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[Re]considering the Refugee Camp

Matthew C. Stoub

University of Nebraska - Lincoln, mattstoub@hotmail.com

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[Re]considering the Refugee Camp

Field Manual for the Design of the Settlement for Displaced Persons

By:
Matthew Charles Stoub

A Design Thesis
Presented to the Faculty of
The College of Architecture at the University of Nebraska
In Partial Fulfillment of Requirements
For the Degree of Master Of Architecture
Major: Architecture
Under the Supervision of Professor Mark Hoistad
Lincoln, Nebraska
May, 2007
Abstract:
Conflict and disaster occurs throughout the world every day. The aftermath of these situations gives rise to millions of stateless persons: refugees. Today, the Camp is virtually synonymous with refugee situations. These institutional establishments are intended as a transitory center for sustaining life until the inhabitants can safely return home. The tangible reality of these situations is that they become permanent fixtures in the landscape. The current system of warehousing refugees in overpopulated wastelands creates a strong dependence for the victim upon humanitarian aid. The camp is seen as unwanted, parasitic, and as a necessary evil.

Utilizing a diagrammatical approach this project proposes the design of a new system for the Refugee camp. It focuses on the establishment of planned settlement and becomes a field manual for future situations. From the dependent camp to the self-sufficient community the project evolves to empower the residents.

Primary Objectives:
- Re-thinking the refugee camp by understanding the minimum standards of living and the initial camp establishment. The project critically questions the current attitudes towards refugees and the creation of camp establishment. Research into the current standards provides a departure point for the project as the new system will still be deployed by relief organizations.
- Re-humanize the inhabitants through the introduction of new program that empowers the individual and alters the public perceptions of the camp. When you consider the typical camp situation, persons become dependent on the aid they receive for many reasons. This project introduces re-humanizing components into the design for the purpose of sustainability and self-sufficiency.
- Creation of a permanent settlement based on an evolutionary process of design from transience into permanence. Facilitates the evolution of a camp into a settlement. The settlement is not a static environment. Planners frequently design static environments of permanence. The design for the new settlement facilitates change and is ordered around an understanding of control as it relates to circulation and boundary.

[ Content ]

The Protracted Refugee
Research Paper of the political/social shortcomings of the established system

Established Practices
Research and Analysis of the global refugee situation and the current standards of aid

Diagrammatic Organization
Conceptual ideology in the camp / settlement system

Design Manual:
Trancending the camp over time through diagrammatic phased development
The neighborhood
The settlement
Multiple settlement system

Bibliography / Acknowledgements
Relevant Sources and Dedications

Appendix
Early camp and neighborhood studies.
The Protracted Refugee Camps - As Places of Permanence and Deterioration: A New Model

Abstract:

Today, camps are virtually synonymous with the refugee experience. These camps were not designed in 1951 with the explicit intention of providing a site for people to be decently, self-sufficiently, and individually cared for. They exist as transitional zones. They are not intended for long-term, permanent residence. The authors argue that the current understanding of what constitutes a refugee does not fit the reality of protracted situations.

The 1951 Refugee Convention was a new approach to establish rights for stateless people in an explicitly and implicitly Eurocentric Europe. The conventional model of a refugee was based on a state of protection that would arise from an ad hoc political decision. This model did not recognize the right of refugees to live, to work, to have access to education, and to seek asylum in the host country. The Convention failed to break from the imagined geopolitical landscape on which the basic premises of asylum were founded.

The limited definition has not been expanded. Hathaway points out “[T]hose who, not having a nationality and being outside the country of his former habitual residence, are unable to return to it, because of fear of persecution, are not included in the definition of the refugee established by these conventions.” This is actually preferred by most host countries. They argue that refugees responsible for their asylum because they do not fit in the Convention’s definition of a refugee. They seek to limit the right to asylum to those who are victims of persecution and are unwilling to return to the country of origin because of this. As today’s displaced peoples face violence for reasons other than persecution, this definition puts a group of people at risk of being refused asylum.

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The current warehousing camp establishments are justified by host populations for many reasons. One excuse is the belief of it as a transitory camp. But when nearly two thirds of the entire population in refugee situations exist in protracted situations it is clear that this defense is refutable.

Camps are frequently located in ‘invisible’ parts of the host state. They are sited far from economic and urban centers on undesirable lands with typically poor climatic conditions. Movement in or out of the camps is restricted preventing refugees from establishing agricultural and economic possibilities. This restriction reflects a form of ghetto phenomenon. The paradox created is that ghettos are a purely urban feature which only strengthens the notion of its permanence. Security in and around protracted camps is one primary concern. Crisp studied two well known camps in Kenya (Kakuma and Dadaab) and found that violence assumed a variety of forms: domestic, community, sexual, robbery, violence between and within national refugee groups, and violence between and within national refugee groups. One contributing factor to the violence is the lack of lawful protection provided. In the case of Kakuma and Dadaab, the Kenyan government doesn’t recognize the inhabitants as refugees because of their ‘transitional nature’ (though both have existed for over a decade), rendering them stateless areas, and therefore it does not protect the residents under their judicial law. In a horrific example, Kenyan Security Forces were noted as responding to a report of rape, “You are raping our trees, so you got what you deserved.”11 The lack of freedom of movement, the scarcity of economic and educational activities, and the inability to see a way out of their situation all contribute to the violence prevalent in camp life.12

As protracted situations drag on, resentment of the process of humanitarianism at the hands of the UNHCR and other reputable NGOs the development of another refugee camp. The proposal is for the development of a settlement for displacement. This section of the paper has demonstrated the ‘refugee camp’ as the dehumanizing process. In effect, the agencies are inadvertently contributing to the individual’s deterioration of identity. In some refugee situations, protracted inhabitants of camps venture beyond their borders and begin to develop illegal agriculture. Frequently this attempt makes ends meet they will engage in unsustainable farming techniques that reduce yield quantity and quality over time that creates a need for additional land resources.13

Jeff Crisp, p. 7.

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Established Practices

The unique nature of this project requires it not to be site-specific. The project suggests guidelines to deal with certain climate conditions and accepts variations that will undoubtedly occur. It is intended as a diagrammatic Field Manual for establishing the refugee camp that becomes a settlement.
The following 3 pages of the Field Manual break down the current strategy for providing aid in crisis situations and establishing the refugee camp. The Handbook for Emergencies is a manual put out by the United Nation High Commissioner for Refugees (UNHCR) that details the programmatic requirements of different spaces in the camp including where they can exist in relation to each other. The Sphere Project’s Humanitarian Charter and Minimum Standards in Disaster Response is another handbook aimed at providing more guidelines into the design for Refugees [UNHCR] that details the programmatic requirements of different spaces in the camp including where they can exist in relation to each other. The Sphere Project’s Humanitarian Charter and Minimum Standards in Disaster Response is another handbook aimed at providing more guidelines into the design for the refugee camp. Both of these manuals were analyzed and their programmatic features were highlighted and broken down into an organizational chart.

This chart was used in the design process to set up the base camp. The intention of this settlement is that it will still be established by the UNHCR or an Non-Governmental Agency in a similar fashion to the current standards in the initial phase. These standards offer minimum goals of design in the project that must be met to ensure that they are met. Included in the base design of the new system is the prepackaged container with essential immediate supplies that can be delivered quickly to any location in the world. Each camp will require 32 Cargo Containers filled with the basic emergency kit to be deployed on site. These base kits supply enough emergency food rations for 1 week and essential immediate supplies that can be delivered quickly to any location in the world. Each camp will require 32 Cargo Containers filled with the basic emergency kit to be deployed on site. These base kits supply enough emergency food rations for 1 week and basic sanitary / household items for at least 1 month. These kits should be available in storage and ready for deployment whenever a disaster or conflict occurs. Airplanes and trucks already on standby with the UNHCR will be mobilized to transport the containers.

- The new system limits the camp size to 10,000 people initially. This allows there to be an adequate level of safety and a manageable level of supply into the camp. If more than 10,000 people are seeking refuge, multiple camps should be utilized.
These diagrams demonstrate the UNCHR’s attempt to humanize the refugees in the eyes of the world. Ironically, they chose Lego people which in effect dehumanizes the victims. On the opposite page, these diagrams represent the extent of current refugee camp design. This manual will provide a new system that goes beyond these undersized spaces.

Camp: Approximately 20,000 inhabitants
- 4 Sectors
- fire breaks: 30 m per built-up 300 m
- Roads follow contours and lead out from center
- Run-off water also follows contours
- Features used to break repeating pattern
- Administrative centre locate at the center of the camp.

Sector: approximately 5,000 inhabitants
- 4 blocks
- fire breaks: 15 m between blocks
- Should contain central recreational/commercial space
- Block: approximately 1,250 inhabitants
- 16 communities
- Fire breaks: 6 m (pathways)

Community: approximately 80 inhabitants
- 16 plots with 16 shelters
- Fire breaks: 2 m between dwellings
- Drainage should be well planned and maintained
- Drain water must not pollute existing surface water or groundwater, or cause erosion.

LEGEND:
- Latrine
- Shower
- Tap Stand
- Refuse Container
- Road/Surface Drainage
- Family Dwelling On Family Plot

Option A
Option B
Option C
Current refugee camps are poorly designed and become a sea of tents. By only following the minimum standards established by the previously mentioned guidebooks, camps become these dense places of impermanence. The goal of the settlement for displaced persons is to provide the individuals with a sense of ownership and opportunity. Spaces should be allocated for agriculture as well as distinct locations of community spaces. Individual neighborhoods should be clearly defined in a smaller more intimate scale.
Diagrammatic Organization

The diagrams on the following 10 pages conceptually define the organizational structure of the settlement system. These diagrams should be referenced for clarifications of the Neighborhood / Camp / Multiple Camp Plans.
In order for the settlement to begin the process of establishing agriculture in order to sustain itself, adequate soil must be produced. Since the camps are generally located in border wastelands, creating nutrient-laden compost will be utilized in the system. Human Waste products break down [micro-organisms digest it in about a year utilizing this system] into a humus-like earthy material that is perfect for use in agricultural systems. There are a variety of these systems available including the CTS composting system (shown here).

Care must be used when harvesting the usable compost and trained staff should be present in order to verify when compost is ready. Initially, individual systems can be utilized between the neighborhoods as more compost will be needed than produced during the establishment of the agricultural system. As permanent infrastructures are developed, see the Overall Settlement Plan for the development of the locations of the permanent large-scale operation. The large scale operation is a centralized system and will provide compost to all parts of the settlement.

Baffle walls and air channels allow microorganisms to decompose the accumulating organic materials. Heat and moisture-laden air are carried out the ventilation stack. The process produces no methane gas. 90% of the volume is eliminated by decomposition and evaporation as it moves down the sloping floor. Each Community Cluster [100 People]

<table>
<thead>
<tr>
<th>6 Toilets / Cluster Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.6 Daily Average Uses / Person / Day</td>
</tr>
</tbody>
</table>

These diagrams demonstrate the new settlement intentions. Beginning as the modular unit that is quick to deploy the camp grows into a settlement that is capable of sustaining itself. In the end transcending the aid agency that initially supports it. The process highlights two of the most important components of the system, the agriculture and the marketplace. These two pieces of the program are critical to the success of the settlement on the whole. They represent a form of independence and economy that is rising from the current refugee system. By encouraging these programs the process of establishing permanence and identity can begin.
- The proposed settlement for displaced persons is completely dependent upon the establishment of the agricultural system and the food produced. Without a fully functioning agricultural system the inhabitants can never fully sustain themselves and transcend the aid agency. The system proposed here is to use No-till bio-intensive farming practices. This method of farming can increase crop yield by 2 to 6 times that of conventional farming practices. To achieve maximum results it is recommended that Double-dug raised beds be used by mixing the composted human waste with the soil. However, this is a very labor intensive task.

- The network run by Ken Hargesheimer [online at Minifarms.com] was the primary source of information about this farming system. This system has been utilized in many parts of the world with different climates [Including South America and Africa] and has had profound success.

- Under the system, each family is allotted a spatial allotment, the family should be able to ultimately produce over one and a half times what they will require to eat in one year. Comparatively, in the United States, highly mechanized farming systems would require 22,000-42,000 SF to achieve the same results.

- Each plot of land is divided up into 20 individual agricultural beds that measure 5' X 48'. Using a drip line irrigation system, 10 gallons of water daily is all that is required to irrigate the land. Maintaining a 5 foot wide bed is crucial so that an individual is able to reach the center of the bed from the aisle on either side. The aisles should be 3 feet wide in order for a person to navigate tools (such as a wheelbarrow) within each plot.

- Crops that are indigenous to either people working the land or the region in which the settlement is located should be selected. Consult the website for specific crop recommendations. A variety of crop types should be used to create a balanced high calorie diet for the inhabitants.

Las Vegas, Nevada is currently one of the fastest growing cities in the United States. Its development represents the current growth trends found across the country. The population density of Las Vegas is 4,222 people/mi squared. When comparing the proposed settlement of displaced persons to that of Las Vegas, the design calls for a density level that is nearly two times that of the current American growth trends. In a space that is 1 mile by 2 miles where 8,444 people are living in Las Vegas, 16,000 people could live including the space needed for the settlement to meet and ultimately exceed 100% of its agricultural needs.
Timeline utilizes 40 Births / 1000 population which is the average in the gaza strip where 25% of warehoused refugees reside.

Average yearly birth rates in the settlement can help predict the time and quantity of additional neighborhoods that must be added to the settlement over time.

Each individual owns 160 sf
Each individual shares 118 sf
Each person enjoys 278 sf [ + circulation / open space ]

Plot Size And Layout Criteria:
- Firebreak Must Be 2X Height Of The Tent
- Allow For Permanent Residence To Be Built Around The Tent.

<table>
<thead>
<tr>
<th>Housing</th>
<th>Hygiene</th>
<th>Waste</th>
<th>Health</th>
<th>Cooking</th>
</tr>
</thead>
<tbody>
<tr>
<td>16000 SF</td>
<td>4000 SF</td>
<td>1250 SF</td>
<td>100 SF</td>
<td>600 SF</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Organization</th>
<th>Owned program</th>
<th>Shared program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hygiene</td>
<td>waste</td>
<td>Cooking</td>
</tr>
<tr>
<td>Health</td>
<td>health</td>
<td>cleaning</td>
</tr>
<tr>
<td>Food</td>
<td>Athletic</td>
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</tr>
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</tr>
</tbody>
</table>

2X Tent Height
1,146,096.000 sf total for 400 people
0.041110537 square miles for 400 people

100 people live in each community cluster
4 community clusters comprise 1 neighborhood

Where the urban and rural unite

3,022 people / square mile in Lincoln, NE
4,154 people / square mile in Las Vegas, NV
12,705 people / square mile in city of Chicago.
15,011 people / square mile in city of Tokyo.
26,403 people / square mile in New York City.
8,000 people / square mile in the proposed Settlement for Displaced Persons including 100% of Agricultural Needs

The aid agency [ U.N.H.C.R. ] negotiates land with the host country for establishment and growth of the camp into a settlement. The camp is founded on the Roman Camp strategy of the Cardo and Decumanus

Neighborhood strips provide a buffer of protection from outside dangers to the settlement’s agricultural system.
Shifting the neighborhoods creates a bastion defense which allows residents to see potential threats that may approach. This creates internal community spaces.

Vehicular traffic is deflected or moves around the perimeter of the camp while pedestrian movement is direct and internal.

The system allows for population growth and expansion over time before reaching max. capacity for the 1 x 2 mile land allocation.

Most refugee situations result in >10,000 people seeking asylum. Though the camp is designed to only handle 10,000, multiple camps can be located in proximity and begin to interact together.
The following section of the manual diagrammatically maps out the transitional growth from the initial camp into the sustained settlement. Utilizing 3 scales the diagrams map out the design of the system.

The Neighborhood
The Settlement
Multiple Settlement System
This diagrammatic timeline represents a model from which the camp evolution into a settlement may follow. The rate at which the major catalysts defined in the test may fluctuate depending upon local variables including birth rates and migration/emigration into the camp. An average birthrate of 42 births/1000 people was utilized in the timeline as that is the average birthrate estimated in Gaza Strip where 25% of the warehoused refugees in the world reside today. The timeline is intended to serve as a guideline for reasonable expectations in the survival aspects of the timeline represent a settlement is dependent upon the inhabitants themselves and their willingness to continually improve their conditions. The built environment outlines the phased growth and implementation of permanent buildings. Additional schools and community centers should follow the growth in population whether it occurs at a rate faster or slower than outlined in the above diagram.

Key:
- People Begin Arriving
- Registration Center
- Tent Shelter
- Food Preparation Expansion
- Reference to Core Community
- Reference to Fixed Housing
- Reference to Aided Refugess
- Reference to Municipal
- Reference to Permanent Structures
- Reference to Agriculture System
- Reference to Agricultural Compost
- Reference to Water Infrastructure Redevelopment
- Reference to Permanent Human Waste Disposal
- Reference to Human Waste Disposal Infrastructure
- Reference to Food Distribution Center
- Reference to Food Preparation Infrastructure
- Host Negotiation
- Site Selection
- Site Manipulation
- Recreation Spaces

Timeline Growth:
- In the initial phase of the post disaster situation, the aid agency negotiates a 1 mile by 2 mile plot of land per camp of population 10,000. As soon as possible, people begin to arrive at the camp with established base infrastructural systems. At this point in time, the camp inhabitants are 100% dependent on the aid agency for food and basic services.
- At month 6, fixed housing and infrastructure is established. At this point, the agricultural system should be ready to be worked into the soil as a nutrient based compost. At this point the agricultural system is initiated. As month 36, fixed housing and infrastructure are bought/sold/traded by inhabitants of the settlement. Their agricultural system should have the capacity of sustaining itself without outside assistance. Their agricultural system should the fully established to support themselves and the marketplace takes over the distribution of food.
- By month 80, the settlement can have the capacity of sustaining itself without outside assistance. Their agricultural system should have the capacity to exceed the needs of the users by month 144. A surplus supply should be traded within the camp or potentially exported for sale to the host country. The settlement also expands to meet the needs of the growing population within its borders.
- By month 80, the settlement can have the capacity of sustaining itself without outside assistance. Their agricultural system should have the capacity to exceed the needs of the users by month 144. A surplus supply should be traded within the camp or potentially exported for sale to the host country. The settlement also expands to meet the needs of the growing population within its borders.

Timeline:
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- Reference to Aided Refugess
- Reference to Municipal
- Reference to Permanent Structures
- Reference to Agriculture System
- Reference to Agricultural Compost
- Reference to Water Infrastructure Redevelopment
- Reference to Permanent Human Waste Disposal
- Reference to Human Waste Disposal Infrastructure
- Reference to Food Distribution Center
- Reference to Food Preparation Infrastructure
- Host Negotiation
- Site Selection
- Site Manipulation
- Recreation Spaces

Timeline:
- In the initial phase of the post disaster situation, the aid agency negotiates a 1 mile by 2 mile plot of land per camp of population 10,000. As soon as possible, people begin to arrive at the camp with established base infrastructural systems. At this point in time, the camp inhabitants are 100% dependent on the aid agency for food and basic services.
- At month 6, fixed housing and infrastructure is established. At this point, the agricultural system should be ready to be worked into the soil as a nutrient based compost. At this point the agricultural system is initiated. As month 36, fixed housing and infrastructure are bought/sold/traded by inhabitants of the settlement. Their agricultural system should have the capacity of sustaining itself without outside assistance. Their agricultural system should have the capacity to exceed the needs of the users by month 144. A surplus supply should be traded within the camp or potentially exported for sale to the host country. The settlement also expands to meet the needs of the growing population within its borders.
- By month 80, the settlement can have the capacity of sustaining itself without outside assistance. Their agricultural system should have the capacity to exceed the needs of the users by month 144. A surplus supply should be traded within the camp or potentially exported for sale to the host country. The settlement also expands to meet the needs of the growing population within its borders.

Average population growth:
- By average population growth, the 144th month the settlement will reach its maximum capacity for the 1 mile by 2 mile negotiated border. This may happen at different times depending on the immigration/emigration of maximum population for the 1.2 mile stretch is 16,000 people and should not be exceeded.
Land Berms: provide a neighborhood boundary acting also as a protective wall to replace razor wired fences.

Hygiene Units: Tanks are partially buried and soil mounded up to drain water around the human waste units.

Pedestrian Green Strips: interconnect throughout the camp and serve as neighborhood gathering space.

Central Court Space: slopes gradually to the roadside [Slope is greater than 2% and less than 10%].

Fields: slope gradually from the center aisle to the roadside. Water drains naturally providing basic irrigation.

Site Manipulation must be done immediately after reaching an agreement with a host country for a site. Earthmovers should create land berms and a slope for drainage. Desired slope is greater than 2% for proper drainage and less than 10% to prevent erosion. A goal of 6% is preferable. The berms are each 20’ wide by 208’ long with a desired height of 6’. This diagram shows approximately how water drainage should occur. Slight variances based on site conditions may apply.
Water Taps provide access to running water for the neighborhood. Site specific conditions will determine the type of water source.

Individual Shelters are part of the base emergency kit delivered to the site. Specific model will vary by climate.

Base Waste Disposal Containers are located near the service road for disposal.

Base Health Units [Water Closets] are located near the service drive to be emptied into compost storage containers for use in agriculture.

Base Cooking Units serve as community kitchens and are manufactured units brought into the site.

Base Hygiene Units are used for general washing / bathing in the community.

Cargo Containers with the base emergency kits for 400 people are deployed.

Agricultural Plots laid out per the agricultural diagram on field manual page 21.

Each neighborhood is broken up into 4 community clusters. One cargo container deployed to the site will provide the base emergency kits for 400 people [100 people / cluster]. It should be dropped centrally in the camp as indicated on the plan. This container can be used as a storage unit or shaded space for the community. The housing in the clusters are laid out around a central space that serves as a community kitchen/eating space and play area for children.

Water Taps: Four individual taps should each flow at 250 ounces of water per minute. The location of the camp will determine what type of water infrastructure should be established. Wells / Large Storage Tanks (to be filled by aid agency) / direct connection to local system / AirWater Machine (Solar Powered Villager Unit)

Individual Shelters, part of the emergency kit should each be sized to hold a minimum of 5 persons. Climatic conditions found in the settlement region should dictate which model of tent is to be utilized. An all seasons weather tent should be used in areas where climate ranges from extreme heat to extreme cold. Designed to last 3-5 years, these tents should only be used as a temporary solution.

Base Waste Disposal Containers: Two 26 gallon containers should be set up in each cluster near the road for easy removal. Aid agencies should negotiate a place for garbage disposal with the host country in either an off camp pit or dump. Recyclable goods (including food scraps) should be added to the compost piles, though care should be used in covering the piles to keep rodents and animals away. Construction of the piles should be overseen by the aid agency staff to make sure they are able to be properly sealed.

Base Health Units: Tanks should be emptied periodically as needed, varying cluster to cluster by use. Only the digested soil should be removed. These initial closets should be constructed of available adequate material. While plastic sheeting may be utilized, construction of more permanent structures should be considered a priority. Each unit should provide some access to sanitizing hand soap for proper hygiene care.

Base Cooking Units: These modular units should be deployed centrally within each cluster as quickly as possible. Portable solar cookers can be used in most areas initially before the modular unit is deployed. When available, camp stoves and other cooking mechanisms can be used initially.

Base Hygiene Units: Temporary structures should be assembled to provide bathing opportunities for residents in custom with their indigenous preference. A washing tub for any dishes and hands should be included as well. These structures are to be assembled on a poured concrete pad measuring 33’ x 38’ that the permanent infrastructure can be built upon. This phase should occur by the month 2.
In the second phase of the process, permanent infrastructures are introduced into the system. Exterior walls are built to define a boundary for each cluster. The advantage to this growth system is that the external and shared party walls between the individual units can be built around the tents. This prevents the inhabitants from being required to relocate while they build a permanent home. The permanent health and waste units are to be built where the previous existed as well. The Water Closets should be segregated by sex. There should be six individual toilet units per community cluster. In addition, a permanent waste disposal unit should be implemented into the settlement, located adjacent to the turnarounds for easy disposal. If possible, the settlement should begin to develop a permanent water infrastructural system that provides water directly to the community kitchen and taps out to the fields to limit the carrying distance for irrigation and food preparation. Recycled human waste that is ready to be utilized in the agricultural system should be worked into the soil and construction of the 5’ by 48’ beds should begin. At this point in time, people should begin to understand a sense of ownership and independence as they actively participate in the development of the system. This phase should be obtained by month 36.
Paths based on the movements of people through the space should be, when appropriate paved with some sort of available material. This increases the permanence of the settlement.

Landscaping appropriate with the natural environment should be implemented to provide shade from the sun. In addition, landscape in the green strip provides a park-like environment for people to dwell in. Landscaping can also be used to block unsightly views to objects such as the Health and Waste Disposal Units.

Community Kitchen expansion should be completed to meet any additional cooking / eating spatial requirements that the population may have. The users should actively participate in the design and construction of these improvements. This should help create a unique identity within each cluster.

Now that the agricultural system is developed and the settlement produces more compost than is required the compost is removed and taken to central processing plants for use in other areas of the camp such as the schools and athletic fields. This phase should be obtained by month 60.

Permanent Housing is completed. Offsets to the housing allows the incorporation of the window module units on either the front or side of the residence. See manual pages 55-56 for information regarding these window module units.

Paths created by peoples movements can be paved if materials are available.

Landscaping should be planted in the green strips and within the cluster in order to provide shade.

Community Kitchen expansion to meet the growing needs of the population.

Agricultural System should be able to provide 100% of nutritional needs.

Pathways based on the movements of people through the space should be, when appropriate paved with some sort of available material. This increases the permanence of the settlement.
The Established Camp: Tents are set up according to the specified guidelines. Basic infrastructures have been established providing temporary structures for persons to inhabit.

The permanent infrastructures have been assembled using available materials. Outer wall construction has begun including the walls around the permanent hygiene unit.

Shared party walls have been assembled. This example demonstrates a simple span sloping roof system.

After construction of the permanent front walls around them, inhabitants can break down their tents to use as temporary roofs until adequate materials are located.

Additions have been made to the kitchen unit based on participatory design and construction by the residents.

Roofs complete the construction of each cluster. Landscape has been added to provide shade to the community spaces. At this point, the settlement has erased its memory as a minimal camp as the residents are able to fully support themselves.
The design of the camp is founded on the principles of Roman camp strategy utilizing a cardo and decumanus. In Roman towns, the cardo served as the center of economic life. In the first phase of the new strategy, the cardo holds its importance as the Distribution Center, Health Clinic, and Central Services are located along this axis in the middle of the camp. These services should be designed per current standards already set forth by the UNHCR Handbook. The decumanus, the central horizontal path in the plan to the left serves as a secondary route through the camp. It diverts around the school and central service zones which slows down the vehicular movement on it. The neighborhoods are laid out on two strips on either side of the camp. These zones frame in the central agricultural zone. This is done to provide a buffer between outside threats and the agriculture. In many current situations, outsiders whom resent the refugees and the aid they are receiving have been known to burn and destroy the established farming (usually illegal in the current system as no land is provided for agricultural development). By internalizing the agriculture, the design creates a level of protection for this vital development resource. The perimeter of the camp is created by shifting neighborhoods out from the center. This is to be done for two primary reasons. First, the perimeter begins to mimic a bastion defense system, similar to exterior defense walls found in castles. This allows residents of the neighbor-}

hoods to see approaching dangers as well as controlling potential points of attack. The second reason for the shifts is to create the central school zones. This establishes an educational facility in the heart of the camp as well as large athletic fields where residents can gather for competitive and leisure sporting activities. The schools system is broken into morning and afternoon sessions. This contributes to the decision to locate them centrally. It allows close access to the fields where the majority will be assisting their families in agricultural production. The number of classrooms and schools should follow the guidelines set forth for educational facilities on page 12 of this manual. Firebreaks, as highlighted above should be included in the layout of the camp. Community and Spiritual Centers located near the neighborhoods should be located within these spaces. The firebreaks provide a strong pedestrian access from the perimeter of the camp to the interior. Locating the community and spiritual centers near allows easy access for residents all over the camp.

The diagrams on pages 26-28 highlight the conceptual ideologies that are set forth in the design of the overall camp. These diagrams should be reference when laying it out.
At this point of the transition from camp into permanent settlement, the agricultural system is well established. After the population reaches 12,000 people, the settlement begins to expand to fill in its borders (1 mile by 2 mile limit). At this point, the permanent infrastructure is fairly well developed. The first aspect of expansion per the timeline established in this manual should begin with additional school and community centers. The central services area is replaced with the central business district as the settlement establishes its economy. The former service zone is intended to be converted into a central parkscape at the nexus of the cardo and decumanus. The settlement’s road infrastructural system is better defined between the vehicular and pedestrian paths. The pedestrian green strips that link the major services should begin to be landscaped. This phase should be obtained by month 78.
In this third (and final planned) stage of growth the settlement has grown to reach its border. At this point, additional growth will be dependent upon the spaces framed by multiple camps growing together. This system is defined in the multiple camp system outlined on pages 53-54. The composting system has been moved to centralized locations on either end of the camp along the decumanus. This move suggests that in the 1 mile squared spaces framed in might be encouraged to continue an increased agricultural system. The diagrams above demonstrate how the internal aspects of the camp remain pedestrian dominated while the vehicular movement is limited to the exterior, the cardo, and along the decumanus. The maximum population in this individual settlement is limited to 16,000. This occurs around the 144th month.
School buildings are composed of at least three classrooms. Designs of these buildings should be done with the help of the inhabitants.

The plan on the opposite page shows the school and community fields area of the camp. The above image is a representation of what the community fields may look like upon development. These fields become a gathering place for all of the neighborhoods to enjoy competitive sport.
This module unit is intended to provide computer access to the educational facilities of the settlement. The new system calls for a blend between indigenous design and technological advancements.
Each settlement has a maximum population of 16,000 (10,000 initially) people in its 1 mile by 2 mile site. The reality of refugee situations is that greater than 10,000 people will be seeking asylum. The solution to this is to create multiple camps that can grow into settlements. This section of the manual offers a system by which multiple camps can be located in proximity to each other and ultimately grow together. The above diagram was created by connecting the cardos of four camps. Next, repeating this pattern creates an alternative grid that can be superimposed on a site. This system lays out the potential locations of each camps cardo. To the right, the diagrams demonstrate how when four camps reach their maximum size (1 mile by 2 mile), they frame in a space. This space is either one square mile or four square miles. The notion of this design is that they can take control of this land and transcend the system this manual has laid out. Just as the residents transcended the aid agency to take control of their situations, these settlements can take control of their expansion and continued development.

[Multiple Settlement Growth]
These modular window units can be packed into a cargo container and delivered to the settlement. Each container holds enough windows for all residences in a neighborhood (80 residences) to be allotted two windows. The units themselves are designed to fit in a 3' by 6' opening. The windows have a reflective opening to help light bounce into the household and penetrate further. The entire unit also pivots out to allow maximum solar collection if desired. Each window’s slats can be adjusted in a variety of positions from completely open to completely closed to allow desired levels of airflow into the house.


Ecology Action: A Sustainable Solution to Growing Food: available online at: http://www.growbiointensive.org/


Hargreaves, Ken. Personal Correspondence and Minifarms Network online at: http://www.minifarms.com/


The following books, papers, and organizations were used in the research of this project:

- Ecology Action: A Sustainable Solution to Growing Food: available online at: http://www.growbiointensive.org/
- Hargreaves, Ken. Personal Correspondence and Minifarms Network online at: http://www.minifarms.com/


The Human Art Handbook: available online at http://weblife.org/humanure/

UNHCR Global Consultations on International Protection, 4th Meeting, "Local Integration." EC/02/02/6, April 25, 2002.


[ acknowledgements ]

Critique Crew:
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A special thanks to professor Mark Holstad, mentor throughout this past year. Your willingness to let me explore a non-traditional project and guidance throughout the process has proven itself invaluable.
The appendix shows a variety of early explorations that helped influence the final design of the neighborhood and settlement growth patterns.

The following 6 pages show an early study of human movement patterns through the camp as it developed. The camps are imposed on an artificial site generated with random integers to show how the communities may grow along the contours of the site. New programs created new movement patterns in the space. This process helped understand how people would use the space and lessons learned were incorporated into the final settlement design.

Diagram Above: After initial deployment, the camp exists in its dependent state. The dashed lines converging on the central distribution center represent human movement through the site. From this central location the refugees can access humanitarian aid. This flow acts as the lifeline of the camp.

Diagram Above: In the second stage schools and community centers are introduced to the site. Two schools (1 for each sector) share a recreational field which is located between opposite sides of the settlement to encourage gathering and sport amongst the residents. Flows of movement are again mapped onto the site. The movements are arterial in nature, based on natural human movement tendencies. The community centers were then placed between 4 clusters where two major intersections of flow occur.
In the third stage, agriculture (made possible by the composted waste) is introduced to the system. It grows out from the edges beginning with the land nearest to the compost bins and the water taps. Secondary lines of movement toward the school campuses are interrupted by the fields while the primary lines maintain their dominant status. The secondary flows are diverted to flow between the fields along their access ways whose primary function is to provide access for hauling compost, harvested crops, and water. A marketplace is also established near the distribution center along the primary lines of human movement. A zone is set up above and below to allow for urban expansion.

The fourth stage reveals the central agriculture at full capacity. The primary flows still exist and provide access to the entire settlement for the population. The Decumanus flows around the schools and between the fields, providing the farmer a direct right of way to bring his harvest to the market for sale.

[ Appendix ]
Water Sources are centrally located between four community clusters along the axis road. Based upon the distances required between different programmatic elements the ordered spaces are created.

These lines represent lines of movement: the flow of people through the spaces based on both primary and secondary routes. The dark linear lines demonstrate the lack of community between each cluster as flow moves freely between the spaces.

While still maintaining order, tents are shifted towards the upper and lower borders. This simple shift allows the cluster to solidify its borders while creating a small node near the Food Preparation. This space can be utilized for eating and small community gatherings.

Moving the tent structures to strengthen the edge condition and offsetting the internal tents breaks the direct flow of outsiders into the cluster. The internal flow of residents into and through their cluster is more often and the movement softened.
These diagrammatic developments over time were alternative neighborhood plans explored early in the timeline development. Each one was evaluated and the positive design features were used in the neighborhood dictated by the manual. They are shown here as possible alternatives.
The following 3 pages show a phase of the development was done to look at how unplanned growth might take place in the camp. Based on locating program near and along pedestrian routes that become roads it investigates how likely growth patterns may take form. This was used in the final design as a locator of program and movement through the site.
The diagram above shows the road infrastructural system of the camp.