

Project NOAHouses
Floating Refugee-Arks
Clients: 20.000 Persons
Capital Requirement: 2.200.000€

 Initial Capacity: 5.000 persons
 Phase 1 & Phase 2

The initial capital includes the purchase of property/land as seen in Table 1. There is currently a property under discussion as to terms with the property-owner, with one building already established on said property. Phase 1 primary goal is purchasing property, acquiring a 3D printer (Table 1), and the construction of the base-camp infrastructure. These infrastructure-buildings will be 3D printed from a detoxified inflammable plastic, serving also as prototypes for Phase 2 and marketing/funding purposes.

| Phase 1: Base Camp | | | |
|---|--------------|--------------|-----------------|
| Location: Samos, Greece Plot size: 2.396,65 sqm (Buildable 759,82 sqm) | | | |
| Property | 100€ / sqm | 2400 sqm | 250.000€ |
| Basecamp Infrastructure | 10 Buildings | 750 sqm | 250.000€ |
| 3D Printer Modex Mama | 7m x 14m | | 25.000€ |
| Communications | Crew | | 25.000€ |
| Transportation | Crew | | 50.000€ |
| Unforeseen Expenses | | | 100.000€ |
| | | | |
| | | Total | 700.000€ |

Table 1 - Phase 1 Financial

Phase 1 and Phase 2 timelines should overlap, with Phase 2 beginning upon purchase/rental of property on Samos. In order to ensure the well-being of the people moving into the NOAHouse settlement the base-camp infrastructure must be finished. Human services as to education, medical, sanitation, food, water, etc. must also be established before residents can be allowed to move in.

| Phase 2: Floating Houses | | | |
|--|--|--------------------------------|-------------------|
| Capacity: 5000 Persons Buildings: 714 Noah Houses | | | |
| Housing | 7 Persons/House | 714 Houses | 1.000.000€ |
| | Materials, structure, construction, labor, etc. | 1.000€ / House | 70.000€ |
| | Interior furniture, appliances, furnishings, etc | 400€ / House | 30.000€ |
| Transportation | 20 Vehicles | | 100.000€ |
| | Boats/boat motors | | 60.000€ |
| | Cars, trucks, buses for builders & residents | | 40.000€ |
| Infrastructure Services & Technical Equipment | 280€ / Household | | 200.000€ |
| | Water-WASH | Desalination Plant | N/A |
| | Waste-WASH | Compost Toilet | N/A |
| | Electricity | Solar, Turbine, Hydro | N/A |
| | Communication | Satellite Receiver/Transmitter | N/A |
| Unforeseen Expenses | | | 200.000€ |
| | | | |
| | | Total | 1.500.000€ |

Table 2 - Phase 2 Financial

Note:

As aforementioned, residents cannot move into their NOAHouses until all infrastructure-services and human-services are established. None of the phases include ongoing expenses for residents such as: food, non-food items (NFI's), clothing, medical supplies, etc.

| | | | |
|---|------------------------------------|----------------|-------------------|
| Phase 3: Settlement | | | |
| Capacity: 20.000 persons | | | |
| Units: 2857 Noah Houses | | | |
| Note: Pre-existing sector of 714 houses and 5.000 persons | | | |
| Housing | 2143 Houses | 1.400€ / House | 3.000.000€ |
| Transport | | | 200.000 |
| Services & Tech Equipment | | | 300.000€ |
| Sector Infrastructure | (Table 1: Basecamp Infrastructure) | | |
| | 5,000 persons / sector | 4 sectors | 500.000 |
| | | Total | 4.000.000€ |

Table 3 - Phase 3 Financial

NOAHouses- Structure Requirements and Capabilities

1. Overview

This entry provides key information on minimum standards and best practice which should be referenced and consulted when developing planned settlements as part of a humanitarian response. These guidance notes outline the minimum standards required to ensure planned settlements enable communities to live with security and dignity in a healthy environment which improves their quality of life.

The choice of settlement location is a critical decision which will have significant impact on the protection and well-being of the settlement, as well as broader local development. While a well-positioned settlement can have multiple protective benefits and contribute to local development, a settlement in the wrong geographical location can threaten the protection and assistance of the settlement and have negative consequences for local development and the peaceful coexistence of communities.

Site planning should begin from the scale of the individual family, addressing needs at household level, such as access to water, access to communal services, recreation facilities, access to showers and latrines, waste management, etc It is advisable to consider the social structures and relations within persons of concern, including clan, tribes and extended family arrangements, as well as their traditional settlement layouts and shelter preferences. This consideration will yield a greater degree of satisfaction, and sense of ownership. The following table uses the family unit as the smallest planning 'module' and builds up to larger units:

| Module | Structure | Approximate Number |
|------------|------------------|--------------------|
| Family | 1 x family | 4-6 persons |
| Community | 16 x families | 80 persons |
| Block | 16 x communities | 1250 persons |
| Sector | 4 x blocks | 5,000 persons |
| Settlement | 4 x sectors | 20,000 persons |

Table 4 - Indicative modular planning units

2. Shelter Standards

There are several indicators determining the adequacy of shelter/housing for residents of the settlement. (See links below for additional information).

2.1 Indicator Average

Average living area per person: The size of an eco-system and living area per capita is critical in the planning of settlements as crowded conditions lead to increased morbidity and stress. The provision of adequate space, both outside and inside shelters is an essential requirement. The 'average dwelling area per person (Sqm.)' indicator measures the average living space to which a person has access in the settlement. This space should accommodate all services while promoting dignified living.

| | | | |
|--|--------------------------|----------------------------|------------------------|
| Indicator: Average living area per person (Sqm) | | | |
| Standard: | Acceptable Range: | Unacceptable Range: | Critical Range: |
| 45 sq. m | 35 sq. m | 34-30 sq. m | 29 sq. m |

A minimum surface area of 45 Sqm per person including household gardening space should be allocated. 30 Sqm per person will be necessary for foot-paths, educational facilities, sanitation, security, firebreaks, administration, water storage, markets, storage of relief items and, of course, plots for shelter. It excludes however, any land for significant agricultural activities or livestock. The remaining 15 Sqm per person is allocated to household gardens attached to the family plot which should be included in the site plan from the outset.

2.2 Housing Standard

The design of planned settlements follow UNHCR emergency standards. The table below defined the minimum standards to be applied.

| Description | Minimum Standard | Further Consideration |
|---------------------|--|--|
| Covered Living Area | 3.5 Sqm. per peron (4.5 sqm. to 5.5 sqm. is more appropriate) Minimum ceiling height of 2m at highest point | |
| Settlement Size | 45 sqm. per person (incl. kitchen and vegetable garden) | |
| Fire Safety | 30 m firebreak every 300 m Minimum 2 m between structures – use 2 times the height of the structure as an appropriate distance. | |
| Water Supply | 20 liters per person/day | Each Housing Unit has individual desalination capabilities |

Table 5 - Minimum standards for planning camps

The following are recommended site planning standards for services and infrastructure and should be referred to when preparing the camp layout:

| | | |
|---------------------------------|--|---|
| Water Tap Stand/Boat | 1 Per Community | Each community has desalination capabilities as support/back-up to housing units desalination |
| Rubbish container of 100 liters | 1 per 50 persons | 1 per 10 families |
| Health centre | 1 per 20,000 persons | 1 per settlement Include water and sanitation facilities |
| Referral hospital | | Outsource to nearest hospital Med-evac procedures |
| School | 1 per 5,000 persons | 1 per sector 3 classrooms, 50 Sqm. |
| Market place | 1 per 20,000 persons | 1 per settlement |
| Tool/Shop | 1 per 5,000 persons | 1 per block |
| Community Kitchen/Banquet Hall | 1 per 80 persons | 1 per community |
| Storage area | 15 to 20 Sqm. per 100 persons | Storage Lockers for household (family modules) |
| Lighting | As appropriate | Consider priority locations such as community kitchens, recreational areas, public service areas |
| Administration & Security Area | As appropriate | |
| Exterior deck-rails | Height 1.1 meters Diameter 25-50 mm | Rail-height in accordance to EU rail height and spacing. http://www.metalhouse-int.com/news/guidelines-for-the-european-standard-en-iso-14122-3.html |

Table 6 - Site planning standards for services and infrastructure

2.3 Site selection criteria:

Sites for planned settlements should be selected in consultation with a range of sectors, including WASH, protection and supply, as well as with technical specialists such as hydrologists, surveyors, planners, engineers, and environmental engineers. Developing an inappropriate site or failing to develop a site to standards can result in further displacement causing unnecessary further distress to persons of concern and may put some people/groups at further risk. In general, the following factors need to be considered when selecting sites for settlements:

| | |
|--------------------------|---|
| Water Resources | <p>There should be at least one water-point per 250 people, not including each house/shelter water capabilities</p> <p>Importing water should be avoided if possible to reduce dependency on exterior states</p> |
| Electricity | <p>Use of fossil-fuels prohibited, unless for emergency situations (depletion of storage batteries).</p> <p>Each house should support 2.500 kwh a year per person</p> <p>Each house should support _____ volt battery</p> <p>Each community will have back-up batteries/farms on community infrastructure</p> |
| Accessibility | <p>Ensure the site has an adequate foot-path infrastructure; access to it should be reliable.</p> <p>Assess the site's proximity to nearby services, including health facilities, markets and towns.</p> <p>Access to and from the island's to land for emergency protocols</p> <p>Requirements for boats between houses and infrastructures as alternatives to walking-paths. Should consider small craft powered by humans</p> <p>Requirements to access land in case of inclement weather, medical emergencies, access to other communities and information, commuting for work, etc.</p> <p>Mobility Rights</p> |
| Security | <p>The site should be located a sufficient distance from international borders (50km), conflict zones, and other potentially sensitive areas (such as military installations).</p> <p>Avoid locations that experience extreme climatic conditions, or present evident health (malaria), environmental or other risks.</p> <p>High winds can damage temporary shelters and increase fire risks.</p> <p>Evaluate seasonal variations</p> |
| Environment & Vegetation | <p>Waste-water & Waste removal/impact on ecosystem</p> <p>Requirements all cleaning chemicals are safe for the environment</p> <p>Consideration of laundry/WASH facilities utilizing UV sanitation to decrease chemical usage</p> <p>Farming & Fishing regulations according to conservation, season, etc.</p> |

Table 7 - Site Selection