Permission to do so is commensurate with their ages and levels of cognition – the youngest children are guided individually and the oldest children are typically free to move on their own.

With all of this information in hand, I generated a zone layout. The zone layout tells us about zones of use, from most actively used and visited spaces to least actively used spaces. The zone layout is where the permaculture designer decides which uses go in which zones, based on current and desired use of spaces onsite.

I also conducted an edge assessment, which illustrates where active uses abut passive uses, and all combinations in between. Combining the edge and zone analysis shows us that there are dynamic centers of activity and some potential for conflicting or catalytic uses. This will be further examined in the Design Process section.

Figure 14. ENTRY SEQUENCE





looking north



looking west



looking west

Figure 15. UPPER LOT NORTH

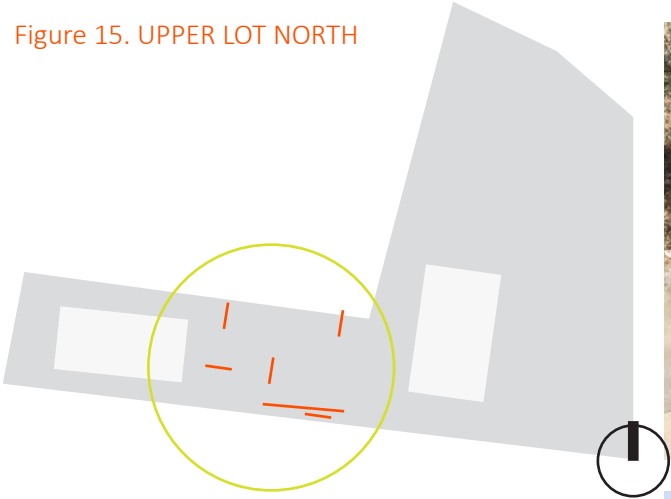
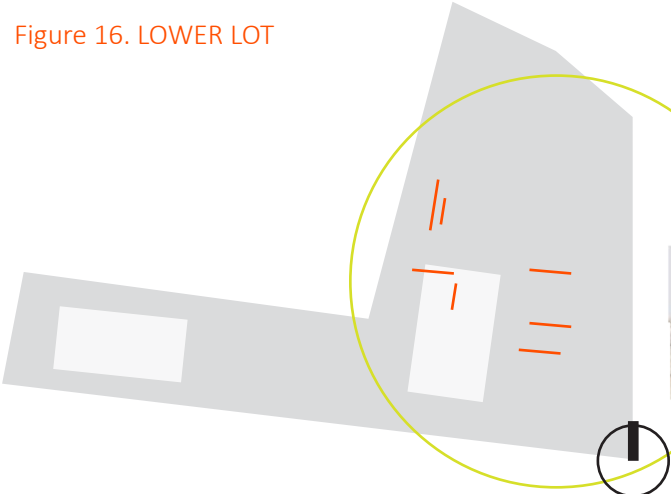
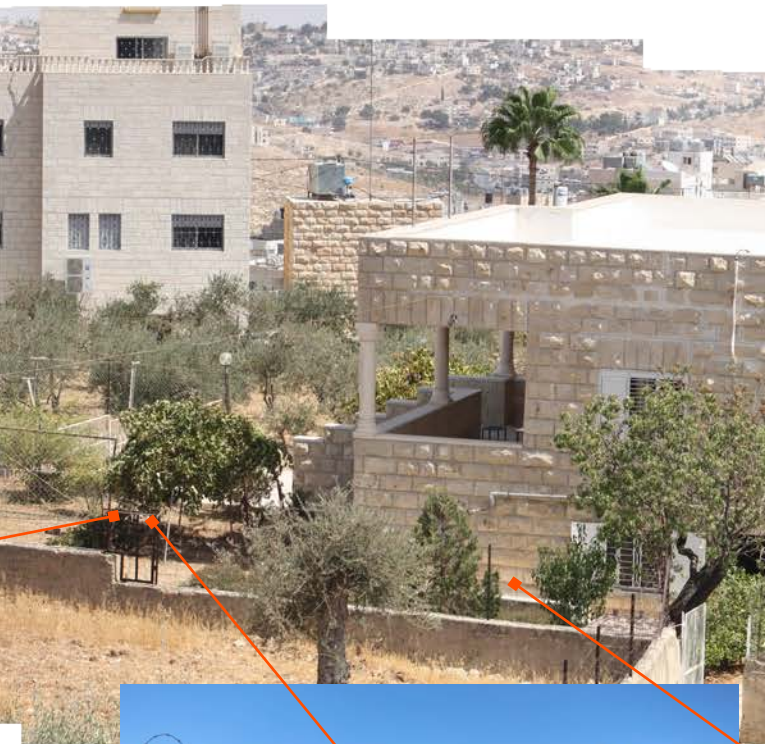




Figure 16. LOWER LOT





play driveway



swingset



looking northwest



rainwater storage vault



Figure 17. Site Zones

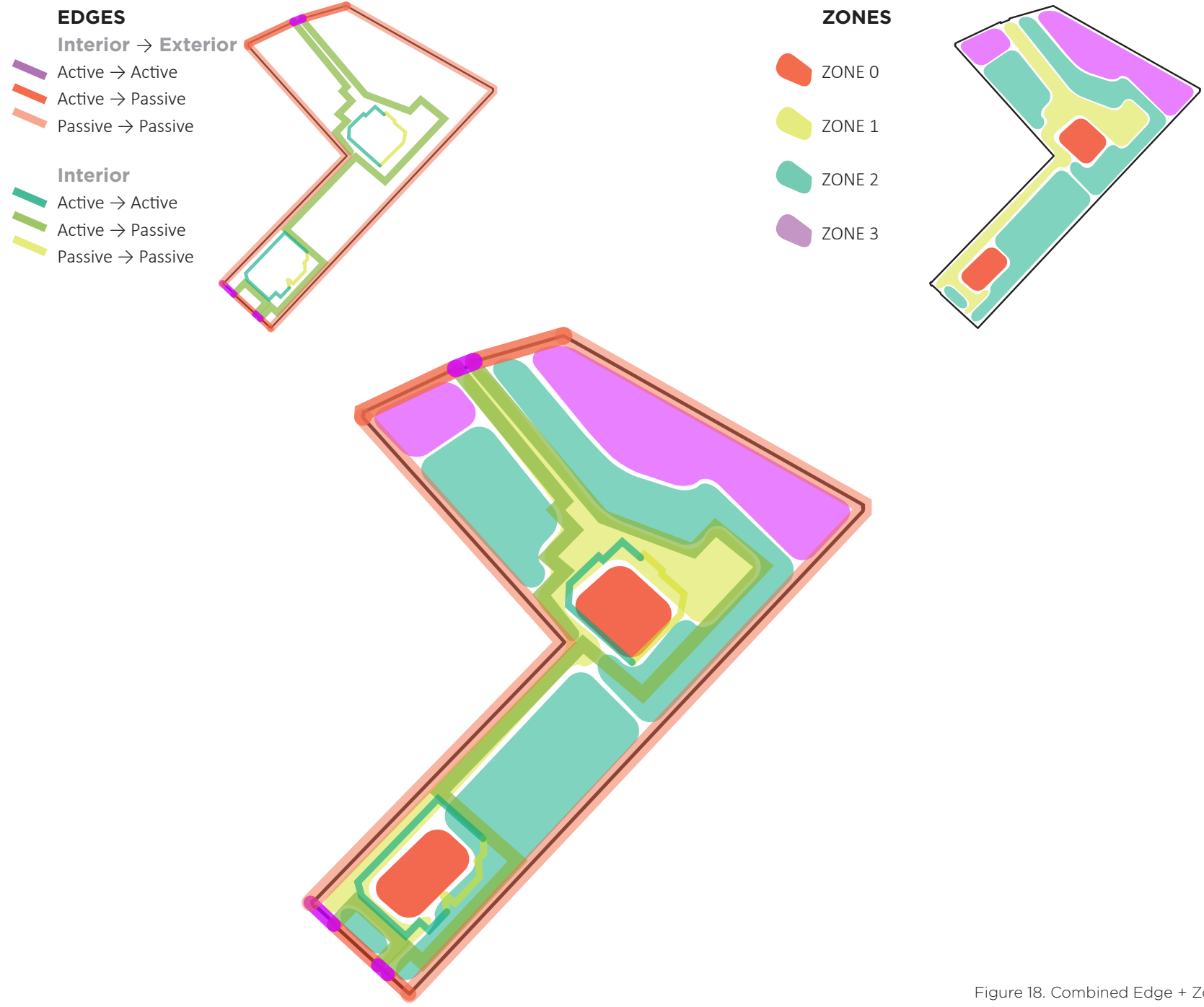


Figure 18. Combined Edge + Zone Analysis



VIEW OF SITE FROM THE EAST

# DESIGN APPROACH

The wealth of information so far discussed in this narrative has informed a multi-stage strategy for both designing and implementing a healing, therapeutic, educational, playful, and productive landscape onsite at the Holy Child Program.

In accordance with the Permaculture design model, I will deploy a suite of strategies that begins with a needs and yields analysis. A needs and yields analysis is an examination of a site that requires the identification of environmental and human needs on the site, as well as benefits or materials that the site and its elements provide (i.e. yields). With both lists in hand, needs and yields are together examined to assess whether or not existing yields have untapped potential to meet unresolved needs.

Figure 19. Thesis Design Process

## THESIS DESIGN PROCESS



- CONDUCT SITE RESEARCH
- REVIEW LITERATURE
- CONSIDER CASE STUDIES
- SITE + SECTOR + ZONE ANALYSIS
- NEEDS + YIELDS ANALYSIS
- DERIVE SITE ELEMENTS
- LAYERING (SITE ANALYSIS + ELEMENTS + ZONES)
- ITERATE
- DEVELOP 3 SCHEMATIC OPTIONS
- IDENTIFY PREFERRED ALTERNATIVE

REPEAT ONSITE WITH HOLY CHILD PROGRAM COMMUNITY

IMPLEMENT PHASE 1

OBSERVE + ITERATE

IMPLEMENT PHASE 2

OBSERVE + ITERATE

IMPLEMENT PHASE 3

### Design Process on for This Thesis

Stepping back a bit, we look at where we are in the larger scheme of this project, and understand where the needs and yields analysis fits within the larger sequence [Figure 19]. My work began with site research, which helped me to decide on topics to review within the existing body of literature. I then looked to case studies, which demonstrate how the literature has already been interpreted or manifest, knowingly or not, on existing sites, and which bring forth additional lessons not found in the literature.

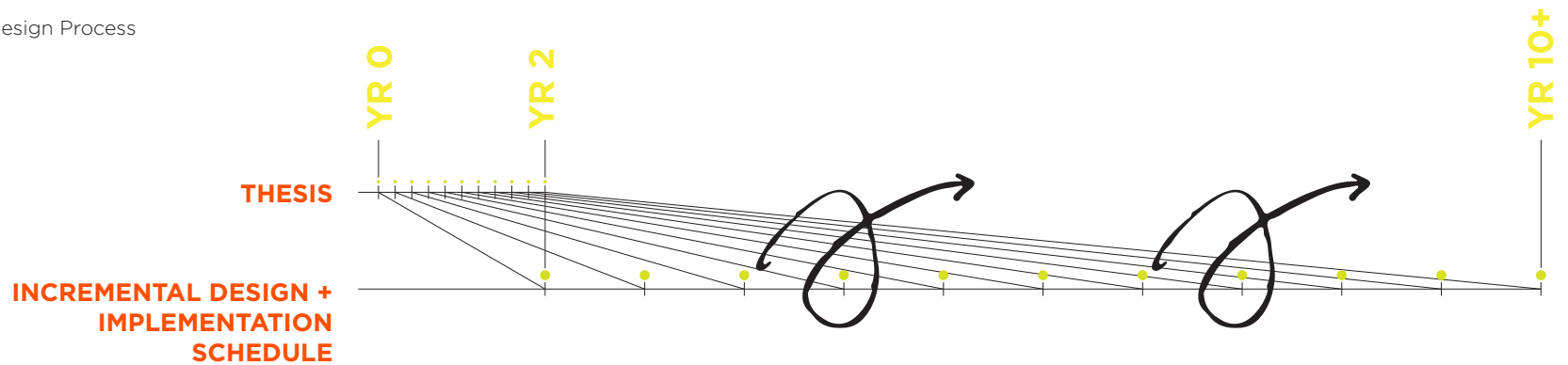
I then focused on this site specifically, analyzing movement, vegetation, uses, people, weather, and more. I conducted a sector analysis, looking at sun, wind, and other powerful environmental forces. Through site observations and conversations with HCP staff and students, I derived the zone layout, which tells us how the site currently functions given the available infrastructure. Since the major infrastructure of the site will not change with this design (buildings, paths, site walls), I am showing the zones maintained as they are, building on existing use patterns.

It is now time to conduct the needs and yields analysis, so that we can discern where the efficiencies of our system lie: which elements lie dormant and can be called into action; which technologies exist in the world that are readily available that could catalyze this site into a new realm of sustainability and cost savings; which elements would make this site even more delightful, instructive, healing, and playful.

The needs and yields analysis performed in this stage generates a list of plausible site elements. With that list in hand, I will combine analyses (site, sector, and zone) as layers that, when combined, provide a depth of information about each zone, and how each one is best suited to receive new and modified site elements and functions. I will then use that overlap of information to play with different arrangements of elements on the site.

Through iteration I will develop several design alternatives that each maximize efficiency of site elements in slightly different ways, both in terms of the function of elements and the design language used. The design language refers to the form used to lay out the elements - are paths and edges curvilinear? Orthogonal?

Figure 20. Incremental Design Process



Jagged? or some combination of those? Regardless of the form, each alternative will meet all of the essential needs put forth in the needs and yields analysis. These alternatives will provide options for the HCP to consider, and together we will decide on the best of them as a plan for moving forward.

### **Design Process in Real Time**

Permaculture is a time intensive and iterative process that requires years of design and iteration, which means that I cannot conduct a true Permaculture design and implementation process within the time constraints of researching and writing this thesis. That window is two years at the most, whereas working onsite with the students, family, and teachers at HCP will take a decade or more, particularly because my presence onsite will be so brief and sporadic. Most of the work and observations of its functionality will happen in between, after each phase is installed and the community has time to live with and reflect on each new stage of functionality.

For these reasons, this thesis serves primarily as a model for what the design process will look like when it comes time to work directly with the HCP community. In this chapter, I review the stages, to hash them out

and to develop some early insights. I will then propose this process to the HCP community, get their input, and modify as needed. This document lays out milestones and critical exercises along the way, so that together we can see where to start and where we might end up. We will take this document, which hopefully has some words and images and technologies that stoke the imagination and inspire a new vision for the HCP community, and we will begin its steps from the start, stretching out the two-year thesis design process across the length of a decade or more [Figure 20].

Some steps will inevitably contract - perhaps the HCP community and I will not review the literature together, but will rather draw on local expertise that will be more readily available onsite. The layering and design iteration stages may be fast as well. My visits are short and so quick design charrettes may be the best approach for gathering rich and expedient information about how best to meet everyone's needs onsite. Other stages will expand, such as the installation, observation, and iteration stages, which will occur over the course of months and years. Such is the nature of the small, slow, iterative permaculture design process.

### **Design Outcomes of this Thesis**

For this thesis I developed the three design alternatives to the schematic level only. I will then decide on one schematic as the preferred alternative. This one schematic may be one of the three or a some combination of attributes from the three proposed. This process allows me to provide images of a feasible future. I will propose plans and details that are intended to inspire the HCP community and evoke ideas about what could be, but not what must be. The final design alternative is in no way a finished project or end point. Instead, it will represent a starting place for conversation and engagement.

The design shown here will demonstrate to the Holy Child Program community the potential outcome of a process that I hope to undertake with them over the course of the next decade, as we work together to develop their site. The proposed design will act as a catalyst, providing something to look at and critique, and therefore evoke better and more informed ideas about what should be, and what will meet the needs of all those who engage this site. We can use this work to project forward the real-life process that we plan to undertake together.

### **Needs + Yields Analysis**

Much of the efficiency of the Permaculture design approach is embedded in the Needs and Yields Analysis. We begin with what we have, and we work to maximize its utility in performing essential functions. With nearly every permaculture design process there are many existing site assets that have unrealized potential to meet site needs. Our needs and yields analysis will reveal those latent functions.

There are, however, scenarios where we need to introduce additional site elements:

(1) The first scenario is the case where one of the site's essential functions is not operational because there is not the right asset (or combination of assets) to meet this need. In this case we will need to identify a new element to bring onto the site so that it serves this essential function.

A real-world example of the first scenario as it pertains to the Holy Child Program is the site's essential need for money. Right now the site is not funded to the point where it can pay for all of the services it needs to operate. There is a functional deficiency here. Knowing this, we

need to introduce site elements that meet the need for money, both through efficiencies that allow for saving money and through elements or activities that increase revenue to the site.

(2) The second scenario is the case where an essential function is operational, but that this need is only being provided by one type of site element. According to Permaculture's 3 Principles of Efficiency, each essential function must be served by multiple elements, so that there is functional redundancy in the system. If functional redundancy is not achieved for each essential function, we need to introduce new elements so as to achieve it.

An example of this second scenario is the Holy Child Program's need for energy. The site's buildings need energy so that there is electricity indoors to light the building, power computers and other electronics, and more. Currently there is only one power supply, the town's electric grid. The fact that only one element meets the needs for this essential function tells us that additional elements need to be brought into the function of providing electricity, either by deploying existing assets with this potential capability, or by introducing

### Table 3. Maslow's Hierarchy of Needs

#### Foundational Layer (Layer 1): Physiological

Breathing  
Food  
Water  
Sex  
Sleep  
Homeostasis  
Excretion

#### Layer 2: Safety

Security of Body  
Employment  
Resources  
Morality  
Family  
Health  
Property

#### Layer 3: Love/Belonging

Friendship  
Family  
Sexual Intimacy

#### Layer 4: Esteem

Self-Esteem  
Confidence  
Achievement  
Respect of Others  
Respect by Others

#### Layer 5: Self-Actualization

Morality  
Creativity  
Spontaneity  
Problem Solving  
Lack of Prejudice  
Acceptance of Facts

### Key

Met

Partially met, would benefit from intervention

Not met, needs intervention

Intangible, outcomes are subjective

Outside the scope of this project

new ones. Despite the fact that there is no shortage of electricity serving the building, the source is singular, and so permaculture demands that we identify additional sources of power for this site, bring them into function, and bring functional resilience to the site.

### Needs

Many site needs have already been broadly identified by directors of the school, and they include education, healing, and play, as examples. These needs are those aspects of the HCP mission statement that tell us what services the HCP provides. Other programmatic needs are not so readily identified, but emerge through analysis as those that indirectly support the larger mission of the program. For example the teachers and staff may not identify water and food as site needs - they go without saying. But the school cannot function without them, and so this example tells us that we need to look for needs that exist beyond those stated.

In order to reveal these basic, underlying needs, I looked to Maslow's hierarchy to capture all possible needs, including those already met onsite and those that merit attention [Table 3]. Although Maslow's focus,

as a psychologist, was on individual needs, this well-established articulation of needs can also be applied at the community and site level. In the context of this thesis, needs refer to needs of the people as well as needs of the site's vital systems, such as plumbing, structural stability, and electricity.

As expected, most of Maslow's foundational layer of needs are already being met, at least partially, onsite. Were they not, the school likely could not function. However, many other needs are only partially met because these systems do not satisfy permaculture's requirements for functional redundancy. We may have water onsite, but is it provided by multiple elements? Water is delivered to the school at regular intervals, and sometimes there is rainwater stored in the underground cistern, but still the need for water is only partially met. Security of these sources is fragile. Water regularly runs out toward the end of the school day. Therefore this partially met need would greatly benefit from interventions that work to secure the main source as well as creating redundant sources. Without intervention, functional redundancy does not exist with this system need. Permaculture's three efficiencies tell us that each

#### Table 4. Site Goals for Maslow's Needs

##### Food

Provide meals to students as needed: breakfast, lunch, and snacks (particularly when families cannot)  
Food provided is healthful - emphasis on fruits, vegetables, and protein, with some treats

##### Water

64 oz. potable per day, per person  
Irrigation for all essential landscape plantings  
Water sufficient for cleaning the self, the built environment, and for carrying away human excrement.

need shall be met by multiple elements. Few of the site's foundational needs are met by more than one element. And so these needs are only partially met, and demand intervention.

It is a profound task to consider all of Maslow's needs, assess how they are met, and find ways of meeting those needs as yet unsatisfied. To begin the process, I have categorized each need as either (a) **met**, (b) **partially met but would benefit from intervention**, (c) **not met and so needs intervention**, (d) **intangible, outcomes are subjective**, or (e) **falls outside the scope of this project**.

The only need that is fully met onsite is the need for breathing. Were this not met, we would not be able to begin any design process at all. Even knowing this, it should be clear that Met needs must be maintained as these site interventions unfold, and so they will continue to hold a place on the list so as to ensure they are not overlooked.

Needs that are partially met are those ripe for intervention, where the bulk of our physical engagement with the site will take place. Addressing these tangible needs, by engaging in physical acts that we can identify,

##### Excretion

To be to be transformed into a resource

##### Security of Body

Absence of clearly harmful elements  
Educate how to avoid harmful elements and treat injury  
Cultivate good decision-making skills

##### Employment

Reliable for staff - no fear of layoff  
Available to students - opportunities for paid work  
Available to the community

act on, see, and watch take hold over time - these needs whose solutions can be observed with the senses - this is where we physically engage the site. Maslow's physiological and safety needs are those we actively work to meet, as they are actionable. These are the needs that can be visibly, tangibly, and quantifiably met through engagement with natural cycles, processes, and properties. Meeting these needs comes about through collaboration and contact with the natural world. The assertion of this thesis is that these acts of engaging healthfully in the landscape to meet physiological and safety needs will ultimately meet our intangible needs.

There are also needs that lie outside of the scope of the project. They are those that either it is not appropriate for this site to address (such as the physiological need for sex or the security of family). These needs will not be addressed here, but their solutions may be extrapolated by those involved and near to this site and its progress. With our needs identified, we can look at specific goals for meeting those needs. Food is a need that is partially met but could benefit from intervention. It is important to know how much food, and for whom, so that the size of the intervention is appropriate to the need [Table 4].

##### Resources

Money - make reliable and sufficient to pay salaries  
Raw materials - make available for cottage industries

##### Health

Physical and mental health actively promoted onsite daily  
Unhealthy elements neutralized or removed

##### Property

Secured through purchase of land & buildings  
Protected through healthful community relationships

In addition to Maslow's needs are those needs identified by the staff, directors, students, families, and community members of the Holy Child Program [Table 5]. These needs include enhanced opportunity for play, for respite, for energy, nourishment, and livelihood. Through conversation with some of these stakeholders I have developed a list of desired improvements to the site, and will continue to build on it as future phases of this project unfold beyond this thesis process. The recommendations of this thesis reflect these stated needs with great emphasis. But surely there are more to come.

Finally, I looked to the needs identified in the Literature Review. These are the needs that emerge from our desire to create an evidence-based design for a site that is healing, playful, therapeutic, productive, and educational [Tables 6 - 8]. These needs include sensory stimuli, shade, enclosure, and wayfinding, to name a few. These are the needs, that when met, will make this site more healing, playful, educational, and productive.

#### **Table 4. (cont'd) Friendship**

Healthful social interaction apparent onsite  
Friendships apparent between peer groups  
Intergenerational friendships apparent onsite  
Friendship activity apparent within the community,  
through community work parties and during weekend  
play

#### **Table 5. Needs Expressed by HCP Students, Teachers, and Staff**

Meditation Area  
Flower Beds  
Vegetable Garden  
Irrigation System  
Additional Water Sources  
New Sewer Line  
Remove Septic Tank  
Solar Panels  
Underground Parking Garage  
Greywater Harvest & Treatment System  
Play Equipment  
Outdoor Seating, Tables, and Overhead Cover

#### **Table 6. Needs Broadly Identified in the Literature**

- Sensory stimuli
- Facilitated physical and psychological movement
- Areas for both safe seclusion and social interaction
- Educational activities
- Educational spaces
- Play structures
- Passive Play
- Active Play
- Variety
- Legibility

#### **Table 7. Required General Considerations from the Literature**

*Required Features & Qualities*  
(From Cooper Marcus & Sachs, 2014, p. 66 - 70)

1. Contrast - the garden should feel distinct from the indoor setting
2. Shade - plenty of opportunities for people to sit in both sun and shade
3. Enclosure - the garden should be enclosed by fencing, a hedge, or adjacent buildings
4. Sense of Enclosure - even if not entirely enclosed, the garden should be designed to convey the sense that it is
5. Wayfinding - it should be easy to navigate to and within the garden
6. View - emphasize a sightline to the garden that is visible from the entrance
7. Legibility - provide a cohesive layout that begins at the entrance, so that messages are clear and consistent throughout
8. Entry Shelter - provide seating and overhead cover at entrance to the garden
9. Variety - create subspaces with different qualities
10. Accessibility - allow for wheeled entry and mobility through the space
11. Inclusivity - design with all user groups in mind, with spaces that accommodate each group's specific needs and habits
12. Prohibit Smoking in the garden

#### **Table 8. Recommended General Considerations from the Literature**

*Recommended Features & Qualities*  
(From Cooper Marcus & Sachs, 2014, p. 70 - 71)

1. Climate - allow use during climactic extremes
2. Sense of place - make the space distinctive and consistent with the tenor and goals of the place, by using specific plants, materials, and colors
3. Accommodate lying down - whether its a bench or lawn, there should be space for someone to comfortably stretch out
4. Views - incorporate views beyond the garden
5. Sound - provide naturalistic white noise
6. Gathering space - provide a patio or lawn that allows for social gatherings
7. Away from traffic - therapeutic spaces should be focused in places where people can enjoy them in relative privacy without disruption
8. Destination

## Table 9. Site Yields Forces + Processes

Seasons  
Decomposition  
Photosynthesis  
Evapotranspiration  
Gravity

### Yields

With these needs and goals identified, I moved onto the next step of look at existing yields. I assessed how they can help meet the identified needs, either through rearrangement of their current location in the system, by introducing appropriate technologies that put existing yields to use in a new way, or by introducing new site elements that work alongside existing yields to collaboratively produce desired outcomes. To the right is a list of site yields, that while not exhaustive, represents the analysis done for this project [Table 9]. It can be easy to omit yields, as it is not possible to list all things in existence on any one site, but we give it our best attempt and go from there.

Each site element, introduced or, if already present, kept onsite, has its own needs and yields, as shown with the example of the chicken in this Products & Behaviors Diagram [Figure 21].<sup>1</sup> The yields should include a process or resource that meets one of the identified needs for the site. This is the only reason to introduce or keep such an element. The yields should not include anything that cannot be “consumed” (processed, stored, or made inert)

1 Mollison & Slay 1994

### Elements

Sun  
Biomass  
Heat  
Buildings  
Plants  
Soil  
Stone  
Wind  
Pollinators  
Soil bacteria & microbes  
Carbon dioxide

onsite. It is important to note that not all yields can be put to use, especially not at the outset of a design and installation. And it is safe to say that there are always unexpected yields. Should those yields be overly noxious then the element introduced may need to be modified or removed altogether.

### Analysis

Matching the dozens and perhaps hundreds of site needs, and site yields, with site elements, their needs, and their yields, is an inherently complex and ever-evolving task, as site conditions change throughout the day, season, and across generations. New needs may arise, new expertise may become available, and the technologies of one generation may become obsolete.

Knowing this, it is important to emphasize that the needs and yields analysis conducted for this site places a marker in time, at a point in 2014 when these needs and these yields are most relevant. The needs and yields identified here should not be considered universal, timeless, or infallible. As extensive as this process is, the entirety of it will not be displayed in the body of this paper, but rather diagrammatically summarized here [Table 10].

Oxygen  
Rainwater  
Dew  
Water storage in basement of lower house  
Greywater from current uses  
Human byproducts (feces, urine)  
Rainwater catchment system  
Solar hot water system  
Olive trees

### Human Resources

Teachers  
Children  
Parents  
Local community members  
Community relationships  
Broad network of those who are aware of the program (in the US and Europe, + the Middle East)  
Cultural heritage of working the land  
Cultural pride  
Global concern for the Palestinian condition  
Compassion  
Interest  
Intrigue  
Curiosity  
Love  
Community spirit  
Hard work ethic  
Ingenuity  
Care  
Relationships

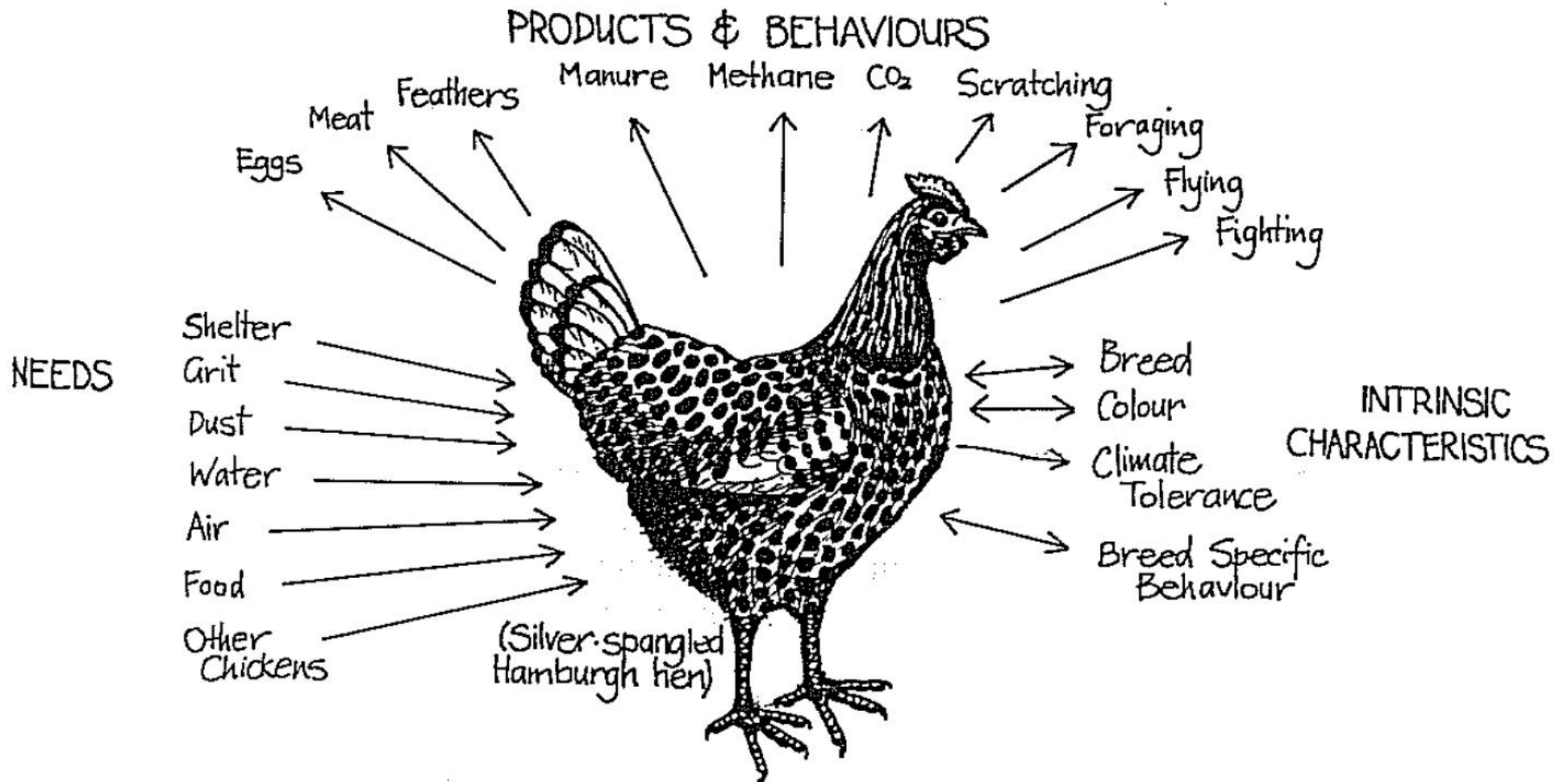


Table 10. Needs & Yields Analysis

Need	Universal Natural Forces & Elements	Location-Specific Natural Forces & Elements	Human-Made or Introduced/Cultivated	Human Resources	Social Capital
Food	Decomposition	Dew	Buildings		
Water	Photosynthesis	Rainwater	Olive trees		
Excretion	Evapotranspiration	Soil	Plants		
Security of Body	Seasons	Stone	Rainwater Catchment System		
Employment	Sun		Rainwater Storage System		
Resources	Ambient Heat		Solar Hot Water System		
Health	Wind		Greywater		
Property	Gravity		Human byproducts		
Love & Belonging	Oxygen				
Esteem					
Self Actualization					

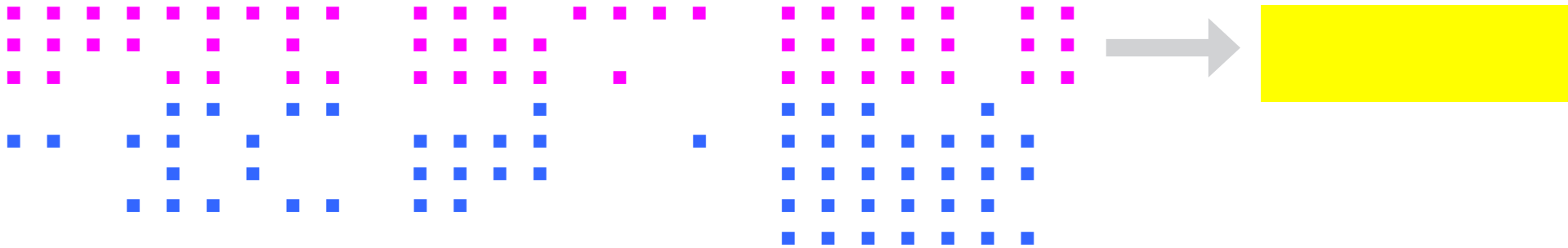


Figure 22.  
Physical interventions model healthy social behavior.

I have laid out Table 10 so as to demonstrate that there is a foundational layer of tangible, physiological needs that we can address through active participation with our environments, as shown where Maslow’s physiological and safety needs match with physical elements onsite. I have collapsed the intangible needs as well as intangible yields, as there is no singular, direct line between those needs and yields. Rather those yields are employed and those needs met by engaging the physical, tangible world in a healthy way.

### Meeting Intangible Needs

This brings up the difficult and uncertain task of meeting needs that are intangible, whose outcomes are subjective. In Maslow’s hierarchy, these are needs for love and belonging, esteem, and self-actualization. Meeting these needs is a complex and diverse process that varies from person to person and specific need to specific need. Meeting these needs is entirely open to interpretation, and is sensed and intuited, rather than touched or seen with the naked eye. Meeting these needs is a broad and immeasurable task.

The assertion of this thesis, however, is that the very act of collaborating with the land and meeting human physiological needs with our own strength, resolve, ingenuity, collaboration, and care, that this engagement with nature that is simultaneously productive and gentle is in itself a psychologically nurturing process. I propose that this work meets physiological needs in the moment and psychological needs over the longer term. So if HCP can focus on a process of growing food as a community, and on harvesting energy in an environmentally sustainable way, and on working together to develop our own ecologically-regenerative industry that celebrates culture while providing livelihoods, then the needs in Maslow’s categories of love and belonging, esteem, and self-actualization will find resolution in that process.

At the opening of this thesis I talked about how we can observe and interact with nature and that such activities allow us to see and to understand the healthy processes inherent in the natural world. These natural processes and properties of health, regeneration, and resourcefulness model healthy social and psychological behaviors for us. In looking at the needs and yields analysis, I have a vision for how to meet the first two

of Maslow’s tiers of needs (physiological and security). I propose that engagement with the landscape around us provides examples of healthy external behavior, behavior that serves to meet the needs of our internal landscape. Healthy engagement with events and materials that naturally occur, whether they are soil or the sun, shows us how to take inherently complex and challenging entities and make best use of their nourishing properties.

If we can do that same work with ourselves as humans - as people with both complex and challenging habits - and make use of our best properties to establish and sustain our emotional and psychological health, then we will find resilience both in our physical and psychological worlds. I see this as the goal of progress for life on earth - that disturbance, inevitable, regular disturbance - not damage us to the point of no return. Instead, we acknowledge that disturbance will come, and we prepare to experience it, reflect on it, act on it, learn from it, and then emerge a new but still healthy, caring, warm, peaceful, and solution-oriented human race. That is the very goal of this thesis: to establish these healthy habits that foster and reinforce inner and outer resilience. Since our point

### Table 11. Uses & Elements

- Vegetable Garden
- Fruit Trees
- Flowers
- Experimental Fiber Plots
- Active Play Spaces / Structures
- Passive Play Spaces / Structures
- Social Play Spaces / Structures
- Individual Play Spaces / Structures
- Rainwater Harvest
- Greywater Harvest
- Greywater Treatment
- Irrigation
- Fiber Trees
- Shade Canopy
- Benches
- Seat Walls
- Compost System
- Composting Toilets
- Community Kitchen
- Community Workshop
- Wind Breaks
- Fire Breaks

of entry is the land, natural forces, people, and our environment, then that is where we begin.

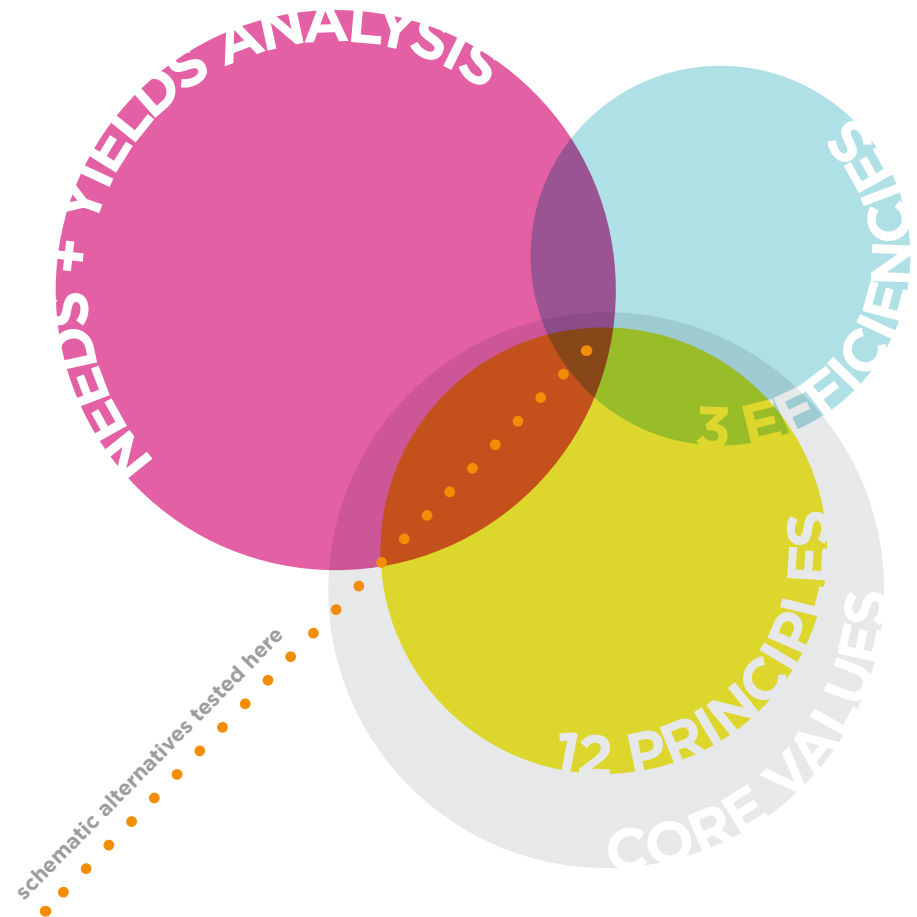
#### Site Elements: Beginning with Our Surroundings

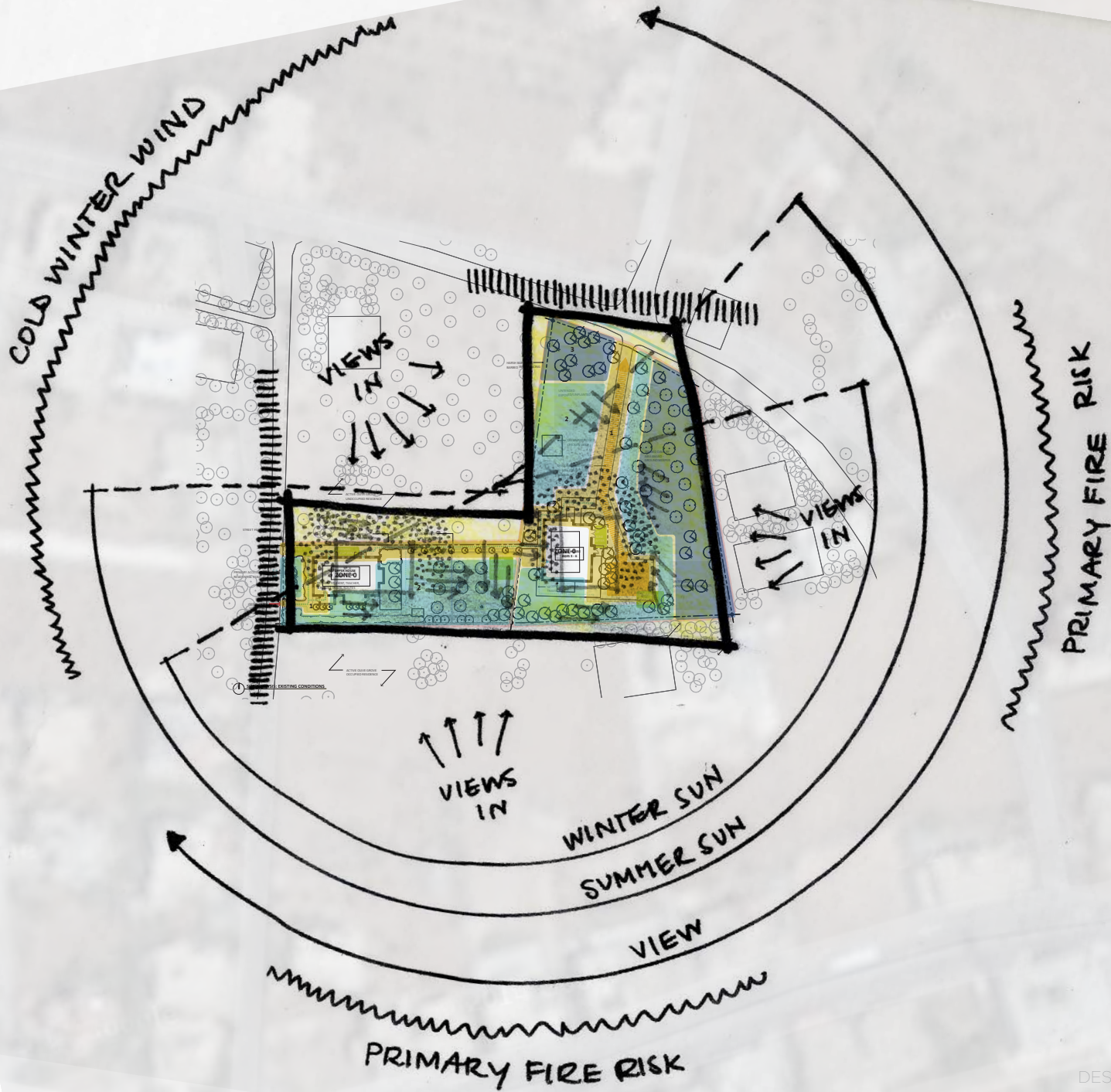
The process of identifying new and modified elements follows from the needs and yields analysis, which has helped us narrow our selections to those that will meet this specific set of site needs in concert with existing site yields. This process involves brainstorming known and experimental entities, and then trying out different ways of arranging them within a new, holistic system. Looking at precedents and then drawing from experience, I have devised such a list of elements [Table 11].

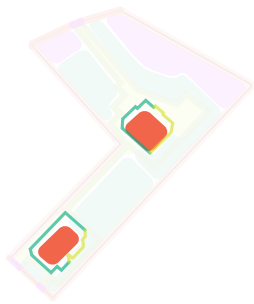
#### Zone Character

Once we have a list of site elements, it is time to place them in space. My method for placing site elements involves thorough understanding of all layers of site analysis and how they overlap to create spots of special character [Figure 24]. Where these analyses overlap, each zone shows that it encompasses a suite of characteristics [Figure 23]. For example Zone 3 is dry and exposed to wind and adjacent roads. By contrast, Zone 1 is where water pools and where there is the most shade. Knowing

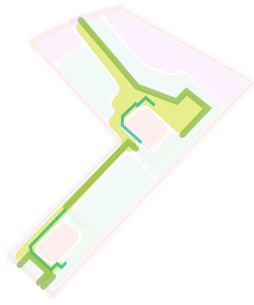
Figure 23. Venn Diagram of Permaculture Design



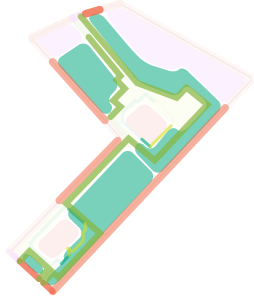




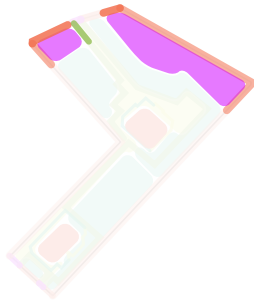
- ZONE 0
- | Active → Active
- | Passive → Passive



- ZONE 1
- | Active → Active
- | Active → Passive



- ZONE 2
- | E Active → Passive
- | E Passive → Passive
- | I Active → Active
- | I Active → Passive
- | I Passive → Passive



- ZONE 3
- | E Active → Passive
- | E Passive → Passive
- | I Active → Passive

**Figure 25. Zone Character**

**Command Center**

- Binary
- Most frequent use
- More than 5 visits per day
- Replete with amenities, tools, and shelter
- Primary infrastructure

**Active Corridor**

- Very frequent use
- 2 - 3 visits per day
- Primary corridor
- Primary play surface
- Hardscape
- Heat trap
- Sun & shade
- Adjacent to buildings

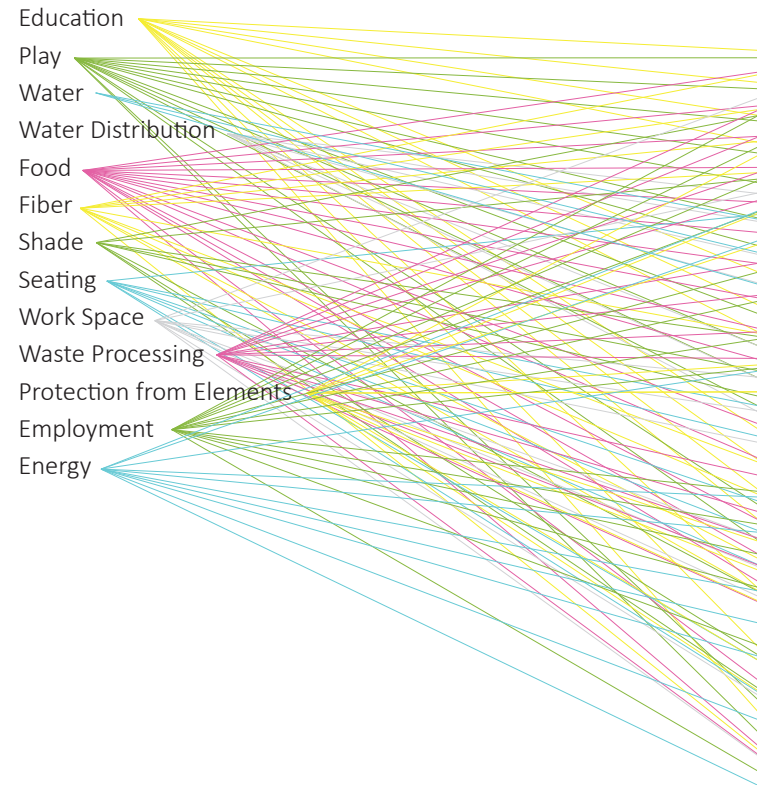
**Dynamic Fields of Activity**

- Regular use
- 1+ visit per day
- Sun & shade
- Wet & dry
- Highly visible
- Existing hardscape & plantings
- Exposed to wind
- Adjacent to neighbors

**Buffering Action**

- Rare use
- Visited weekly
- Sunny
- Dry
- Far from irrigation
- Exposed to wind & fire risk
- Exposed to roadway

**Figure 26. Needs, Yields, Zones, Phases**

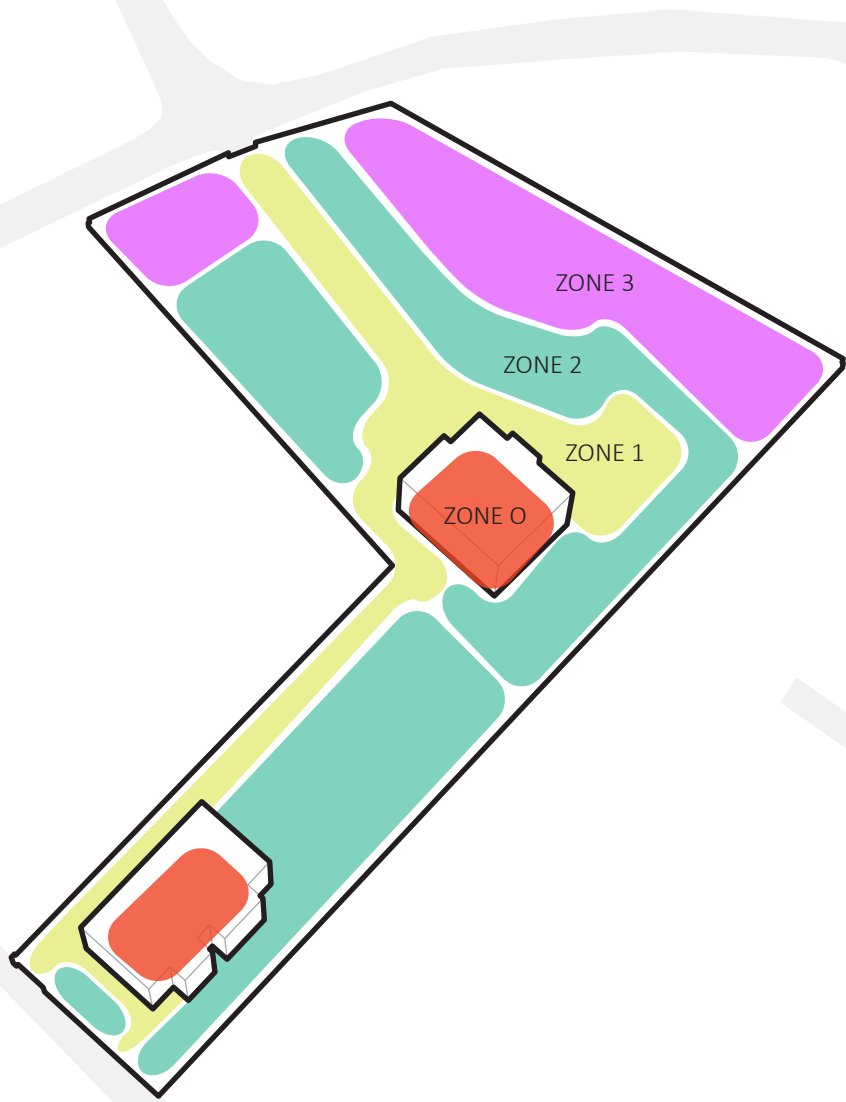


Diagrams at left show unique characteristics of each zone, as assessed by looking at edge conditions and layered analyses.

The Programmatic Needs & Elements diagrams show how each category satisfies two parts permaculture's three efficiencies: each element performing multiple functions and each function being supported by multiple elements.

The third efficiency, proper placement, is shown in the diagram above right, where each element is placed into a zone where it is best suited to the microclimates and frequency of attention available from those who use the site.

Program & Elements	ZONES				PHASES		
	0	1	2	3	I	A	O
Vegetable Garden			■				
Fruit/Nut Trees			■	■			■
Flowers			■	■			
Experimental Fiber Plots			■	■			
Active/Passive/Solitary/Social Play	■	■	■	■			
Rainwater Harvest	■						
Greywater Harvest & Treatment	■	■	■				
Irrigation		■	■	■			
Fiber Trees			■	■			
Shade Canopy	■	■	■	■			
Benches	■	■	■	■			
Seat Walls		■	■	■			
Compost System		■	■	■			
Composting Toilets	■	■	■	■			
Community Kitchen	■	■	■	■			
Community Workshop	■	■	■	■			
Fire & Wind Breaks		■	■	■			
Photovoltaic Panels	■						
Meditation Garden		■	■	■			
Outdoor Classroom		■	■	■			
Symbol		■	■	■			
Cottage Industry	■	■	■	■			



**PHASING PLAN**

**PHASE 1: Ingenuity (I)**  
Hydrologic + Nutrient Cycles

**PHASE 2: Abundance (A)**  
Rebirth & Growth

**PHASE 3: Opportunity (O)**  
Energy

the range of characteristics of each zone helps me place elements in such a way that they are best suited to that unique set of qualities. Varying arrangements of these elements within the site and its infrastructural systems will constitute our three schematic design alternatives. These alternatives will be designed to meet Permaculture's core values, and to satisfy its twelve principles and three efficiencies.

### **Phased Implementation: A Framework**

This project requires time-intensive interventions that take place over the course of many years. Both the Permaculture framework and the natural constraints of the site call for an incremental and well-planned implementation process. With this kind of sequential and iterative installation in mind, I have devised a series of stages that help rough out a path showing where we begin and where our actions will lead us. With this framework in hand we can approach the site knowing that each step will be different and unique, with its own set of challenges and constraints, and that it is natural for the process to unfold in this manner.

### **Phase 1: Ingenuity**

The first phase of design implementation relies on the catalytic energy of human ingenuity. Ingenuity is the birthplace of invention. Each small and ingenious improvement to a part of any system contributes to the advancement of the system overall. Site interventions introduced in Phase 1 will present the transformative properties of human Ingenuity. These interventions will "introduce" site users to the ways in which human inventiveness in harnessing natural forces can be sustainable, healthful, and healing. The entirety of the project will rely on human ingenuity more than anything else, so we introduce it first and build collective confidence in our shared and unique talents. In Phase 1, students, teachers, staff, and HCP community members will be able to see firsthand how their system improvements bring about better and/or more plentiful system yields.

Phase 1 consists of interventions that are quick wins, or early successes, and have a component with which the students, faculty, and local community can collaborate on building, and from which they will see an immediate and direct benefit. It is critical that the interventions in this

phase be easy to implement so that they build participant confidence in the overall project. In planning and design these small and relatively easy interventions are called "quick wins." Phase 1 will focus primarily on these quick wins, and through these interventions will build community will to engage in something longer-term and more intensive. Quick wins are inexpensive and relatively fast, but they also serve an important function of acting as models for the community. They track the arc of a story, in this case the story of how to begin, persist with, and complete a site improvement intervention. Quick wins allow the community to experiment with different approaches to site design, to figure out where it draws its collective inspiration, to work through varying ways of overcoming obstacles together, all within a low-stakes design and implementation process.

The design elements proposed for Phase 1 will be chosen because they are low cost and medium to high impact. They prioritize visible infrastructure and delightful elements that will be easy to identify and enjoy. They help build site and community awareness that a larger endeavor is underway. These quick wins can be installed in the space of a week, with a budget similar to the build

project from April 2014, a total cost of less than \$10,000. Their impact provides a mix of health and wellbeing improvements with interventions that allow for the site to produce or provide more services with the same resources it has now. With trauma and tension come sharpness, pressure, and stagnating flow. This phase seeks to smooth the sharp surfaces, bolster healthful circulation, and install pressure release valves where kids can explore without boundaries and where teachers can release through meditation and prayer.

### **Phase 2: Abundance**

My wildest aspirations for this project are that the ingenuity of the first phase will result in a newly realized abundance of resources, hope, inspiration, and community engagement. The second phase will take advantage of this abundance and deploy it in implementing more intensive projects, those that require more of an investment, greater commitment, more maintenance, but also more lasting and diverse yields.

Examples of this abundance might include abundance of water, harvested from the greywater and rainwater catchment and treatment systems. Abundant water will allow for liberal irrigation of the landscape, and

therefore the health of vegetation that currently goes underwatered and falls prey to disease and pests. Abundance may also include healthy annual crops of fruit, vegetables, compost, and fertilizers. This abundance can help to feed students and staff at the school, and with time and improved cultivation practice, can be sold or traded. The abundance that emerges from applying human ingenuity to the site is aimed at both allowing cost savings as well as offering a potential for revenue.

### **Phase 3: Opportunity**

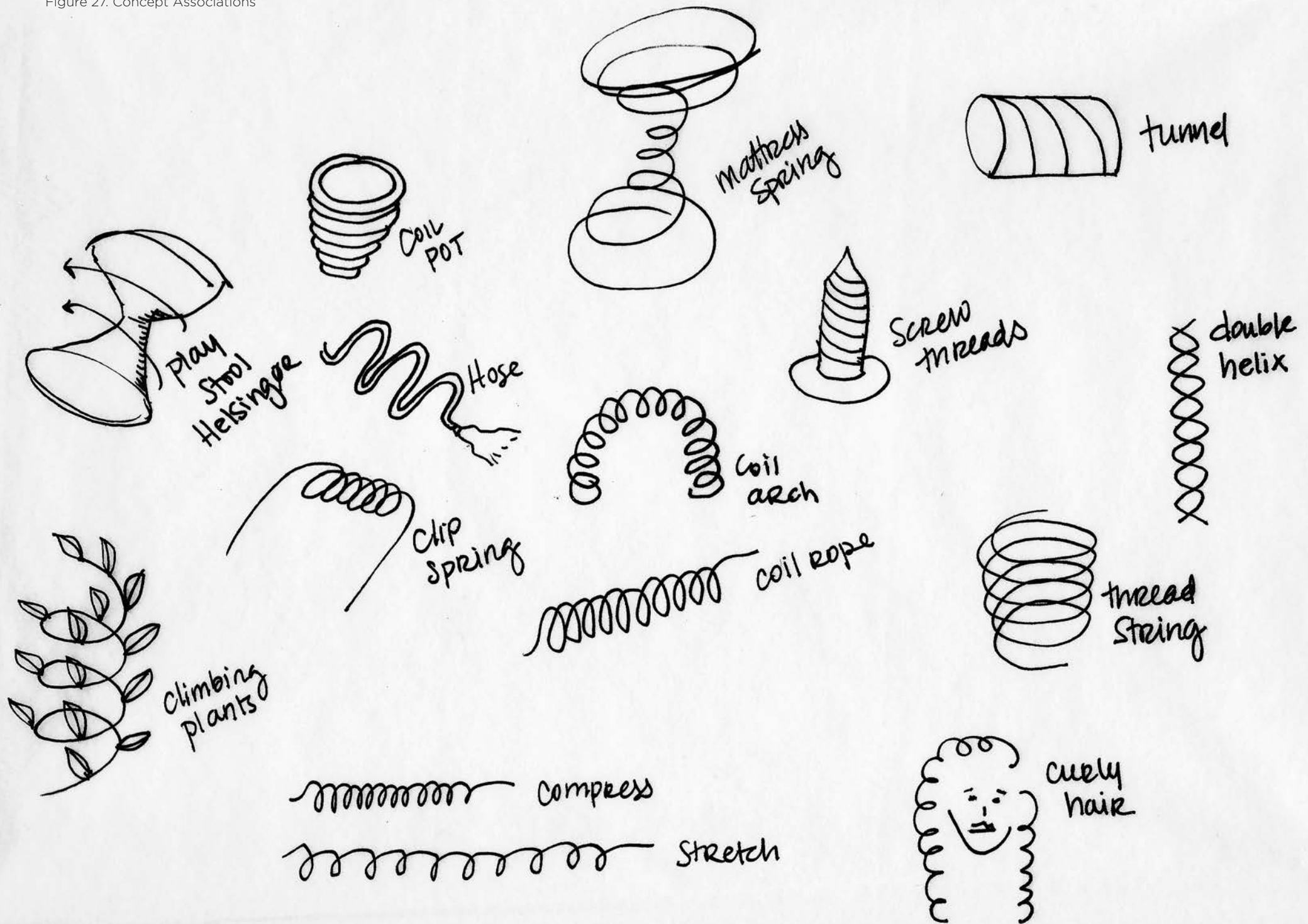
The third and culminating phase of this project is about sharing the abundance and yield achieved onsite through the two previous phases of infrastructure investment. Permaculture ethics tell us that sharing the yield – Fair Share – is as important to the success of the model as is environmental sustainability. The Opportunity phase turns the process of finding ingenious solutions and the evidence of abundant yield into a demonstration and capitalization stage for the project. During this phase the site will share its yield with the community by providing space and programming for others to learn from the HCP process of site development. The lessons learned along the way, through learning new technologies and techniques, will be shared with community members

who may seek to build their own livelihoods within the community. This phase is where most of the financial returns are realized onsite. All systems operating with redundant functionality will produce so much that their yield will be enough to sell to and to share with the community.

### **Phases Repeating**

Though these phases are explained here as progressing in linear fashion through a loose framework, it is likely that there will be iteration of these sequences. We may go through some aspect of all stages at once, in the first stage, or start with the first, move to the second, and then find that it is necessary to go back to stage one. This is natural and expected. But anticipating this does not negate the framework. Rather, the framework is intended to be scaled so as to show us how and why we engage our site at all. We begin through our own actions, through human ingenuity, which has some result, abundance, and that abundance brings us new opportunities. This is how I understand processes of engagement and resultant yield to unfold across all areas of my life. It makes sense to codify them here and then to allow them to be flexible: to be anything from a daily progression to that of a lifetime or for generations.

Figure 27. Concept Associations



# DESIGN CONCEPT

The guiding design concept that I propose for the Holy Child Program landscape is one of healthful cycles. My design challenge is to make those healthful cycles visible in the landscape in the form of natural cycles. There they will model healthful behavior. In thinking about patterns that repeat, but which change and make progress as they do so, I thought of cycles and forms that expand and contract and generally change as they move forward in space and time.

Forms that emerged from this exploration were the coil, spiral, and wave. Coils are cyclical but they also change as they move forward. There is energy in their form, suggesting potential and vitality. A coil can provide structure, its curves acting as horizontal members, or as an expansion and contraction joint between two entities, allowing for flexibility and protection at the same time. Coiled elements are resilient, as they can compress and then resume their form when pressure is released.

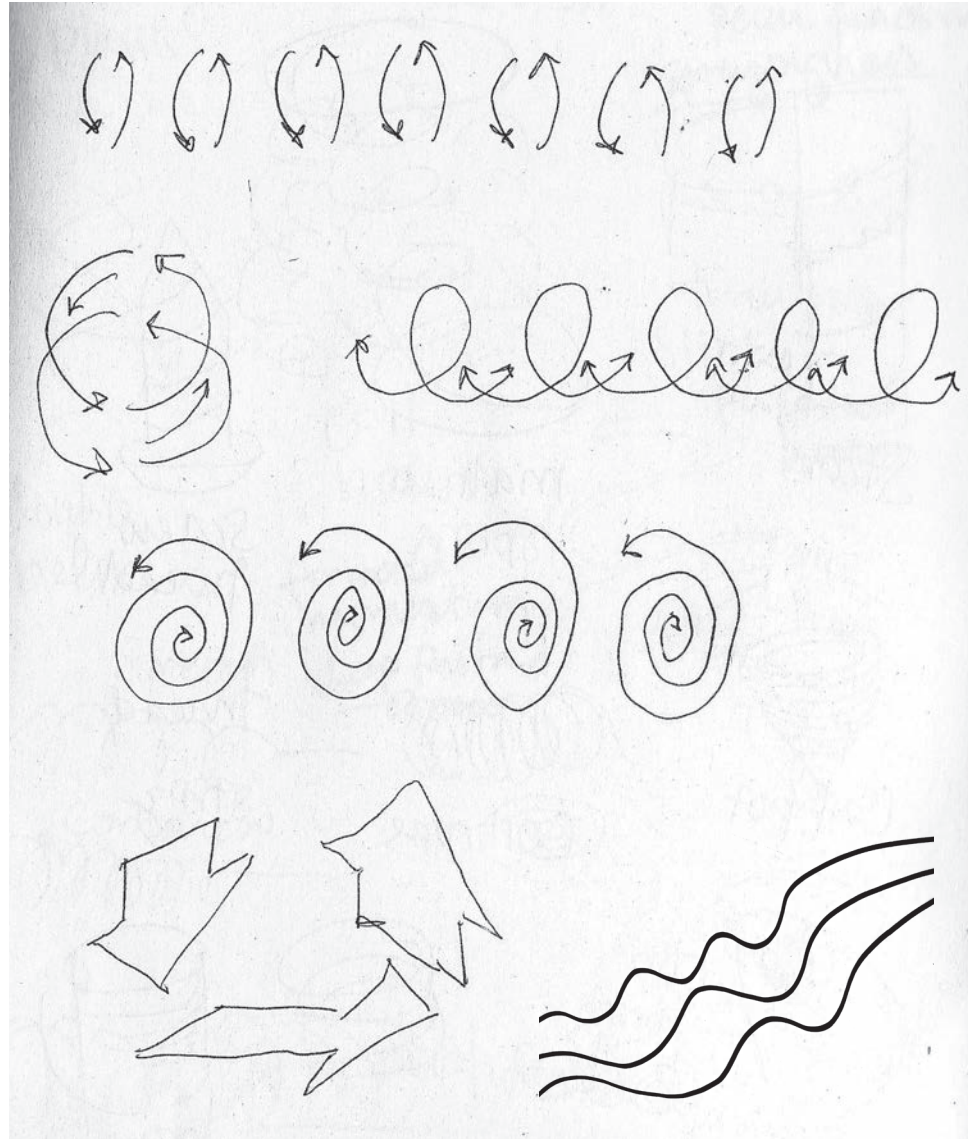


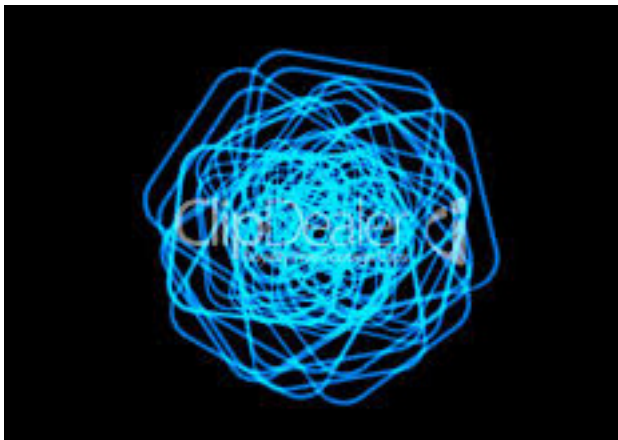
Figure 28. Concept Sketches

The circular form also refers to gathering, of arms encircling the community, of people sharing their time together. It represents collaborative effort, with individuals side-by-side sharing in a common goal. The wave offers additional form imagery, as an unfurled coil, a shape that imparts its own values. Waves are reliable, regular, and symbolize the highs and lows of life. If a difficult time comes, we “ride it out,” we hold tight and wait until it passes. Waves also refer to water, which is in such short supply on this site and in the region.

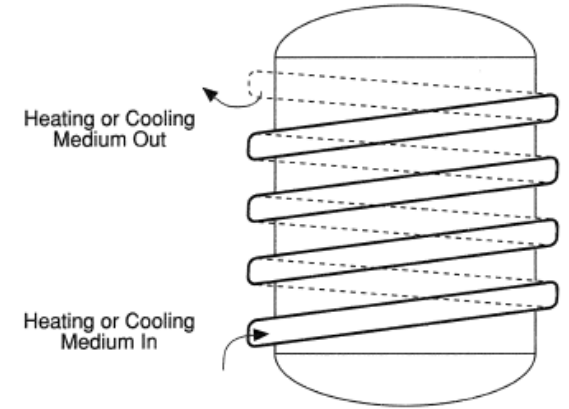
Together these symbols of the coil and the wave are metaphors for values and ideals for the Holy Child Program, of developing resilience, flexibility, strength, energy, and vitality, and of positive change over time. The following pages show imagery of coils, spirals, and waves that could be used to inspire landscape forms, furnishings, decoration, and more [Figure 28].



Coil, spiral, and wave paving patterns can make for a delightful aesthetic experience, but they also impart opportunities for play. Lines and curves on the pavement can be used for hopscotch and games invented in the moment. Abstract paving patterns are ideal for providing an open program, where play begins with just a bit of structure and then the left is open to human interpretation and imagination.



## PAVING PATTERNS



Cylinders have long been forms common in industry and agriculture, from smoke stacks to silos. Cylinders and rigid, coiled structures can be used for both their compressive and tensile strength, for containing water, providing strength to architectural elements, and as conduits for people, water, and waste.

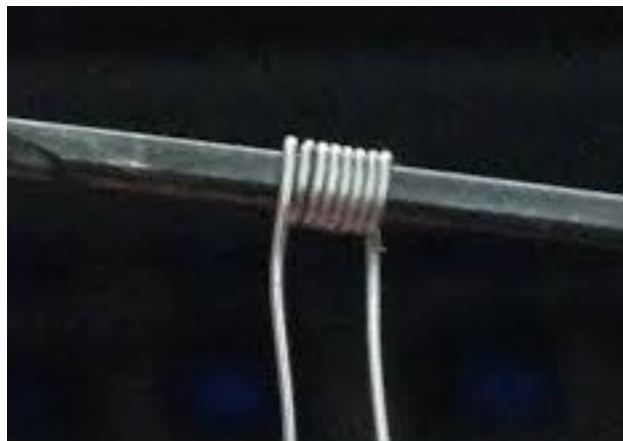
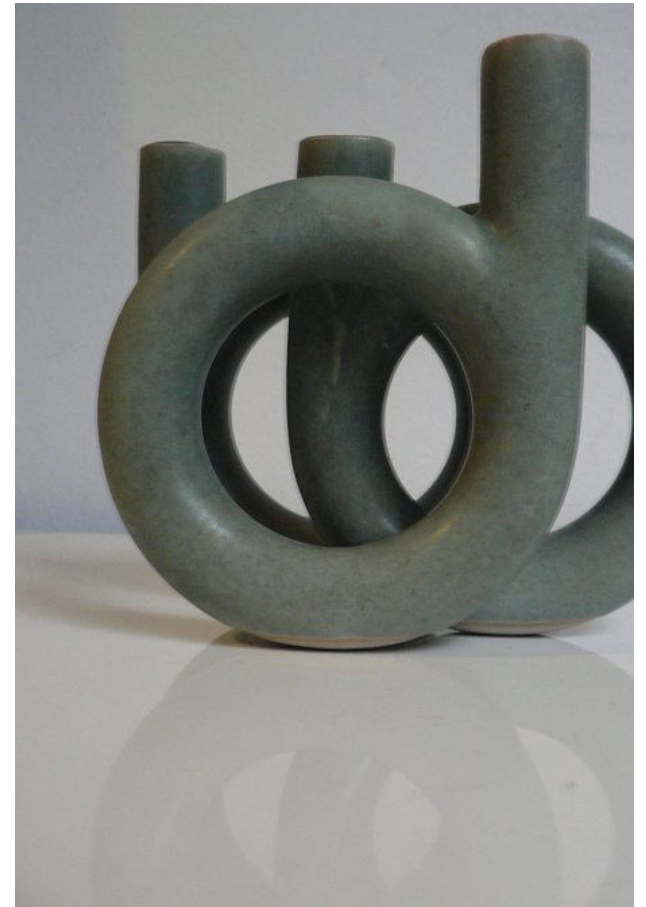


## INFRASTRUCTURE



A playground and educational program is a wonderful setting for whimsical and dynamic sculptural furnishings. Benches, fences, trellises, canopies, and play equipment could take form cues from jewelry and ceramics, as shown here. There are also opportunities for multifunctional elements, such as seat walls as retaining walls, and water collection cisterns as play towers.

## SITE FURNISHINGS



These dynamic forms demonstrate movement and robust structure at the same time. Children make good and heavy use of play equipment, so durable but creative forms are necessary for long-term functionality. These forms show coils and spirals overlapping and suspended in such a way that play could be invented within their open but robust structures.

## PLAY STRUCTURES



This site is a place where people congregate to learn, play, and share their everyday lives. Bringing whimsy onto site is a great way to calm moods, to inspire humor and creativity, and to make light of everyday events where appropriate. These forms suggest a whimsy, in coiled form, that could delight and inspire at the same time, providing distraction and diversion from the tougher parts of life.

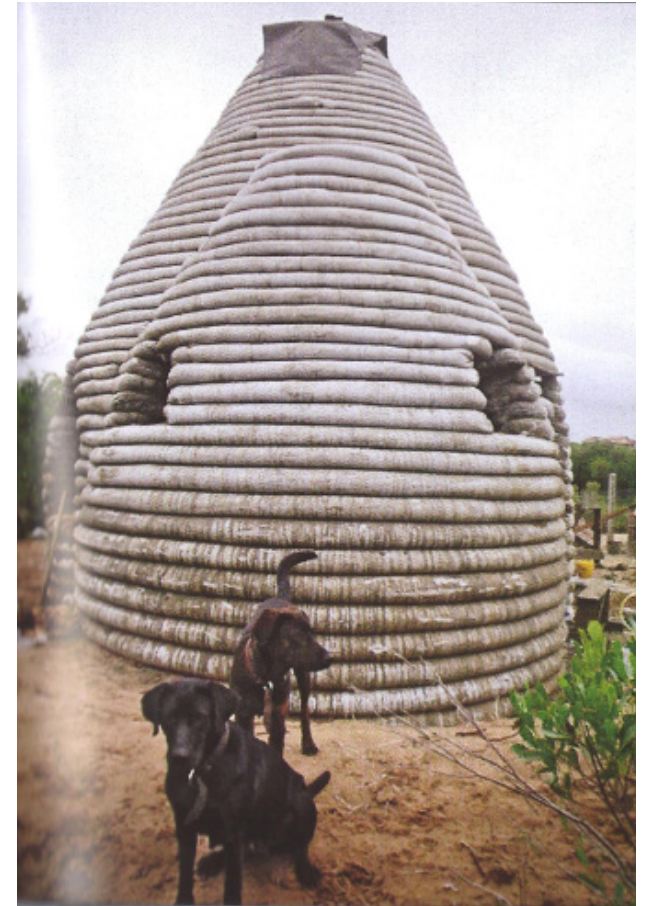
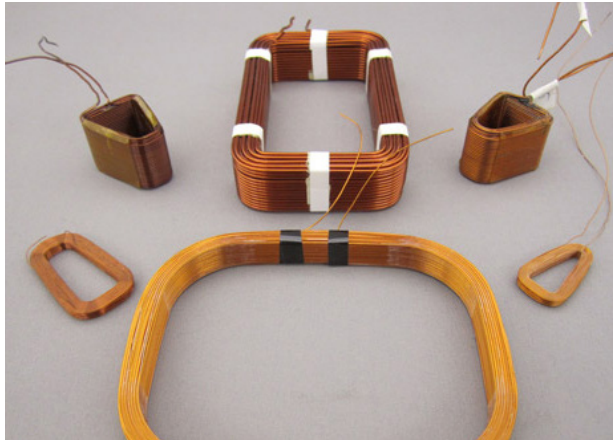
## WHIMSY



One of the long-term goals of this design project is for the Holy Child Program to develop cottage industries that can help support the program financially. It is also a goal to help members of the local community - parents, teenage and graduated HCP students - cultivate livelihoods that are rooted in local tradition and that make use of locally available, sustainable materials. Weaving, basketry, and ceramics are mainstays of Palestinian craft traditions, and could also invoke the design concept of coils and spirals.

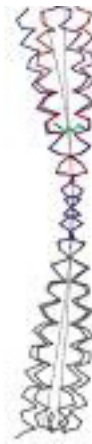
## **COTTAGE INDUSTRY**





At least one site need calls for an enclosure - the meditation garden. Future needs could require additional architectural structures. These coiled enclosures represent both vernacular architecture as well as contemporary pre-fab design. Their circular, coiled shapes conjure the site's design concept. The wire coils suggest how these coiled structures could be modified to take on more rectangular forms while maintaining their inherent coiled construction.

## STRUCTURES



Some of the vegetation onsite will be trellised, espaliered, or grown in containers. Planting beds are another option. These forms give ideas for coiled apparatuses on which plants could grow and climb. They also could be used as inspiration for seat-wall planting beds or planted berms.

## VEGETATION STRUCTURES



Throughout the onsite design and installation process there will be opportunities for including decor and celebratory elements that mark milestones in the process. These elements could embody the concept and leave behind memorable artifacts that remind the community of the activities that have occurred there.

## DÉCOR



EVENING IN BETHLEHEM

# MATERIAL HERITAGE

The symbols of the coil, spiral, and wave interact with Palestinian and Jordanian artistic and cultural heritage in a complementary way. Much of the art and culture of Jordan and Palestine are historically one in the same. Despite the two territories' recent geographic separation from one another, they continue to manifest similar folk art, iconography, crafts, and trades. For this reason I will draw on both Palestinian and Jordanian cultural traditions. Both historic and contemporary symbols of these cultures are highly representative of agriculture, geometry, and natural earth forms.



stacked stone walls



hills & mountains

## Landscape Forms

- Terraces
- Stacked Stone Walls - Dry & Mortared
- Hills
- Mountains
- Wadis (ephemeral surface runoff channels)
- Stepped Retaining Walls
- Thin Coats of Ephemeral Vegetation
- Shade Sails
- Trellis
- Wide Stone Stairs
- Rectilinear Division of Domestic Space
- Circular Tree Wells Made of Stone

Palestinian cultural heritage is very much intertwined with qualities of the land and its cultivated products. Beginning with the land forms themselves, cultural points of reference include ancient land forms as well as food and fiber proudly grown throughout the region.

Naturally occurring land forms include wadis, which are a type of canyon or enlarged swale. Wadis were formed by surface runoff carving away at layers of stone. Many still serve as runoff channels for ephemeral streams. Wadis are often sites of recreational activity, much like the national parks of the United States.



wadi



stepped retaining walls



trellis



thin coats of ephemeral vegetation



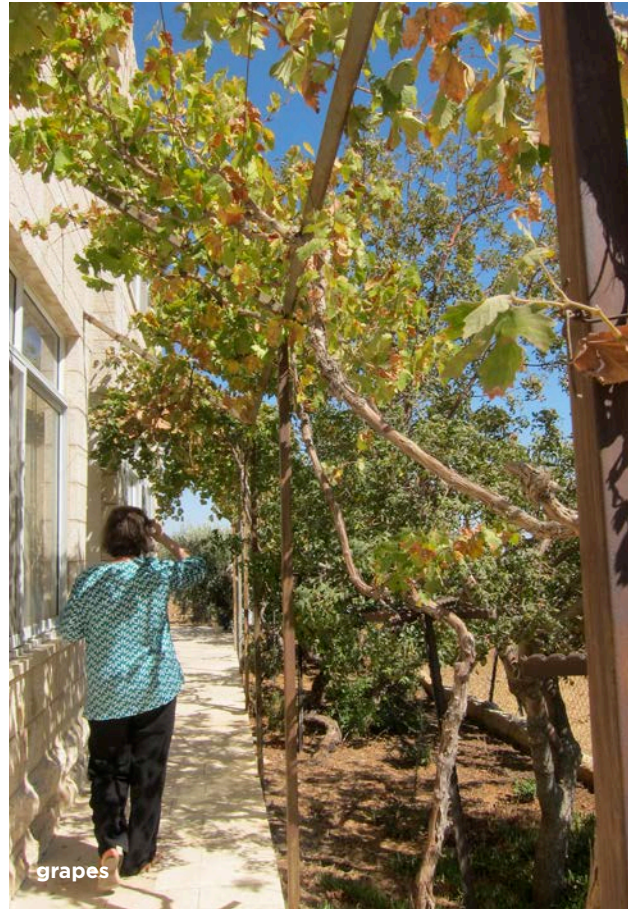
terraces



shade sails



figs



grapes



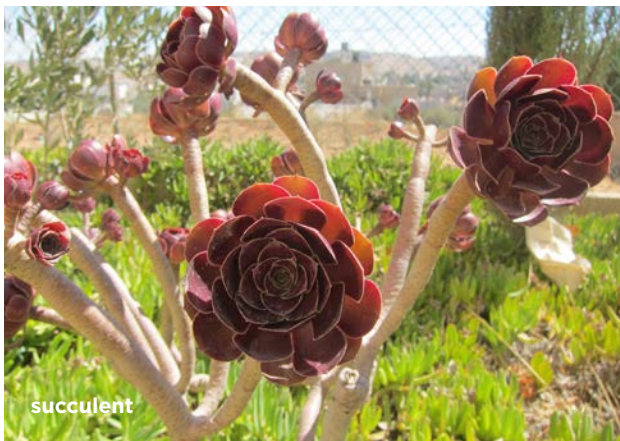
guava



citrus



fig



succulent



stone irrigation channels



olive groves

### Agricultural Heritage

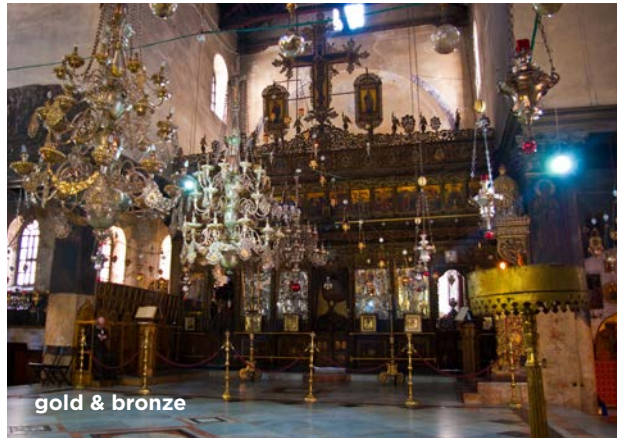
- Olives
- Citrus
- Stone Irrigation Channels
- Grape
- Palm
- Succulents
- Almond
- Pistachio
- Desert Herbs
- Fig
- Guava
- Eggplant

Agricultural heritage in Palestine is very strong, one of the most pride bearing traditions of this place. The Palestinian people have long connected with the land as giver of life and livelihood, as well as enjoyment in the form of food. Conjuring Palestinian agricultural and culinary traditions brings joy for many who live there and enjoy the fruits of these long-held agricultural and resultant practices of cooking foods grown locally.



### Materials

- Stone Block
- Stone Veneer
- Glass
- Tile
- Gold & Bronze
- Thread
- Olive Wood
- Concrete
- Iron



Stone and tile work abound throughout the region. Building materials consisted primarily of stacked stone, and despite transitions to concrete structures, most buildings in the region are faced with the local sandstone.

The abundance of olive groves in the region also brings a rich heritage of working with olive wood as a decorative material. Olive wood carvings are very popular among both locals and tourists.





stone carving



fiber weaving



mosaic



olive wood carving



cross stitch



painted tile

### Craft Techniques

- Mosaic
- Painted Tile
- Stone Structural Decoration - Assembly Made Evident
- Fiber Weaving
- Cross Stitch
- Olive Wood Carvings
- Stone Carving

Stone and indigenous clay soil together conspired for a rich tradition of mosaics and anthropomorphic stone and clay sculpture. The mosaic tradition was particularly prominent during the Byzantine period (332 - 640 AD) and continues in force today.



animals, harvest, plants



citrus wheel

### Symbols

- Christian Cross
- Animals
- Harvest
- Geometric Patterns
- Plants
- Stars
- Circles
- Citrus Wheel



stars & circles

Mosaics and painted tile often depict harvest, human figures, fruit, vegetables, and goods heading to market. The Muslim influence brought geometric patterning into the design schemes, and so today we see a range of geometric designs devoid of human imagery.

Also prominent in the Christian towns of Bethlehem and Beit Sahour are symbols of Christianity, including the Christian cross.



christian cross



### Architectural Heritage

- Domes
- Arches
- Towers
- Spires
- Minarets
- Flat Roofs
- Small Windows
- Classical Columns
- Towering Vaulted Ceilings / Halls
- Double-Arch Doorway
- Symmetry
- Groin Vaults
- Light Relief Surface Articulation



The Byzantine architectural influence is strong here, and so is the Islamic form of the minaret. Byzantine structures tend to serve Christian functions, with the bulk of buildings and heritage sites dating back to the time of Constantine in the fourth century AD.

The architecture also strongly represents the climate in this region - hot and windy. Stone serves as a thermal mass, insulating against both cold and heat. Small windows refer both to the time when glass was not available but also to the need to keep out of direct sunlight in hot seasons.



BOUGAINVILLEA GROWING ONSITE IN LATE SUMMER

**Where flowers bloom,  
so does hope.**

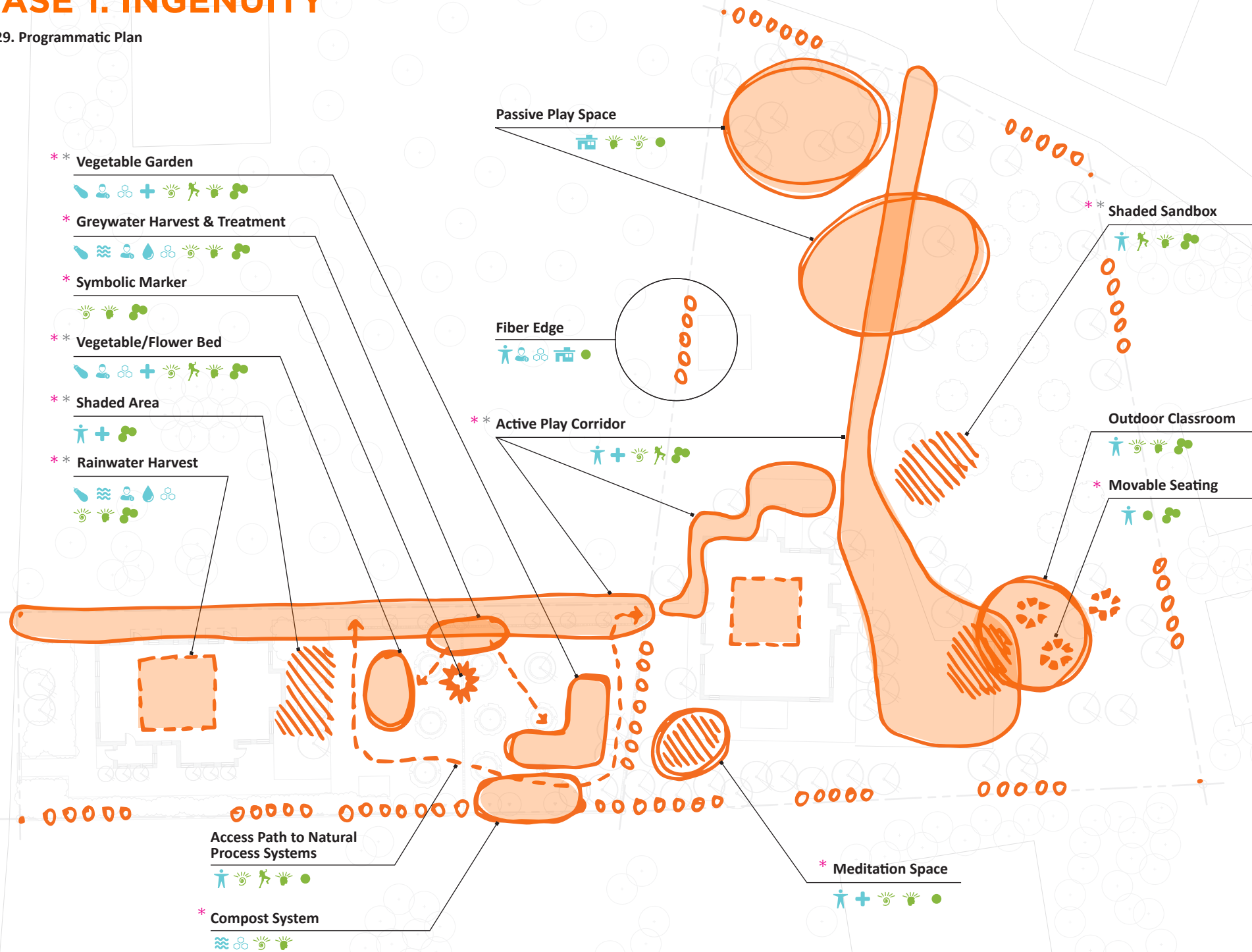
Lady Bird Johnson

# DESIGN RECOMMENDATIONS

Equipped with a robust body of research and analysis I can move forward in looking at phased interventions that will bring about desired outcomes of enhanced health, efficiency, productivity, education, and respite onsite at the Holy Child Program. I now have a number of threads to bring together. It is my task to unite a variety of frameworks (e.g. permaculture principles, Maslow's hierarchy of needs, cultural heritage), recommendations, and lessons from each phase of this process. With each of these in mind I have laid out a guiding program for the site that locates functions and elements in relation to one another so that they perform most efficiently in taking advantage of other site assets, existing and new.

# PHASE 1: INGENUITY

Figure 29. Programmatic Plan



\* \* Vegetable Garden



\* Greywater Harvest & Treatment



\* Symbolic Marker



\* \* Vegetable/Flower Bed



\* \* Shaded Area



\* \* Rainwater Harvest



Passive Play Space



Fiber Edge



\* \* Active Play Corridor



\* \* Shaded Sandbox



Outdoor Classroom



\* Movable Seating



Access Path to Natural Process Systems



\* Compost System



\* Meditation Space








\* **Site Elements Desired by Students & Staff**

\* **Site Elements Already in Place**

**Site Needs, from Maslow's Hierarchy**

-  Food
-  Water
-  Excretion / Byproducts
-  Security of Body
-  Employment
-  Resources
-  Health
-  Property

**Key Design Aspects for Healing Gardens**

-  Sensory Stimuli
-  Physical Movement
-  Psychological Movement
-  Safe Seclusion
-  Social Interaction

**Phase 1: Ingenuity**

As outlined in the phasing framework of the Design Approach section, first steps will include programmatic interventions that bring easily discernible delight, and which allow the site to do more with the same or fewer resources. Logistically complex or costly investments will not be made at the early stages and so increased revenue is not expected. Rather, the ingenuity introduced here will allow for cost savings, through more efficient use of existing resources.

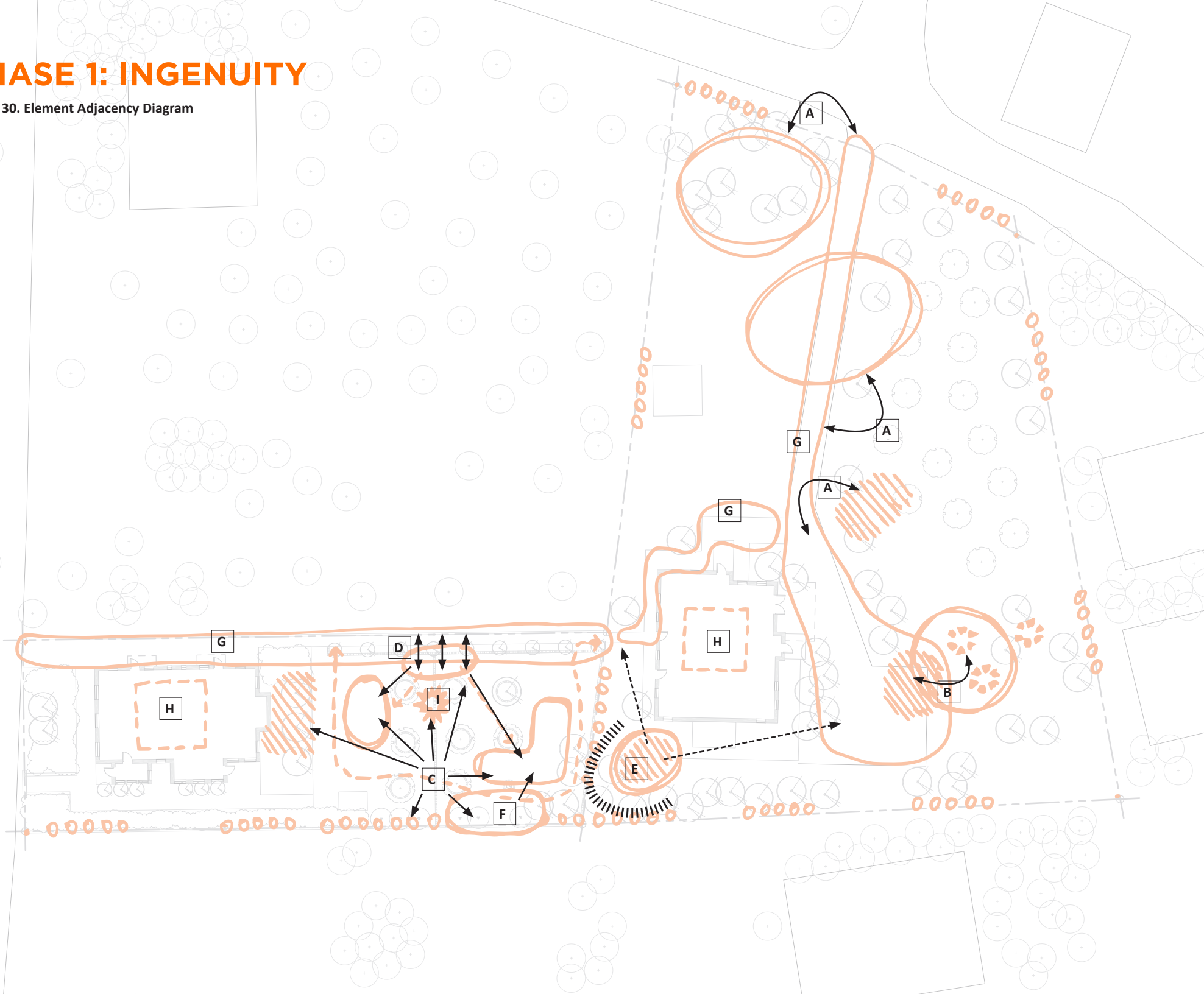
The programmatic elements I propose for Phase 1 have been chosen because they are low cost and will be immediately impactful when installed. They prioritize visible infrastructure as it demonstrates healthfully functioning natural cycles. Phase 1 programmatic interventions prioritize delightful elements that will be easy to identify and enjoy. They help build site and community awareness that a larger endeavor is underway. These are quick wins. They can be installed in the space of a week, with a budget similar to the build project from April 2014; less than \$10,000. Phase 1 program elements are diagrammed and described at left. The associated icons indicate the degree to which each

element meets needs from Maslow's hierarchy as well as the Key Design Aspects for Healing Gardens, as outlined by Clare Cooper Marcus and Marni Barnes. The fact that each element meets multiple needs is a testament to the rigor of the needs and yields analysis and satisfies Permaculture's principles of efficiency, where each element performs multiple functions, and each function is supported by multiple elements. The third principle of efficiency states that elements should be placed so as to maximize their functionality within the system. The adjacency diagram on the following page illustrates how elements are connected within the system so as to maximize their conspicuity as visible, healthful, natural cycles in process. Their placement is also designed to capitalize on site microclimates as well as the ability of each new element to contribute to and feed off of other elements within the system.

With trauma and tension come sharpness, pressure, and stagnating flow. This phase seeks to smooth the sharp surfaces, bolster healthful circulation, and install pressure release valves where kids can explore without boundaries and where teachers can release through meditation and prayer.

# PHASE 1: INGENUITY

Figure 30. Element Adjacency Diagram



- A** Passive and active play opportunities are maximized when placed next to one another. Children can alternate between them easily as their needs change throughout the course of a play period.
- B** Active play and outdoor classrooms overlap so that children make easy connections between what is experienced through play in the landscape and what is learned while interacting in an academic way.
- C** Walking loop / access path is placed so that all natural processes made visible in this phase are available to view across its length. The path also provides functional access for maintaining these systems.
- D** Greywater treatment system is placed along most frequently used corridor so that its processes are highly visible to passersby. Also placed here for easy access to vegetable gardens and downslope from source (building).
- E** Meditation Garden placed at a distance from primary circulation and play areas. Space is buffered from adjacent noise and activity with fiber edges.
- F** Compost system placed next to vegetable garden for ease of moving plant material to it. Also placed along path for ease of access and moving finished compost around the site.
- G** Active play corridors correspond with the site as it is currently used, and serve simultaneously as primary circulation routes.
- H** Rainwater harvest system remains atop buildings. Height allows for gravity-fed water pressure, large system placed in otherwise unused area, and buildings are adjacent to vegetable beds and other vegetation.
- I** Phase 1 symbolic element (eg. sculpture, statue) placed in the landscape to illustrate connection between functions introduced in this phase (eg. greywater harvest)

## Support for Phase 1 Elements in the Literature

### Meditation Space

"Make every effort to provide at least one separate outdoor space that is only available to staff."<sup>1</sup>

### Multiple Vegetable / Flower Gardens

"Provide more than one garden in more than one location."<sup>2</sup>

### Access Path

"A walking loop encourages physical activity."<sup>3</sup>

### Outdoor Classroom

"The desire to use the building as a teaching-tool to illustrate the concepts of Permaculture inspired the design not only to integrate the building into the curriculum but to attempt to influence the relationship between the building and its users."<sup>4</sup>

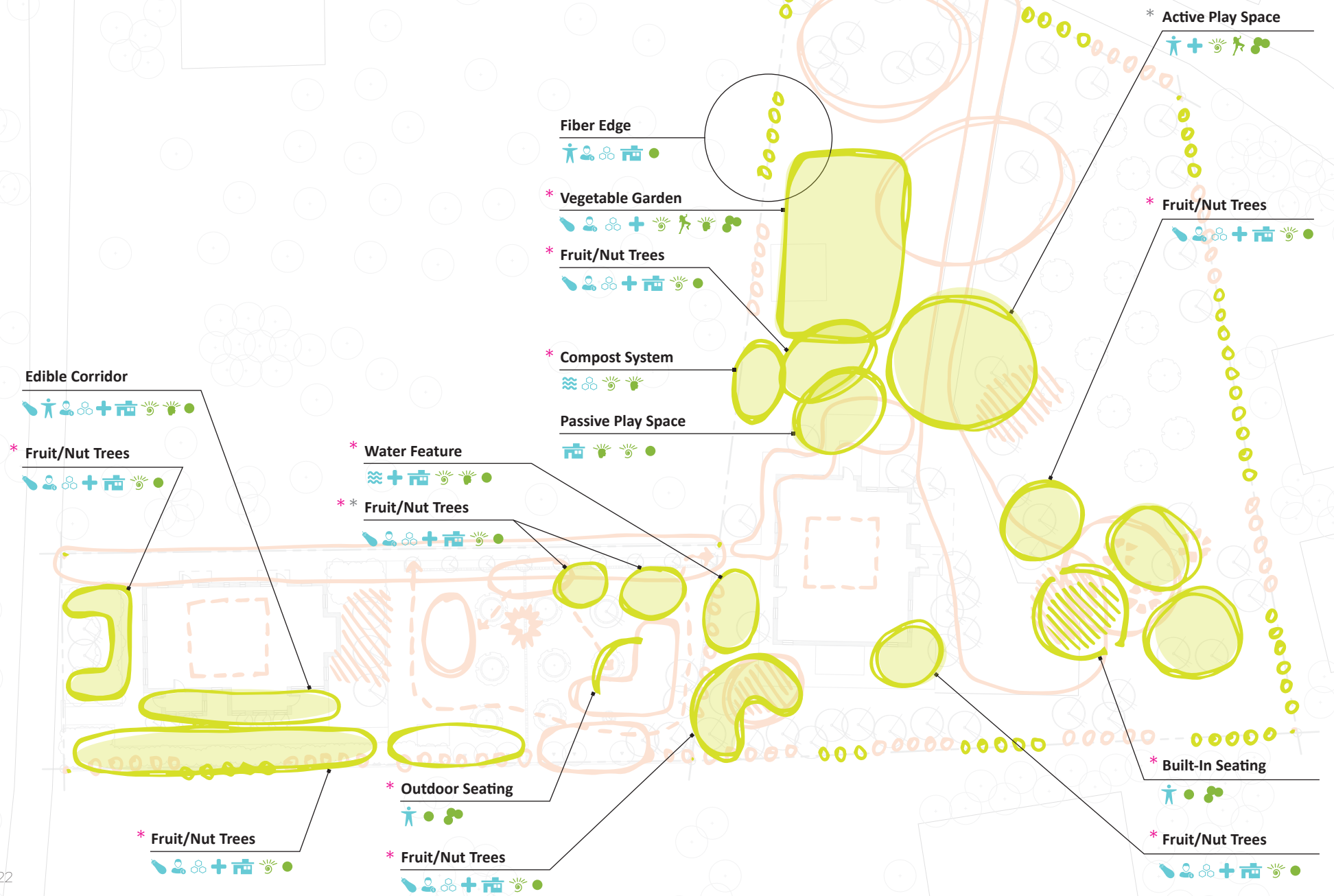
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1, 2, 3 Cooper Marcus & Sachs 2013

4 Holser & Becker 2011

# PHASE 2: ABUNDANCE

Figure 31. Programmatic Plan








## \* Site Elements Desired by Students & Staff

## \* Site Elements Already in Place

## Site Needs, from Maslow's Hierarchy

-  Food
-  Water
-  Excretion / Byproducts
-  Security of Body
-  Employment
-  Resources
-  Health
-  Property

## Key Design Aspects for Healing Gardens

-  Sensory Stimuli
-  Physical Movement
-  Psychological Movement
-  Safe Seclusion
-  Social Interaction

### Phase 2: Abundance

Phase 2 centers around the celebration of abundance realized from the ingenuity deployed in Phase 1. The natural processes made visible here are those of plant life, and the ways in which the seasons, sun, and other natural forces affect the growing process. The abundance brought about in this stage is achieved through increases in resource yield - fertilizers from compost and water from greywater and rainwater harvest. Primary agents of abundance are human labor, but with Permaculture are used efficiently so that maximum yield is derived from minimal exertion. Food and fiber are the primary foci here, which provide tangible evidence of the effectiveness of actions taken in Phase 1.

Shared yield is emphasized during this phase, as the abundance realized may provide more than the site can absorb. Enterprise can be planned and considered through observation of successful crops and experimentation with best planting and harvest practices.

The programmatic elements I propose for Phase 2 are slightly more cost and time intensive than those implemented in Phase 1. Phase 2 builds off of the success of Phase 1, and makes use of the confidence cultivated through quick wins. Interventions take a bit longer to implement, require a bit more care with their maintenance, but yield a much greater bounty than was available in the first phase.

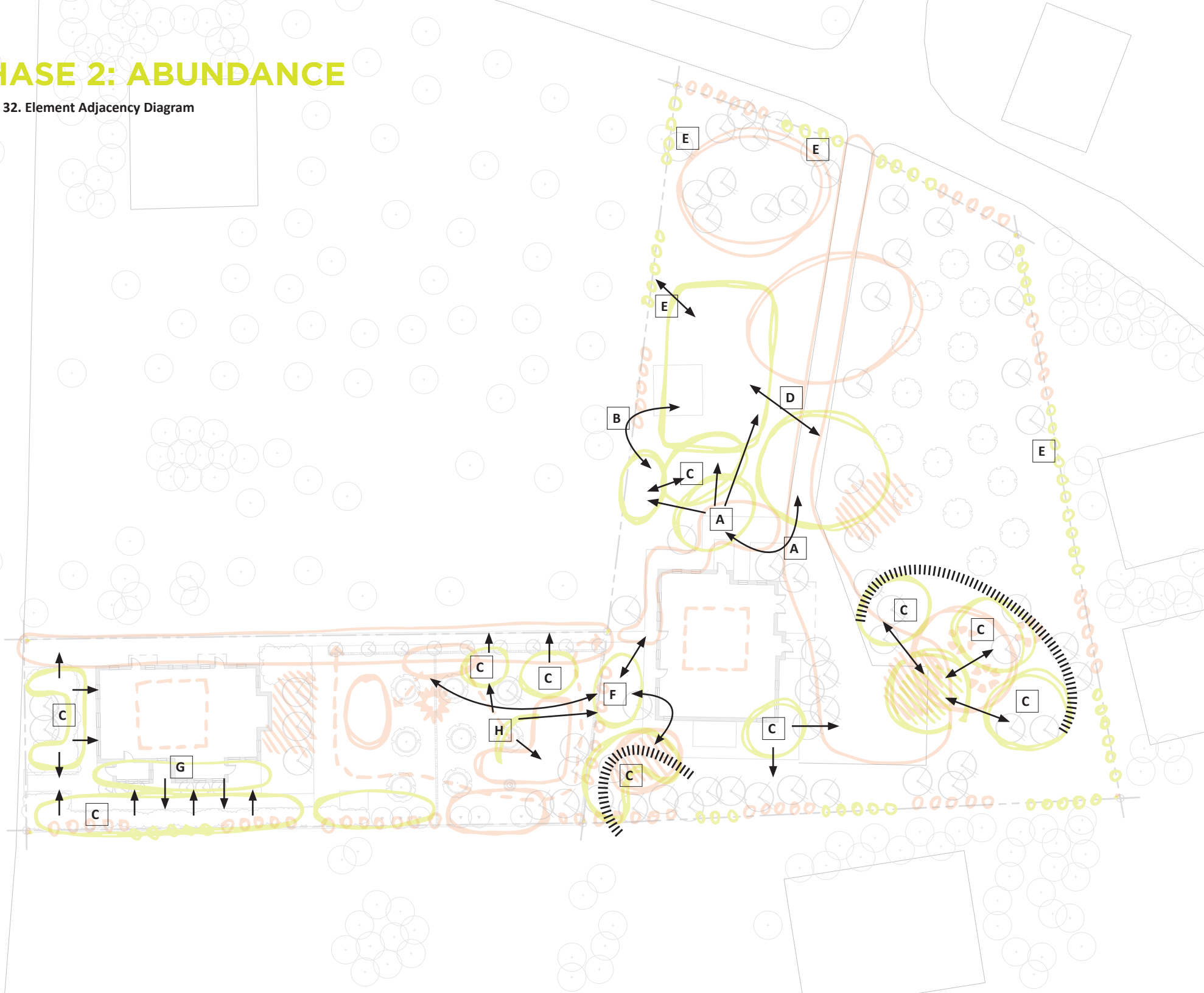
Furthermore, lessons gleaned from pilot projects in Phase 1, such as movable seating, small compost systems and vegetable gardens, can be applied at larger scales. Those involved in Phases 1 and 2 will have learned so much about the most successful crops and maintenance practices that their improved processes will save time and resources while bringing about greater yield.

Phase 2 program elements are diagrammed and described on the previous page. As with Phase 1, the adjacency diagram on the following page illustrates how elements are connected within the system so as to maximize their conspicuity as visible, healthful, natural cycles in process. Their placement is designed to capitalize on site microclimates as well as the ability of each new element to contribute to and feed off of other elements within the system.

A successful first stage will have smoothed over the harshness of trauma, and this second phase is designed to make use of newly open attitudes toward personal and environmental renewal.

# PHASE 2: ABUNDANCE

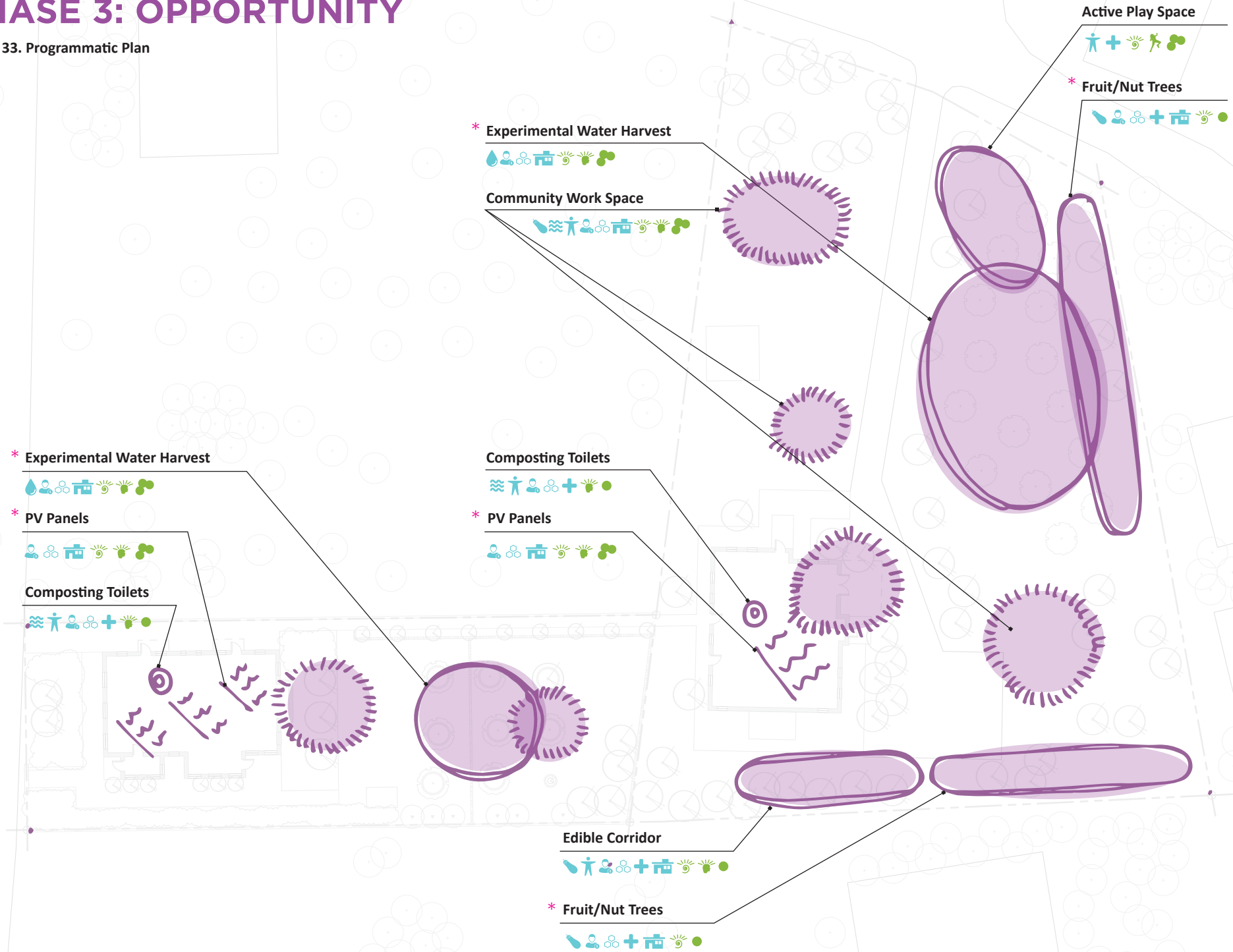
Figure 32. Element Adjacency Diagram



- A** Passive and active play opportunities are maximized when placed next to one another. Passive play placed next to fruit trees, vegetable garden, and compost system so as to pique interest of children.
- B** Compost system placed next to vegetable garden for ease of moving plant material to it and compost yield to fruit and vegetable plants.
- C** Fruit/nut trees placed next to compost system so that vegetation is easily transferred into compost piles. Also placed along circulation corridors for lifecycle demonstration and easy harvest. Serve as buffers as well.
- D** Vegetable garden placed in unused area with maximum sun exposure. Also placed next to active and passive play areas so that it receives needed attention.
- E** Fiber edge placed next to vegetable garden so that yields can be used for garden structures, path materials, and more. Serves as a buffer to the main arterial and adjacent parcels. Also fills in spaces not planted during Phase 1.
- F** Water feature placed downslope of greywater harvest system to be easily gravity fed. Also placed next to Meditation Garden for soothing sounds and calming imagery.
- G** Edible corridor placed along southern edge for sun exposure. Edible plants grown on trellises together provide shade for this warm circulation path.
- H** Symbolic seating space placed next to Phase 2 elements to demonstrate connection between symbolic images and natural processes emphasized in Phase 2.

# PHASE 3: OPPORTUNITY

Figure 33. Programmatic Plan








### \* Site Elements Desired by Students & Staff

### \* Site Elements Already in Place

### Site Needs, from Maslow's Hierarchy

-  Food
-  Water
-  Excretion / Byproducts
-  Security of Body
-  Employment
-  Resources
-  Health
-  Property

### Key Design Aspects for Healing Gardens

-  Sensory Stimuli
-  Physical Movement
-  Psychological Movement
-  Safe Seclusion
-  Social Interaction

## Phase 3: Opportunity

Phase 3 is the culminating stage of this design and intervention project. This phase focuses on making processes of energy conversion and waste processing evident onsite. By this stage most of the intensive infrastructure and system processes have been installed, experimented with, and lessons have been taken from those stages. The system should be working like a well-oiled machine, producing food, fiber, and water. At this point the site should be able to realize some economic gain from all of this hard work.

Community work spaces will allow those who interact with site systems to transform site yields into products to bring to market. With the savings realized from the previous two stages of increased resource culling and saving, there could be room to make heavy investments in photovoltaic (PV) panels and composting toilets. These two types of infrastructure are among the most time and cost intensive of any intervention proposed to this point, and will require quite a bit of effort to bring into existence onsite.

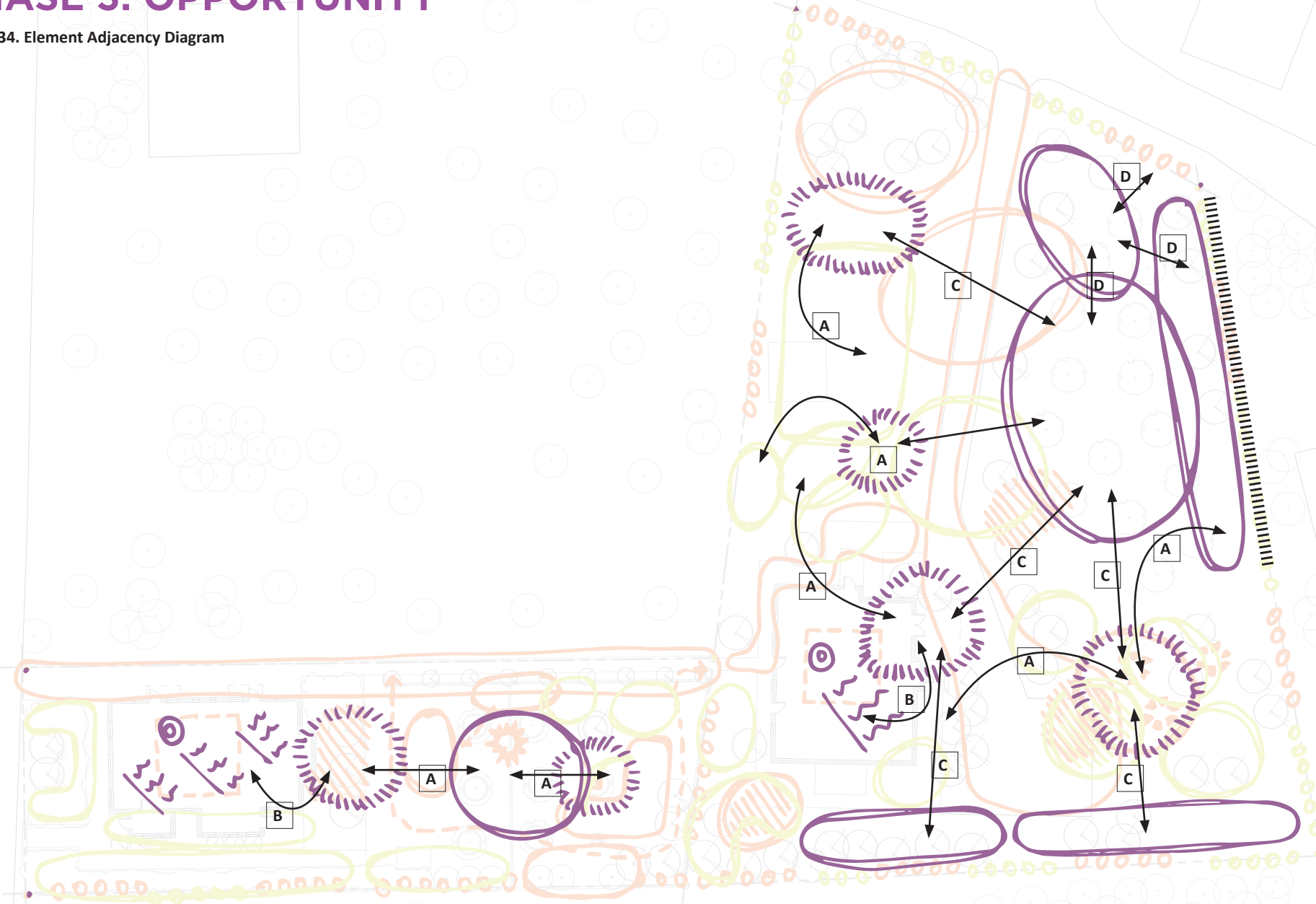
All efforts leading up to this stage can help support a push to finance heavier infrastructure, especially if the efforts have been documented and can be presented to funders as evidence of sweat equity. HCP staff know of several funders who are interested in supporting solar panel projects in Palestine, and the hard work done onsite would make a great case for funding HCP to purchase and install its own PV array.

Shared yield and enterprise are the primary foci of this phase, with emphasis on long-term livelihood both for HCP staff and for members of the community who have been collaborating with the site. Older students can learn from the technologies and techniques practiced here, and offer those services to clients elsewhere in the region. The same would go for staff and students' family members, who can take their new skills to new sites and work for pay or for barter.

Phase 3 program elements are diagrammed and described at left. As with Phases 1 & 2, the adjacency diagram on the following page illustrates how elements are connected within the system so as to maximize their conspicuity as visible, healthful, natural cycles in process. Their placement is designed to capitalize on site microclimates as well as the ability of each new element to contribute to and feed off of other elements within the system.

# PHASE 3: OPPORTUNITY

Figure 34. Element Adjacency Diagram



- A** Community work spaces are located next to resource producing elements, such as vegetable plots, fruit and nut trees, and fiber edges. Two are also placed near buildings for access to electricity and water.
  
- B** PV panels are placed on top of buildings for best exposure and connection to the site's electrical systems. Power generated can support school activities as well as community work efforts.
  
- C** Experimental water harvest sites are placed among the olive groves for ease of using an intact but possibly more productive physical structure - olive trees - for collecting water in new ways.
  
- D** Active play space is located next to experimental water harvest systems so that the experiments can be observed in process. Also it is adjacent to fruit trees and a primary walking circuit so as not to isolate this play area.

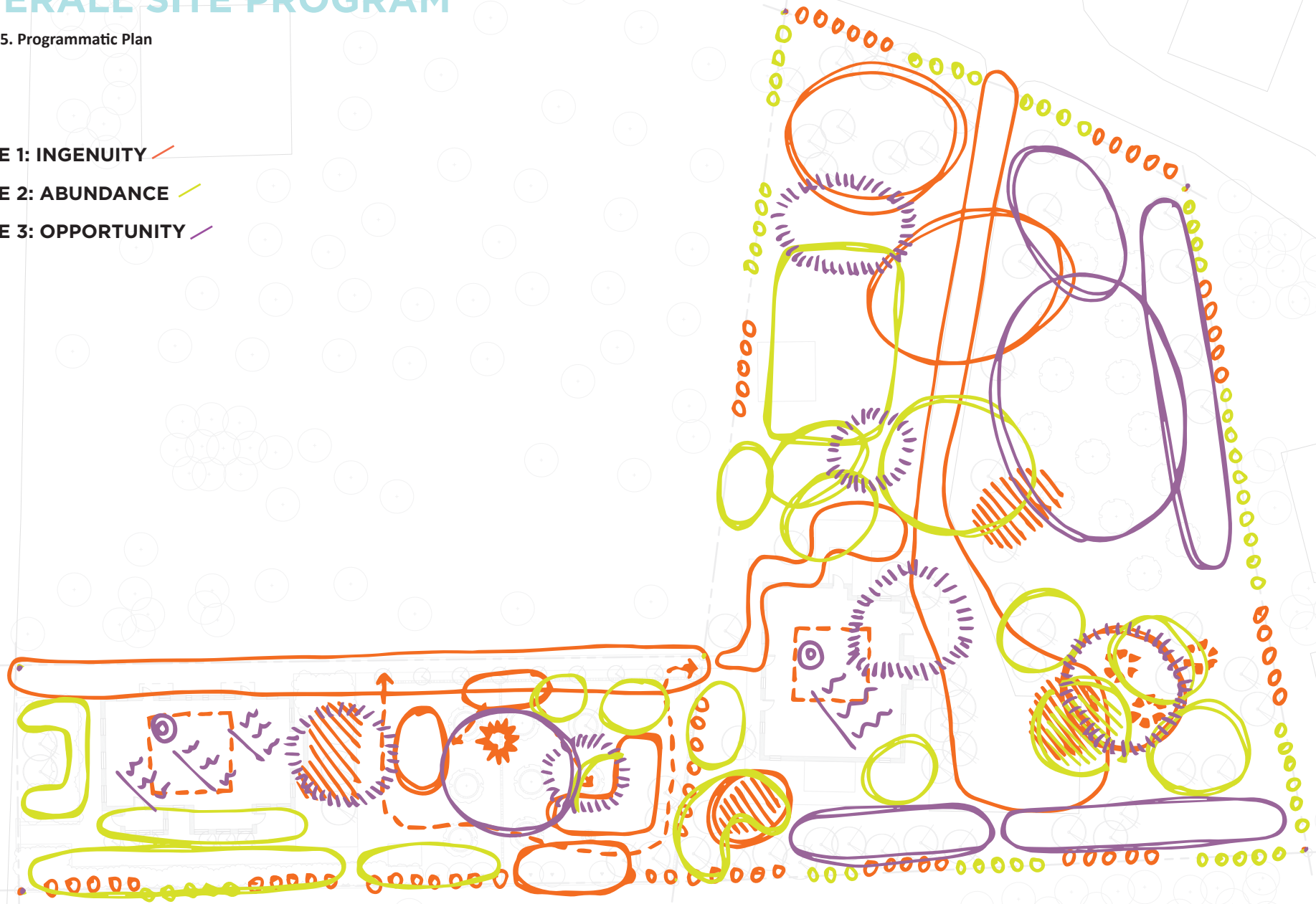
# OVERALL SITE PROGRAM

Figure 35. Programmatic Plan

PHASE 1: INGENUITY 

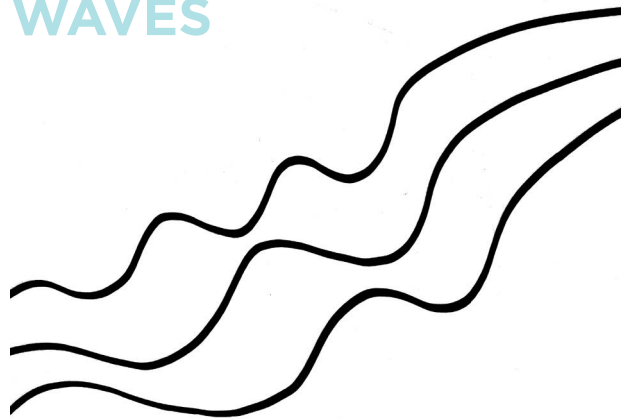
PHASE 2: ABUNDANCE 

PHASE 3: OPPORTUNITY 

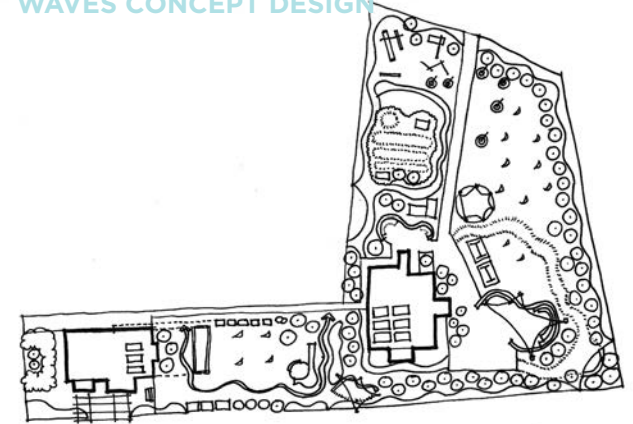


The wave form was discussed in the Design Concept section and returns here to influence the form language used for one of the three schematic options I am proposing in this thesis. The wave undulates, suggests a particular direction and tempo of flow through the site. Forms derived from the wave are organic, with curvilinear edges and soft profiles.

## WAVES

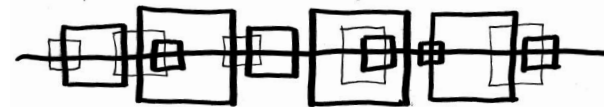


## WAVES CONCEPT DESIGN

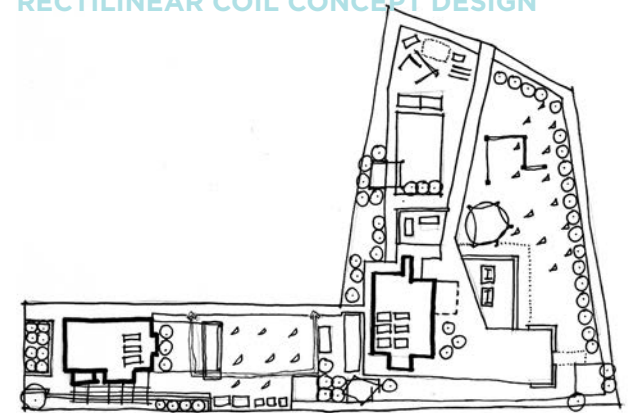


The rectilinear coil converts the coil concept into an orthogonal form, allowing spaces to be dynamic and overlapping while imbuing a formal quality.

## RECTILINEAR COIL

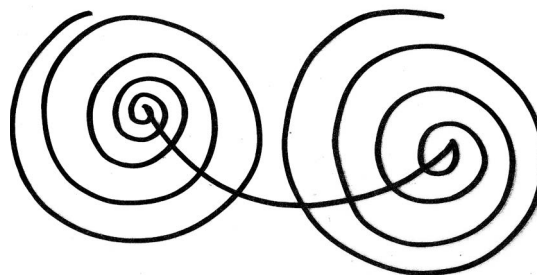


## RECTILINEAR COIL CONCEPT DESIGN



Linked coils refer directly and literally to the concept imagery developed earlier in this thesis. They are linked to show that one healthful cycle influences another. Linked coils manifest their form onsite through circular spaces that overlap in places but also radiate outward from central nodes.

## LINKED COILS



## LINKED COILS CONCEPT DESIGN

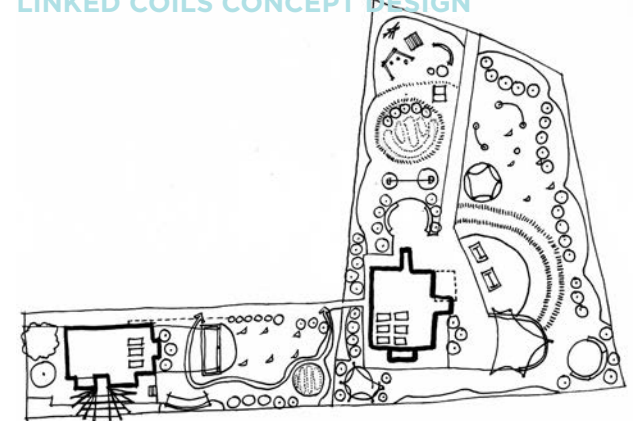
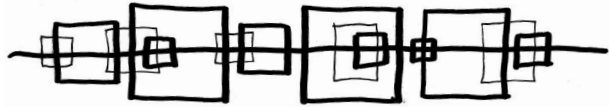


Figure 36. Conceptual Design Options

## PREFERRED SCHEMATIC DESIGN ALTERNATIVE: RECTILINEAR COIL



The form that I chose for this design is the rectilinear coil. While it may not impart the true curvilinear qualities of the coil, it does still show forms that expand and contract as they move across space and over time. There were two driving forces behind my choice of this form. Firstly, the site is already rather angular, and this form fits the language already established here. Secondly, during our April installation of the raised bed and outdoor seating area it became clear that the taste of the Palestinian staff is for symmetry and angular forms. As we designed the raised bed on site, we discussed varying locations and forms, and it was decided that a symmetrical, rectangular bed was ideal for this site.

With this schematic design chosen, I prepared a draft plan of the site, rendered to show how site interventions will sit relative to one another. It is important that I reinforce the nature of these recommendations and this design scheme as a starting place for new conversations with the Holy Child Program community. I have intentionally kept the design as a kind of sketch plan, without more refined imagery that would suggest a final design. This approach is in keeping with the Permaculture model of starting with small and slow solutions.

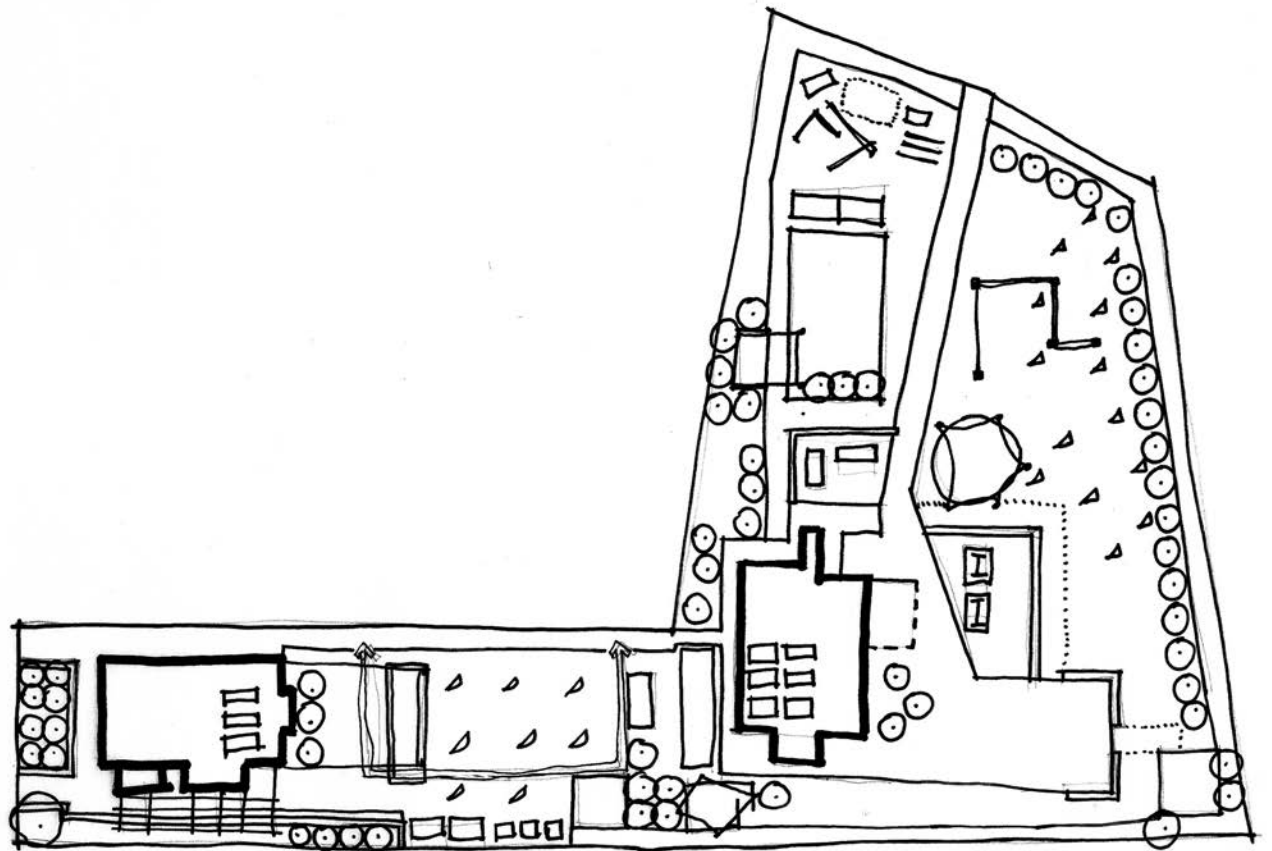


Figure 37. Preferred Schematic Design Alternative



Figure 38. Preferred Schematic Design Alternative - Plan



## Summary

This thesis works through a process of applying a unique set of design frameworks to a site that is ripe for intervention. I have focused on selecting interventions that will aid in bringing greater efficiency, delight, and productivity to this site, as well as those that make natural processes evident in the landscape. The conspicuity of these natural processes is intended to provide visual references of healthful cycles, which are aimed at modeling healthful human behavior.

As I worked through the tasks of weaving together these frameworks I came to understand how complex Permaculture can be. Applying the Permaculture model is no small task, either in writing or in practice. I have a greater appreciation for those who are dedicated to practicing the Permaculture model, as it is holistic in a way that is unparalleled in modern life.

## Challenges

A major challenge for this project is to make clear to readers of this thesis and to the HCP community that the three schematics and the one recommended alternative represent my ideas about what could be, but that the real process of design and installation is yet to be. Everything proposed is open to discussion. We may even decide together to wipe the slate clean and begin fresh. Because the scope of this thesis and the real-life timeline for this project are very different - 18 months vs a decade or more - this thesis simply traces the steps out in front of us, through which I am stepping independently and far away from the actual site, but which we can take together as I visit and work on the site in the coming years. The substance may very well change, but the milestones are laid out for us so that we know where we are heading with each phase of the project.

# CONCLUSION

## How can this thesis be used to move the Holy Child Program forward in developing its site?

My vision for this work is to share it widely, to use it as a point of reference for a conversation with anyone interested in engaging the topics of Permaculture, landscape architecture, community engagement, health, education, productivity, resilience, children, and the productive solutions to the Israel-Palestine conflict. I have posited here an approach to thinking about a site, particularly a site with an abundance of human resources but with very limited financial ones. My hope is that the ideas and vision described here will help motivated site designers and land stewards to seek out the most resilient and restorative design solutions available. I believe that Permaculture offers such an approach, and I look forward to seeing how this model is increasingly applied to bring about sustainable and life-giving collaborations with the land.

## IMAGE CREDITS

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Prelude	Humans of New York, Brandon Stanton, 2014 Banksy's 'Flower Chucker' in Bethlehem, VeraEve Giampietro, 2014
Introduction	Holy Child Program Entry Gate, Gwynedd Rzegocki, 2013
4	Ancient Courses, Mississippi River Commission, 1944
10	Growing Food Onsite at the Holy Child Program, Gwynedd Rzegocki, 2013
Literature Review	Olive Grove Beit Sahour, Gwynedd Rzegocki, 2013
14	Bethlehem Holy Child Program Logo, Bethlehem Holy Child Program, n.d., <a href="http://www.holychildbethlehem.org/">http://www.holychildbethlehem.org/</a>
15	Hospital Staff at Jacqueline Fiske Healing Garden, Jupiter Medical Center, Jupiter, FL, Studio Sprout, 2012 <a href="http://www.healinglandscapes.org/blog/2012/05/happy-national-nurses-week/">http://www.healinglandscapes.org/blog/2012/05/happy-national-nurses-week/</a>
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23	WWI Trench Garden, Germany, © Dean Putney, undated <a href="http://www.dailymail.co.uk/news/article-2386912/World-War-One-German-soldiers-perspective-Hundreds-images-rare-insight-the-Great-War-rarely-see.html">http://www.dailymail.co.uk/news/article-2386912/World-War-One-German-soldiers-perspective-Hundreds-images-rare-insight-the-Great-War-rarely-see.html</a> , Walter Koessler's rare collection of photos
24	Bullock's Permaculture Homestead, Orcas Island, WA, Mighk Simpson, n.d. <a href="http://mighkrophone.wordpress.com/2010/03/07/permaculture-and-climate-change/">http://mighkrophone.wordpress.com/2010/03/07/permaculture-and-climate-change/</a>
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- 42 Greywater Treatment System, VeraEve Giampietro, 2014
- 42 Group Activity in the Garden, L'Abri Facebook Page, n.d.
- 43 L'Abri Coffeeshouse, VeraEve Giampietro, 2014
- 43 Map of Beit Sahour, Google Maps, 2014
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