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College Of Engineering
Architecture Department
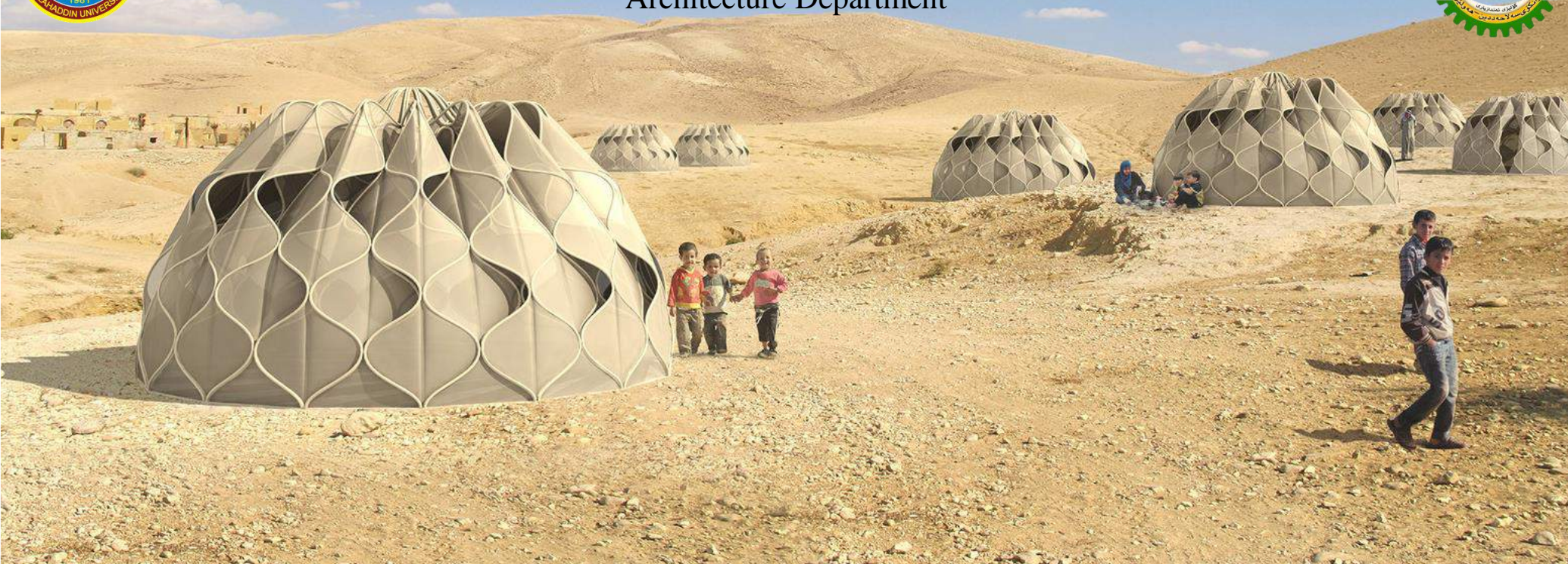
Refugees Camp

Thesis Project
2018-2019

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CHAPTER 1

Introduction

1.1 Introduction

This chapter define refugees camp project and explain the project, in this chapter has some definition of project and terms to understand project, this chapter explain historical background to understand how people to be refugee in the past and in this chapter explain project aim and reasons to selection the project finally show who is beneficiary of the project.

1.2 Thesis Statement

This thesis to explain how to create a camp for people who they left their country or city by disaster of nature , wars and desertification.

The purpose to create this project to provide suitable life for refugees, the important point to be considerate is a cost which must be provide low cost with suitable life.

Children is a future of any nation that need to provide a suitable life for them and provide school for them because just % 53 of children have a opportunity to study and they should have good education and provide portable shelter for the refugees. (UNHCR{1} , United Nations High Commissioner for Refugees)

All of the dwelling units that can use another time because thesis camp is temporary camp and the refugees will go to their country when their country or city suitable for life.

Figure 1-1

1.3 Definitions Of Terms

Camp: a place with temporary accommodation of huts, tents, or other structures, typically used by soldiers, refugees, or travelling people. (Oxford Dictionary)

Refugees: A person who has been forced to leave their country in order to escape war, persecution, or natural disaster. (Oxford Dictionary)

A refugee camp: is a temporary settlement built to receive refugees and people in refugee-like situations. Refugee camps usually accommodate displaced persons who have fled their home country, but there are also camps for internally displaced persons. (Oxford Dictionary)

Migrant: a person who moves from one place to another, especially in order to find work or better living conditions. (Oxford Dictionary)

Disaster: A sudden accident or a natural catastrophe that causes great damage or loss of life. (Oxford Dictionary)

Figure1-2

1.4 Historical Background

In the time human was create by god who try to find a restful place and a good life Couse of this reason human migrated in a place to another place, but since the boundary of country was create, humans when go from his or her country to another country they to be a migrant or refugees.

The idea that a person who sought sanctuary in a holy place could not be harmed without inviting divine retribution was familiar to the ancient Greeks and ancient Egyptians. However, the right to seek asylum in a church or other holy place was first codified in law by King Æthelberht of Kent in about AD 600. Similar laws were implemented throughout Europe in the Middle Ages. The related concept of political exile also has a long history: Ovid was sent to Tomis; Voltaire was sent to England. By the 1648 Peace of Westphalia, nations recognized each other's sovereignty. However, it was not until the advent of romantic nationalism in late 18th-century Europe that nationalism gained sufficient prevalence for the phrase country of nationality to become practically meaningful, and for border crossing to require that people provide identification.
Turkish refugees from Edirne, 1913
One million Armenians were forced to leave their homes in Anatolia in 1915, and many either died or were murdered on their way to Syria.

The term "refugee" sometime applies to people who might fit the definition outlined by the 1951 Convention, were it applied retroactively. There are many candidates. For example, after the Edict of Fontainebleau in 1685 outlawed Protestantism in France, hundreds of thousands of Huguenots fled to England, the Netherlands, Switzerland, South Africa, Germany and russia. The repeated waves of pogroms that swept Eastern Europe in the 19th and early 20th centuries prompted mass Jewish emigration (more than 2 million Russian Jews emigrated in the period 1881–1920). Beginning in the 19th century, Muslim people emigrated to Turkey from Europe. The Balkan Wars of 1912–1913 caused 800,000 people to leave their homes. Various groups of people were officially designated refugees beginning in World War I.

Figure 1-3

Refugees from Herzegovina, painting by Uros Predic

1.5 Project Aim

The main aim of project is to create a comfortable environment for refugee by using good planning and suitable shelter for refugees. Create a temporary shelter to be transport by easy way, with good price and safety shelter.

1.5.1 Objectives of the project

1. Refugees place solution
 to create a place for refugees and providing suitable life.

2. Economy
To decrease cost of the camp by using recycle elements.

3. Portable shelter
 to create portable and movable shelter, because camp is a temporary place.

4. Security
To provide safety and security in the camp because they left their place to provide safety.

5. Sustainability
To create sustainability camp by use solar energy, green area and recycle trash.

6. Food & Water
 To provide psychological needs because it is a necessary for them like (food and water)

7. Social interaction
 To create a public space for achieve good social interaction and good environment..

8. Children education
 it is important to provide education for children to study in the camps specially for girls (Because in the middle east girls do not study).

Figure 1-4

1.6 Reasons Of Selection

In the world people became a refugee and migrant Couse of wars and natural phenomena, specially in the middle east, so this project is important for people.
By a warning comes from the United Nations Convention to Combat Desertification (UNCCD)2, which estimates that some 135 million people may be displaced by 2045 as a result of desertification.
Then we must to create a suitable camps for the refugees by suitable environment and cost. (UNCCD, United Nations Convention to Combat Desertification)

There are some of proposal camps but all projects in the Syria and Jordan, the purpose to select this project to serve Iraqi refugees.

Refugees living in hard life and their environment is not comfortable for the simple life I will provide the better life for them.

The most of the children's sequester in the educational process so this project provide educational environment for them.

Figure 1-5

2-UNCCD:Established in 1994, UNCCD is the sole legally binding international agreement linking environment and development to sustainable land management.

08

1.7 Beneficiaries Of The Project

1. Refugees

The main reason behind the selection this project is needs, because in the middle east most of the time have Religious National/Social/Racial/Political Persecution, War, Gender/Sexual Orientation, Hunger and climate Change problems, .

2. Erbil Government

To help Erbil government by use low cost material and to get strong economy infrastructure.

3. Environment

To help environment by create sustainability units and farming (depend of the earth) and recycle the trash material for example I will recycle the plastic to create a Shelter.

Figure 1-6

CHAPTER | 2

Site Selection

2.1 Introduction:

The Chapter about the site selection, the thesis has three sites, and show location of the sites
and evaluate all sites by some criteria's and table finally chose one of them for project.

2.2 Project Location In Erbil

All sites located in Erbil City in Iraqi.

World

Iraq

Erbil

Figure 2-1

2.3 Criteria of Selecting Sites

2.3.1 Topography, Drainage and soil conditions :

- The topography of the land should permit easy drainage and the site should be located above flood level. Rocky, impermeable soil should be avoided. Land covered with grass will prevent dust. Wherever possible, steep slopes, narrow valleys, and ravines should be avoided. (1)

- Ideally, a site should have a slope of 2%–4% for good drainage, and not more than 10% to avoid erosion and the need for expensive earthmoving for roads and building construction. (1)

- Soils that absorb surface water swiftly facilitate the construction and effectiveness of pit latrines. (1)

- Pit latrines should not penetrate into the ground water. The groundwater table should be at least 3m.below the surface of the site. (1)

- If possible, select a site where the land is suitable for vegetable gardens or small scale cultivation. (1)

2.3.2 Water Resources:

- Choose locations that are reasonably close to an adequate source of good water, and ideally near high ground that has good surface water run-off and drainage. Once located, water sources should be protected. Ideally, no individual should have to walk for more than a few minutes. There should be at least one water point for every 250 people. (1)

- Ideally, hydrological surveys will provide information on the presence of water. A site should not be selected on the assumption that water will be found by drilling.Trucking water over long distances should be avoided if possible. (1)

2.3.3 Land Rights:

- UNHCR neither purchases nor rents land for refugee settlements. (1)

- Refugees should enjoy exclusive use of the site in which they live, by agreement with national and local authorities. (1)

- Governments often make public land available. (1)

- Private or communal land(including unclosed pastoral land) may only be used if the Government has agreed a formal legal arrangement with the owner(s), in accordance with the laws of the country. (1)

- In association with the Government and host community, agree and clarify the entitlement of refugees to carryout given activities (forage for food, collect firewood, collect timber and other shelter materials such as grass or mud, gather fodder and graze animals). (1)

2.3.4 Accessibility :

- Ensure the site has an adequate road infrastructure; access to it should be reliable, including during the rainy season. (1)

- Assess the site's proximity to national services, including health facilities, markets and towns. Access to mainstream services is encouraged wherever possible and avoids the need to develop parallel services for the camp population. (1)

- Liaise with development agencies, including UNDP and related Government ministries, to secure improvement of access routes. (1)

- UNHCR should fund the cost of building short access roads connecting the site to the main road. (1)

2.3.5 Environment And Vegetation :

- Ensure the site has sufficient ground cover (grass, bushes and trees). Vegetation provides shade, protects from wind, and reduces erosion and dust. (1)

- Avoid sites where dust clouds are common; these cause respiratory disease. (1)

- Avoid sites within 1 day's walk of an environmentally protected area (such as a wild-life reserve). (1)

- Take steps to ensure access to a supply of firewood, in collaboration with local forestry authorities, and in negotiation with the host community. (1)

(UNHCR{1} , United Nations High Commissioner for Refugees)

2.3.6 Security :

- The site should be located a sufficient distance from international borders (50km), conflict zones, and other potentially sensitive areas (such as military installations). Avoid locations that experience extreme climatic conditions, or present evident health (malaria), environmental or other risks. (1)

- High winds can damage temporary shelters and increase fire risks. (1)

- Evaluate seasonal variations. Sites that are ideal in the dry season may be uninhabitable in the rainy season. (1)

- Avoid locating refugees in places whose climate differs greatly from that to which they are accustomed. (1)

2.4 Location of sites

All Sites should be in suburban.

Figure 2-2

- ● bahrka camp
- ● kawrgosk camp
- ● Qushtapa camp

2.4.1 Kawrgosk Site (Alternative 1)

Kawrgosk site located in the North-West of the Erbil city, near kawrgosk
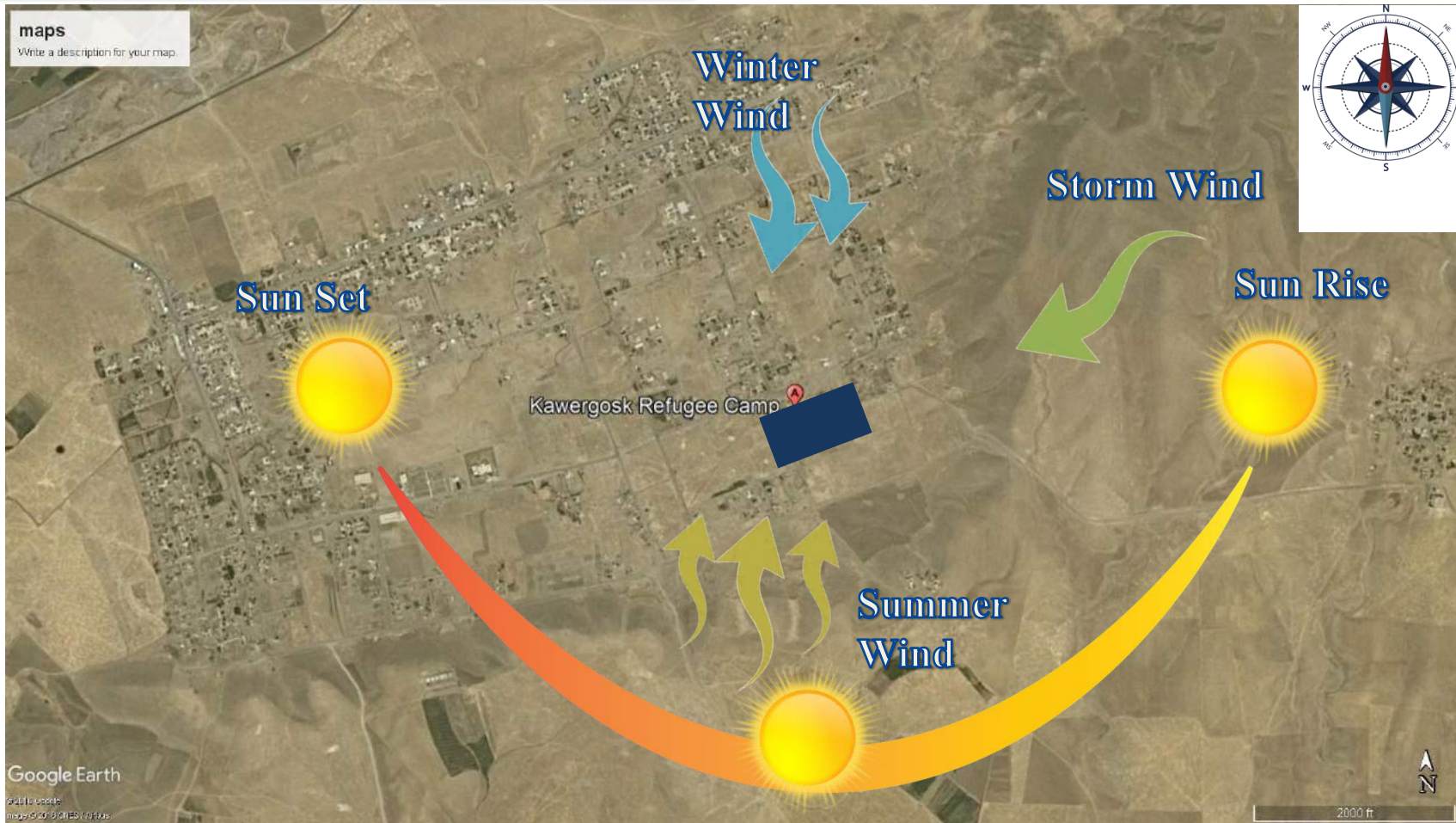
2.4.1.1 Climate of Site:

Figure 2-3

2.4.1.1 Climate of Site:

Temperature:

In Summer:

- Climate in Erbil very hot and dry in summer

- Month of summer include June, July, August and September

- In summer degree between 39-43C but some time reach high degree nearly 50 degree

Temperature:

In winter:

- Winter are mild, except in the high mountain.

- Month of winter include December, January, February and March
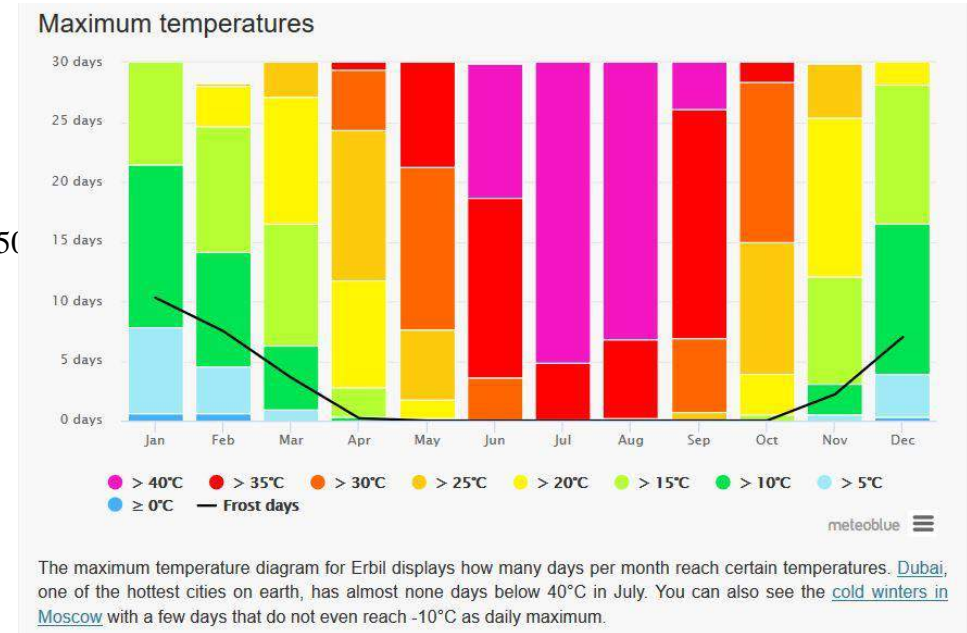
- In winter degree between 2.4-18.1C

Maximum temperatures

The maximum temperature diagram for Erbil displays how many days per month reach certain temperatures. Dubai, one of the hottest cities on earth, has almost none days below 40°C in July. You can also see the cold winters in Moscow with a few days that do not even reach -10°C as daily maximum.

Figure 2-4

2.4.1.1 Climate of Site:

Temperature:

In spring:

- Climate in Erbil cool and some time is sun and some time rainfall.

- Month of Spring include April and may

- In Spring degree between 11.1-31.5C

Temperature:

In Autumn:

- In Autumn climate not rigid it is change rapidly most time is cloudy weather.

- Month of autumn include October and November
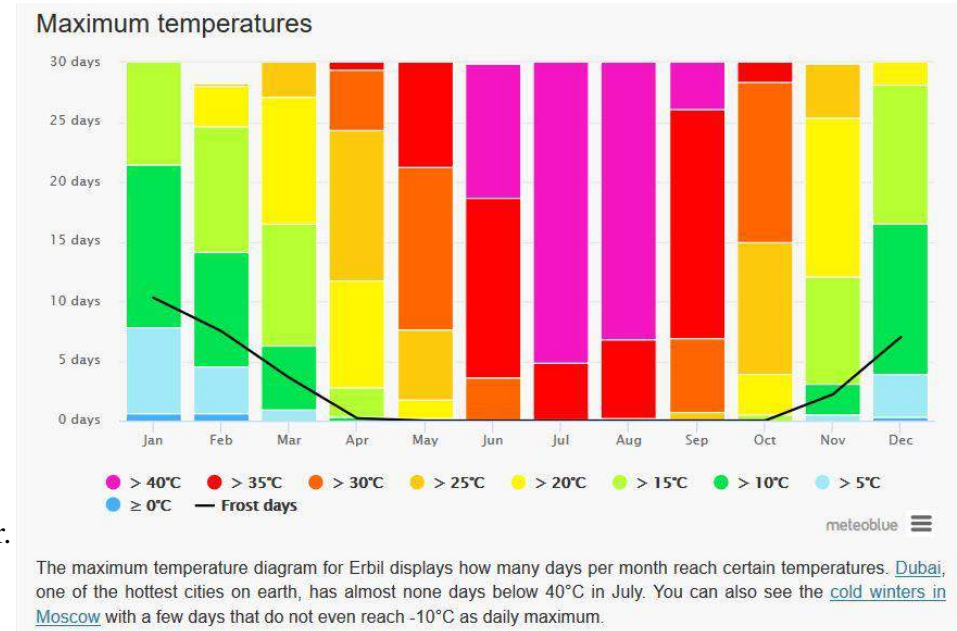
- In winter degree between 8.9-30.6 C

Maximum temperatures

Legend: > 40°C, > 35°C, > 30°C, > 25°C, > 20°C, > 15°C, > 10°C, > 5°C, ≥ 0°C, — Frost days

The maximum temperature diagram for Erbil displays how many days per month reach certain temperatures. Dubai, one of the hottest cities on earth, has almost none days below 40°C in July. You can also see the cold winters in Moscow with a few days that do not even reach -10°C as daily maximum.

Figure 2-5

2.4.1.1 Climate of Site:

Rainfall:

It is important to know level of rain in Erbil because rain has a big role in this project to calculate pips and sewerage system.

- The most of rainfall in the winter and in Erbil winter is very cold.

- Average of rainfall in the winter is (259.8) last (ten) years, max rainfall (543), min rainfall (97.8) in the last ten years
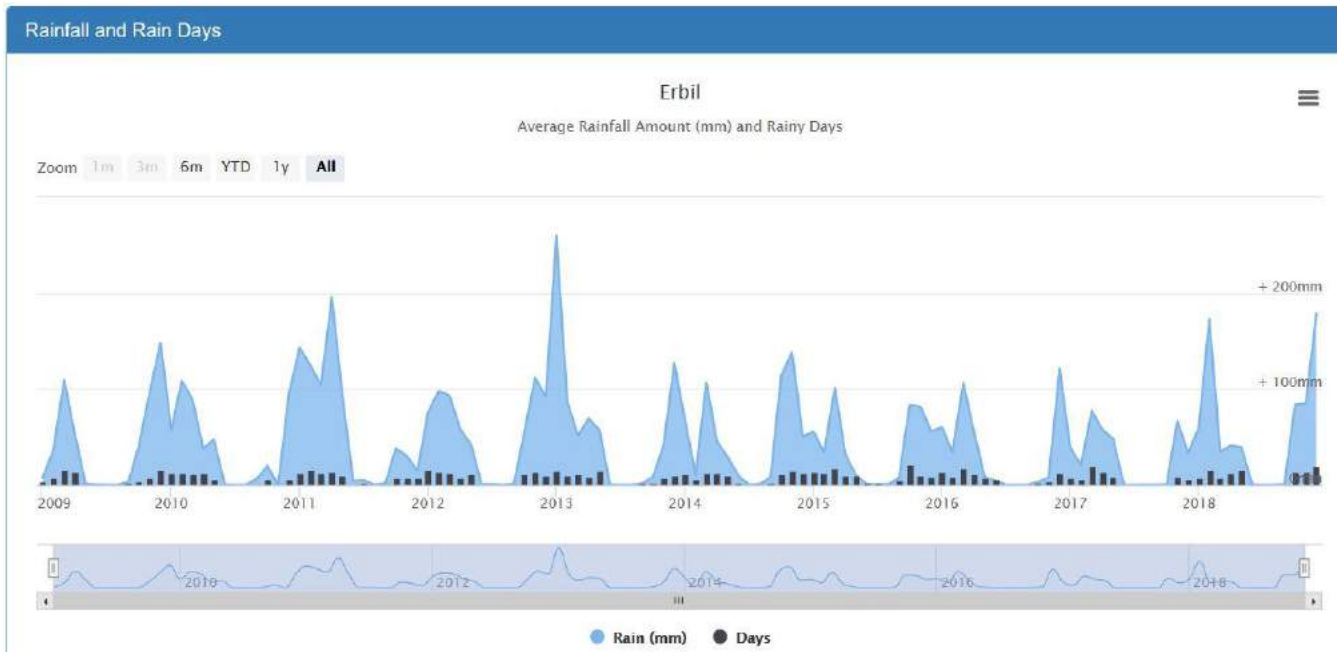

Figure 2-6

2.4.1.1 Climate of Site:

Sun:
The location of the site decide how to sun impact on the site.

Figure 2-7

In Winter:

- As can be clearly seen the two paths are different, with it been shorter and lower in the sky during winter.

In Spring:

- In spring and autumn sun position between summer and winter.

In Summer:

- As can be clearly seen the two paths are different, with it been longer and higher in the sky in summer.

In Autumn:

- In spring and autumn sun position between summer and winter.
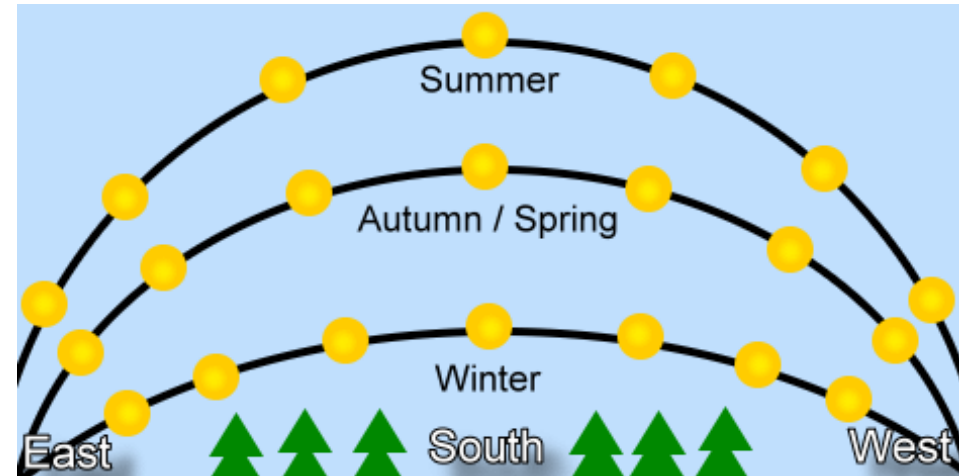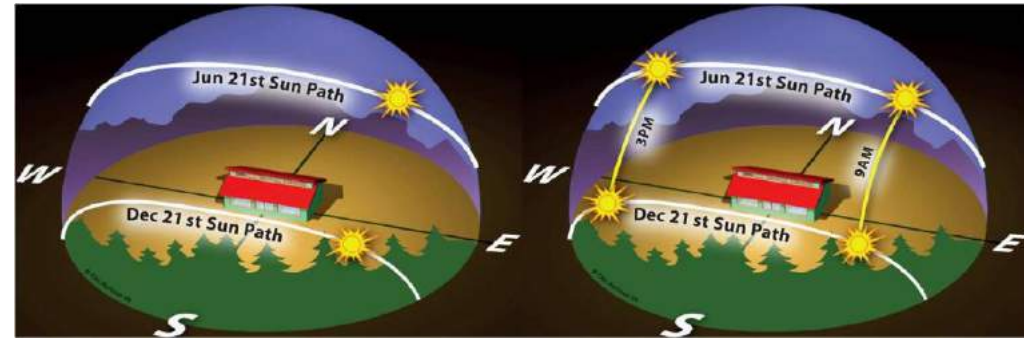
Figure 2-8

2.4.1.1 Climate of Site:

Wind:
- Wind have impact on the buildings and in this project shelters is small and structure of them not rigid like concrete or other structure.

- Wind provide ventilation for us, it is important to soft wind in site project.

In Winter:

- Max wind speed in winter is 28 km/h.

In Spring:

- Max wind speed in spring is 38 km/h.

In Summer:

- Max wind speed in summer is 28 km/h.

In Autumn:

- Max wind speed in autumn is 28 km/h.

Direction of wind:
- The most wind in the North - East

Wind rose

The wind rose for Erbil shows how many hours per year the wind blows from the indicated direction. Example SW: Wind is blowing from South-West (SW) to North-East (NE). Cape Horn, the southernmost land point of South America, has a characteristic strong west-wind, which makes crossings from East to West very difficult especially for sailing boats.

Figure 2-10

Wind speed

The diagram for Erbil shows the days per month, during which the wind reaches a certain speed. An interesting example is the Tibetan Plateau, where the monsoon creates steady strong winds from December to April, and calm winds from June to October.

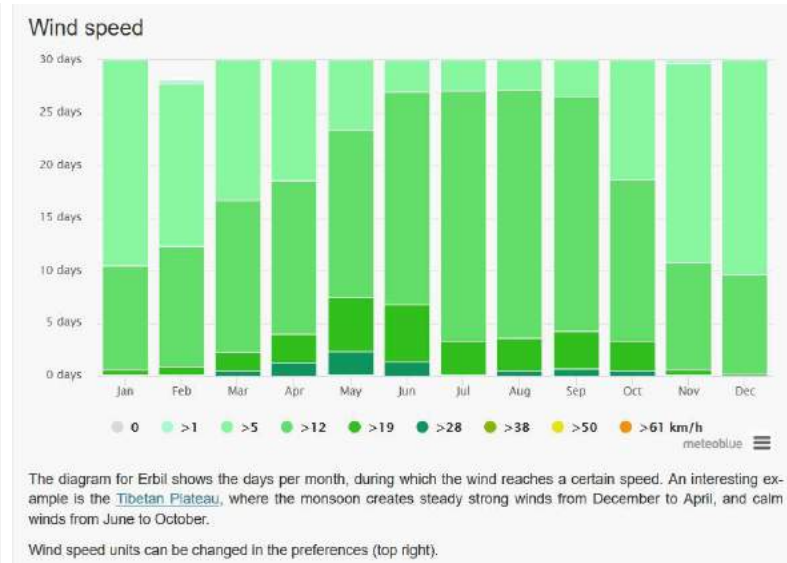Wind speed units can be changed in the preferences (top right).

Figure 2-9

2.4.1.2 Criteria of site

- Located in kawrgosk
- The Site with municipality service
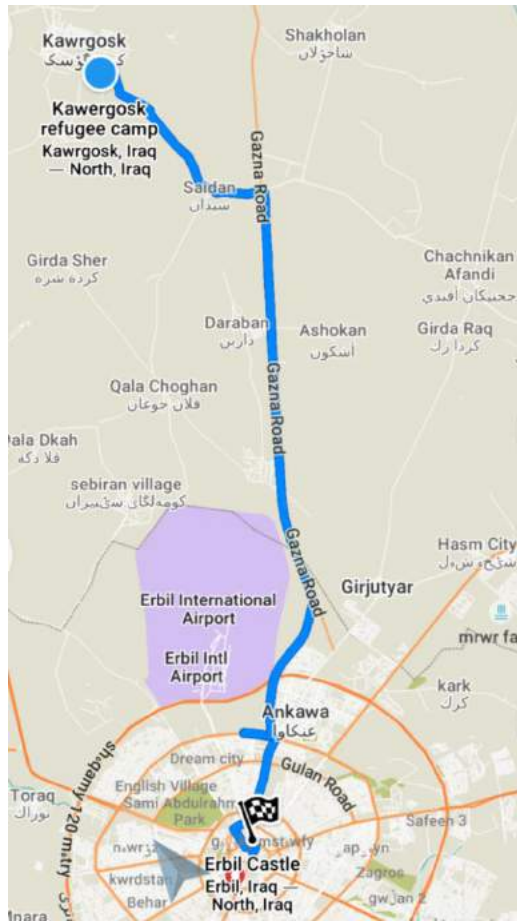- 32 km far from Erbil city center
- Accessibility is good

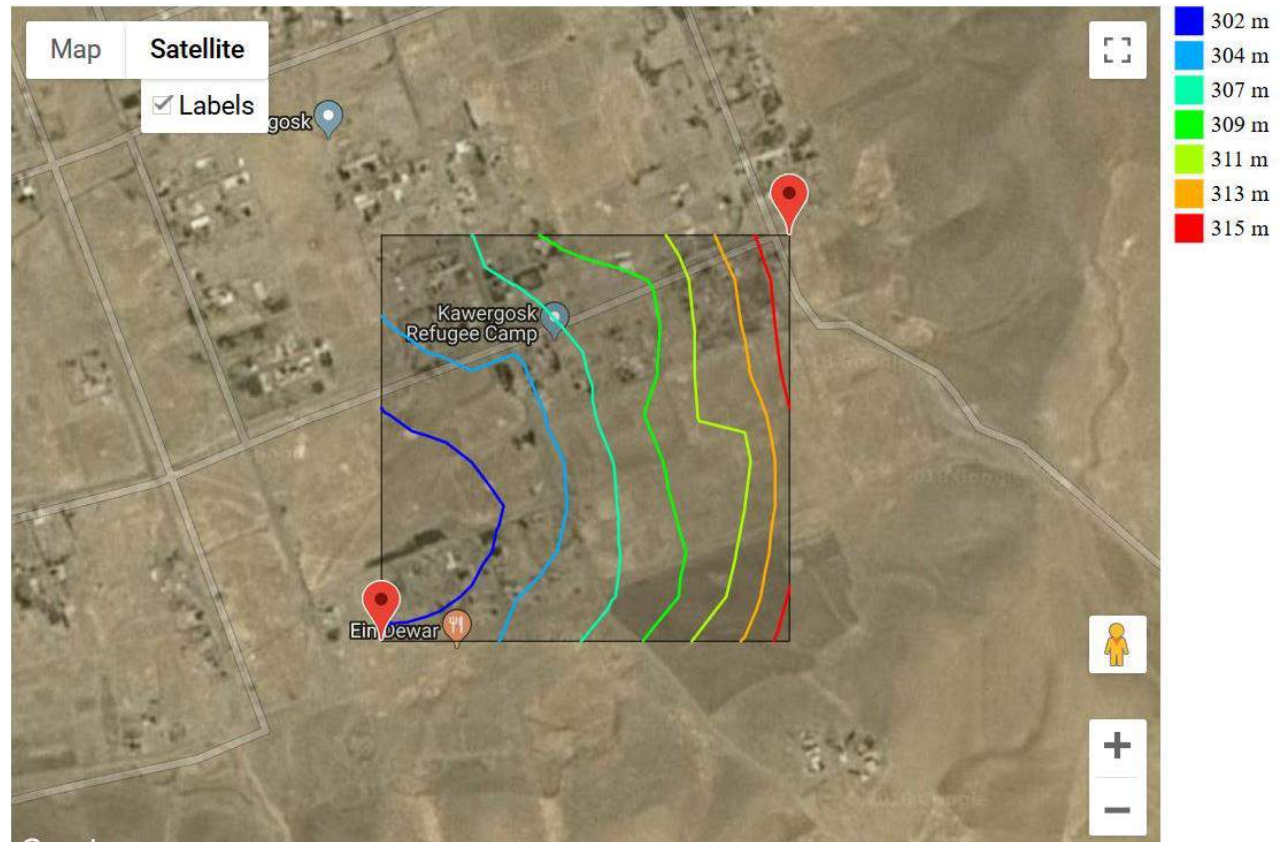- Slope of the site 9m

Figure 2-12

Figure 2-11

2.4.1.1 Criteria of site

- The site should be located a sufficient distance from international borders (50km), conflict zones, and other potentially sensitive areas (such as military installations).

- Far from near point of International borders approximately 150 km, and far from conflict zones, and sensitive area.

Figure 2-13

2.4.1.1 Criteria of site

- Area of site = 453, 909 msq
- Security is good
- The site have water source
- The site good for vegetation
- Government owned the site
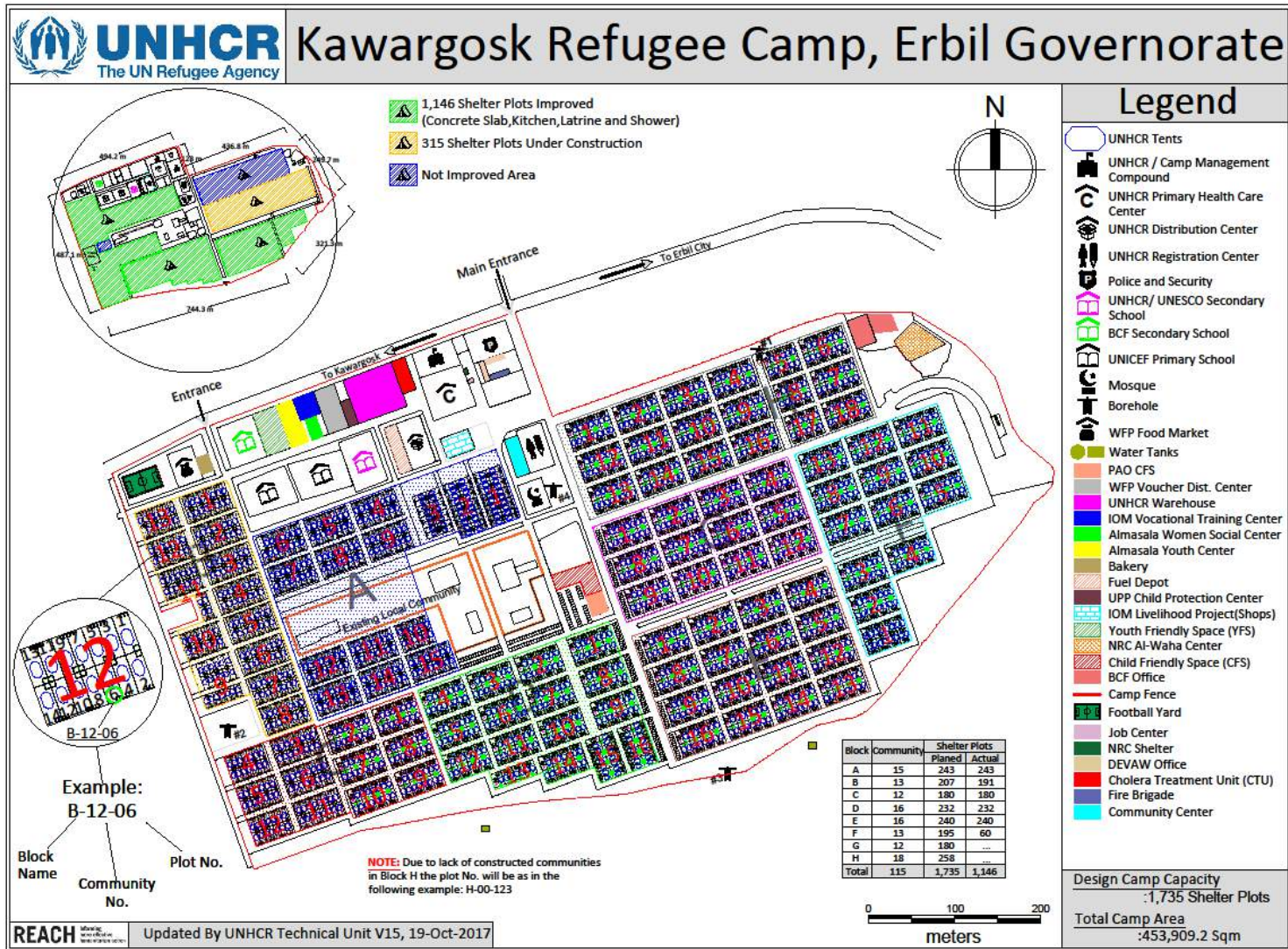
N
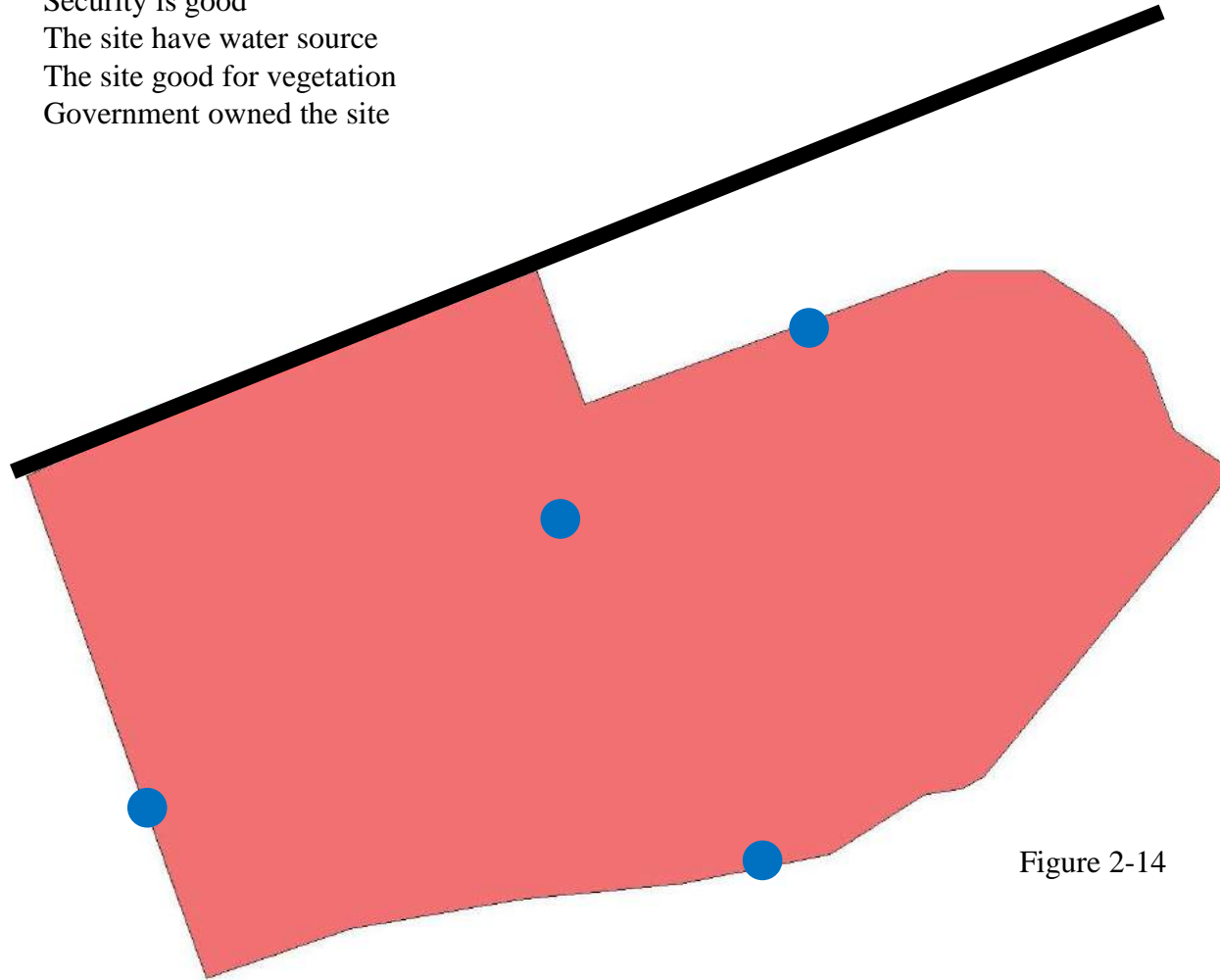
Site

Main Road

Water Source

Figure 2-14

Figure 2-15

2.4.2 bahrka Site (Alternative 2)

bahrka site located in the North of the Erbil city, om Bahrka road
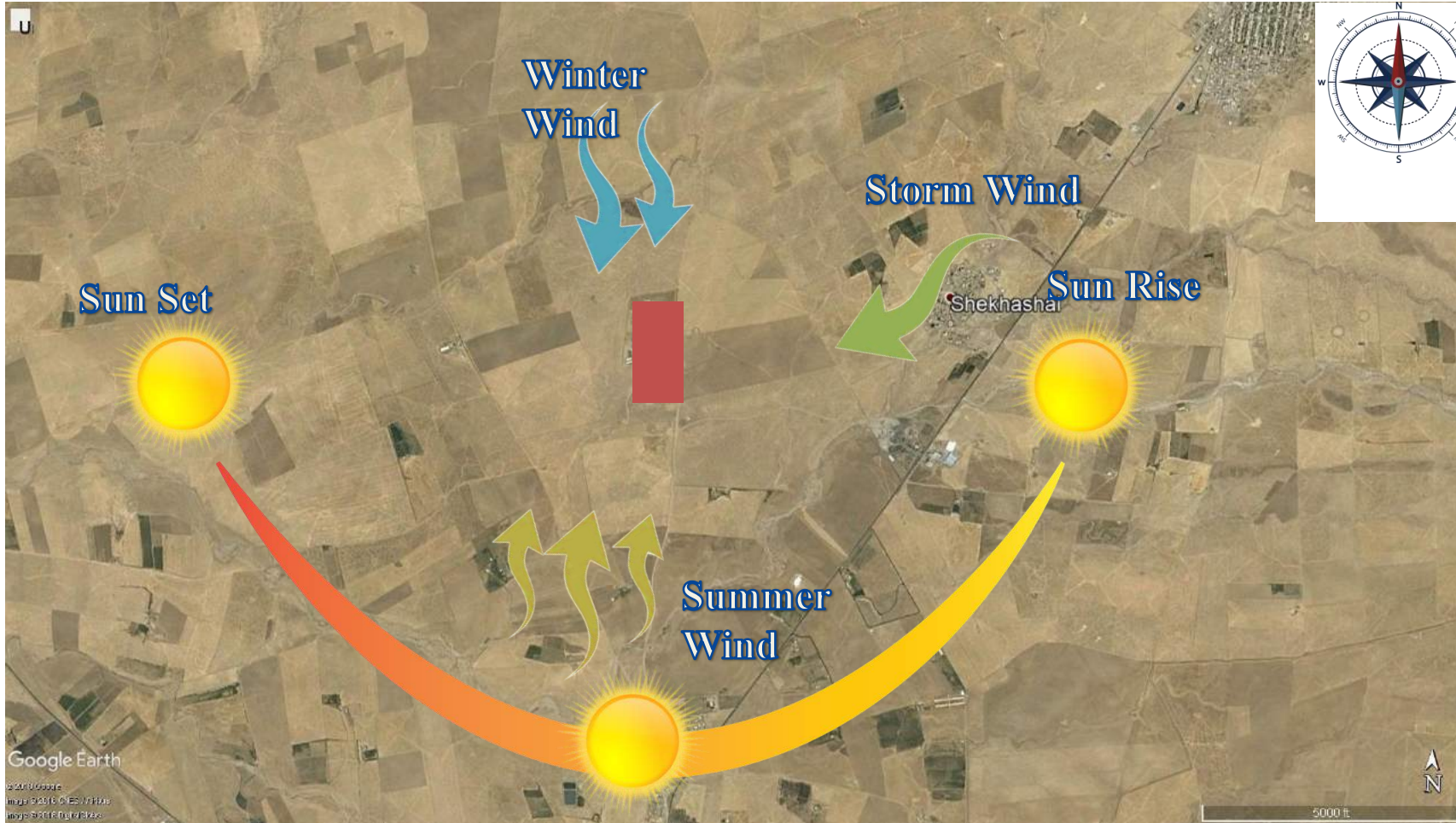
2.4.2.1 Climate of Site:

Figure 2-16

2.4.1.1 Climate of Site:

Temperature:

In Summer:

- Climate in Erbil very hot and dry in summer

- Month of summer include June, July, August and September

- In summer degree between 39-43C but some time reach high degree nearly 50 degree

Temperature:

In winter:

- Winter are mild, except in the high mountain.

- Month of winter include December, January, February and March
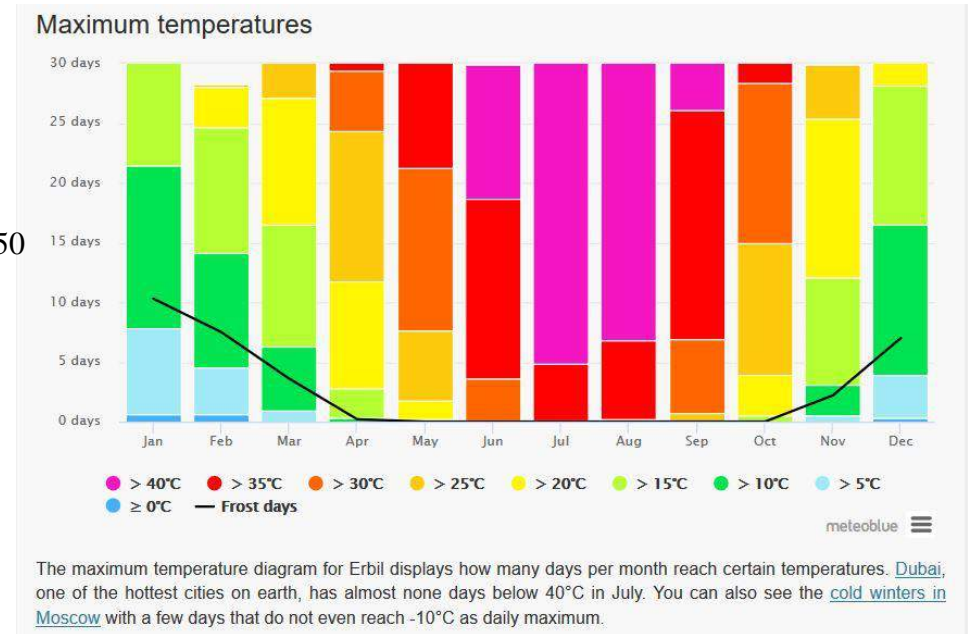
- In winter degree between 2.4-18.1C

Maximum temperatures

Legend: > 40°C, > 35°C, > 30°C, > 25°C, > 20°C, > 15°C, > 10°C, > 5°C, ≥ 0°C, — Frost days

The maximum temperature diagram for Erbil displays how many days per month reach certain temperatures. Dubai, one of the hottest cities on earth, has almost none days below 40°C in July. You can also see the cold winters in Moscow with a few days that do not even reach -10°C as daily maximum.

Figure 2-17

2.4.1.1 Climate of Site:

Temperature:

In spring:

- Climate in Erbil cool and some time is sun and some time rainfall.

- Month of Spring include April and may

- In Spring degree between 11.1-31.5C

Temperature:

In Autumn:

- In Autumn climate not rigid it is change rapidly most time is cloudy weather.

- Month of autumn include October and November
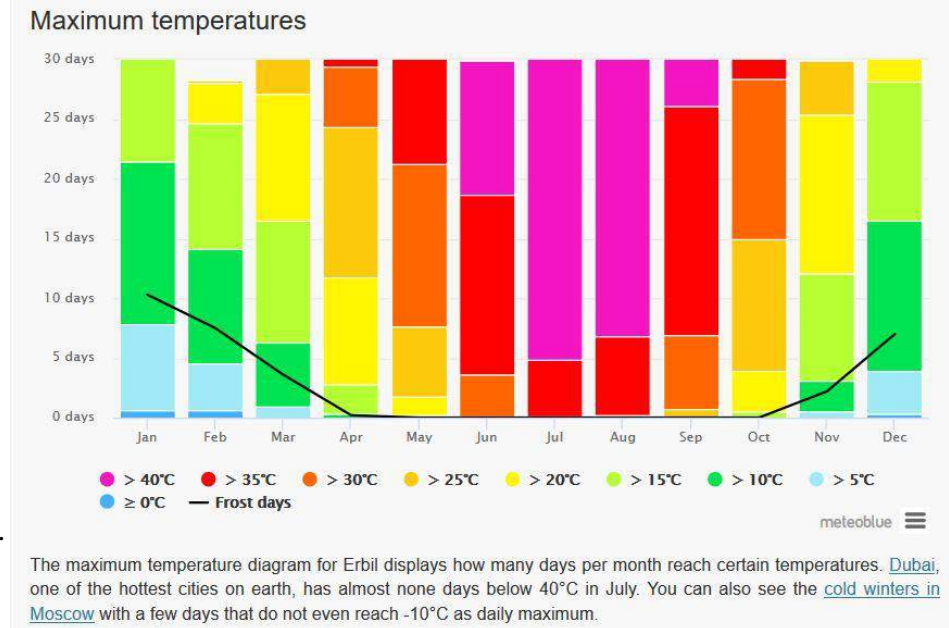
- In winter degree between 8.9-30.6 C

Maximum temperatures

- ● > 40°C ● > 35°C ● > 30°C ● > 25°C ● > 20°C ● > 15°C ● > 10°C ● > 5°C
- ● ≥ 0°C — Frost days

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Figure 2-18

2.4.1.1 Climate of Site:

Rainfall:

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- Average of rainfall in the winter is (259.8) last (ten) years, max rainfall (543), min rainfall (97.8) in the last ten years
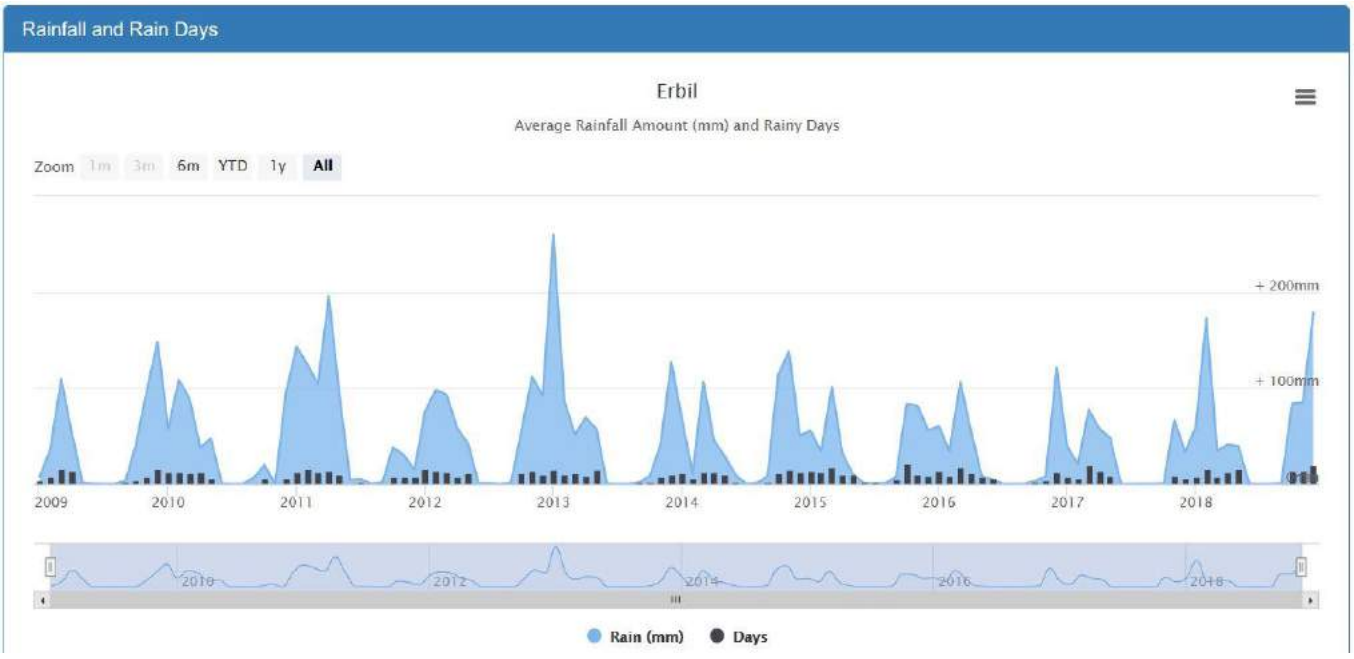

Figure 2-19

2.4.1.1 Climate of Site:

Sun:
The location of the site decide how to sun impact on the site.

Figure 2-20

In Winter:

- As can be clearly seen the two paths are different, with it been shorter and lower in the sky during winter.

In Spring:

- In spring and autumn sun position between summer and winter.

In Summer:

- As can be clearly seen the two paths are different, with it been longer and higher in the sky in summer.

In Autumn:

- In spring and autumn sun position between summer and winter.
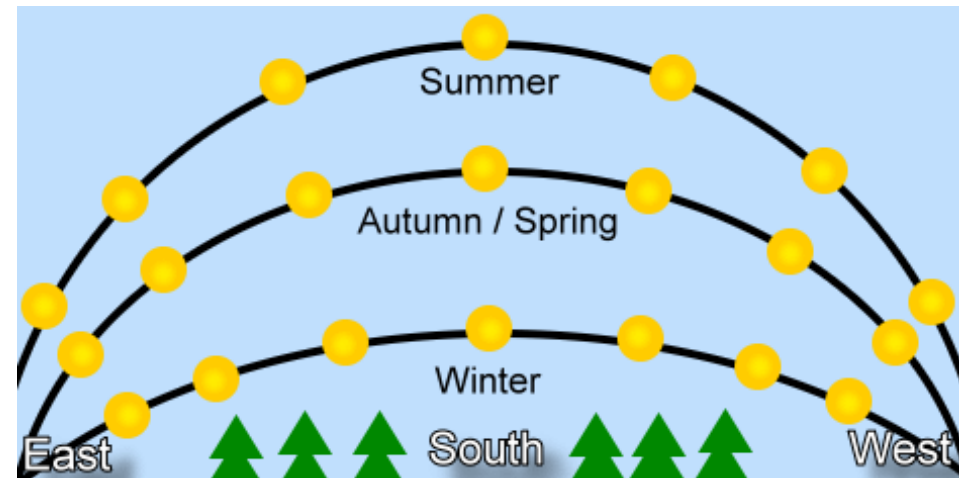
Figure 2-21

2.4.1.1 Climate of Site:

Wind:
- Wind have impact on the buildings and in this project shelters is small and structure of them not rigid like concrete or other structure.

- Wind provide ventilation for us, it is important to soft wind in site project.

In Winter:

- Max wind speed in winter is 28 km/h.

In Spring:

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In Autumn:

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Direction of wind:
- The most wind in the North - East

Wind rose

The wind rose for Erbil shows how many hours per year the wind blows from the indicated direction. Example SW. Wind is blowing from South-West (SW) to North-East (NE). Cape Horn, the southernmost land point of South America, has a characteristic strong west-wind, which makes crossings from East to West very difficult especially for sailing boats.

Figure 2-23

Wind speed

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Wind speed units can be changed in the preferences (top right).
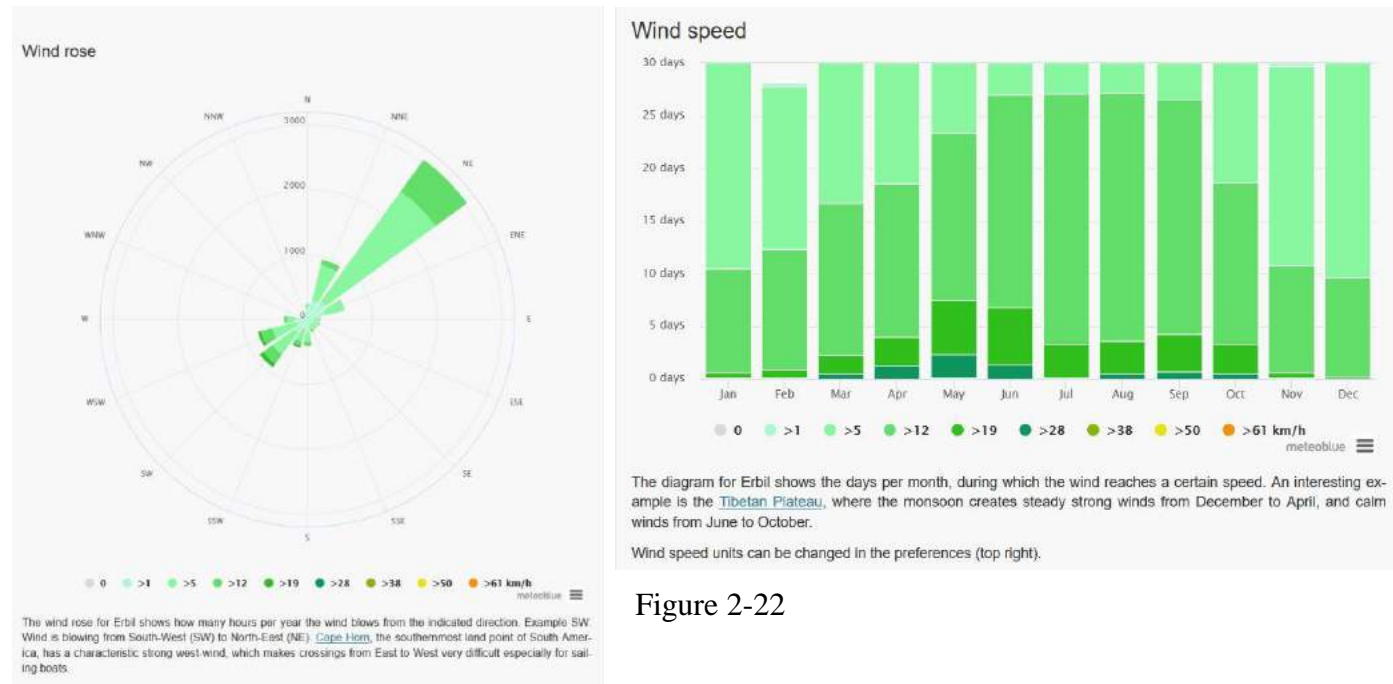
Figure 2-22

2.4.2.1 Criteria of site

- Located in bahrka road
- The Site with municipality service
- 14 km far from Erbil city center
- Accessibility is good
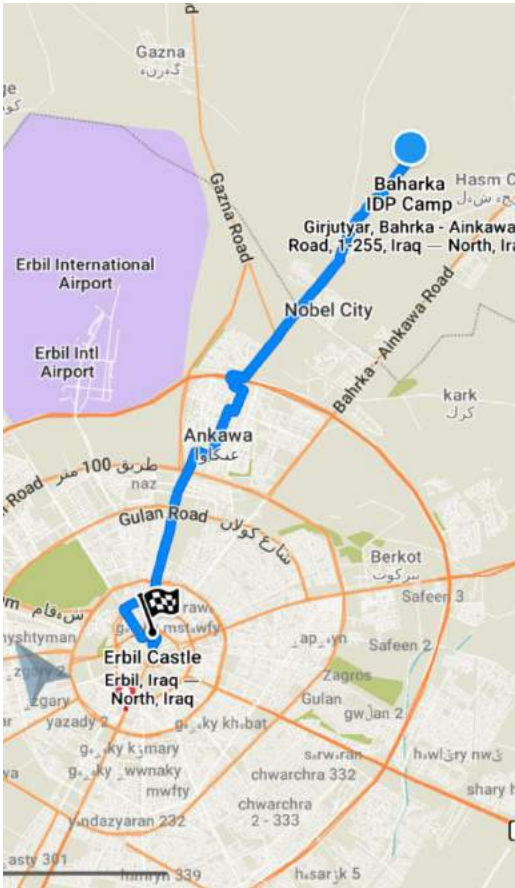- Near from city center

- Slope of the site 3m

Figure 2-25

Figure 2-24

2.4.2.1 Criteria of site

- The site should be located a sufficient distance from international borders (50km), conflict zones, and other potentially sensitive areas (such as military installations).

- Far from near point of International borders approximately 95 km, and far from conflict zones, and sensitive area.

Figure 2-26

2.4.2.1 Criteria of site

- Area of site = 140,689 msq
- Security is good
- The site have water source
- The site not good for vegetation
- Government owned the site

N

Site

Road

Water Source
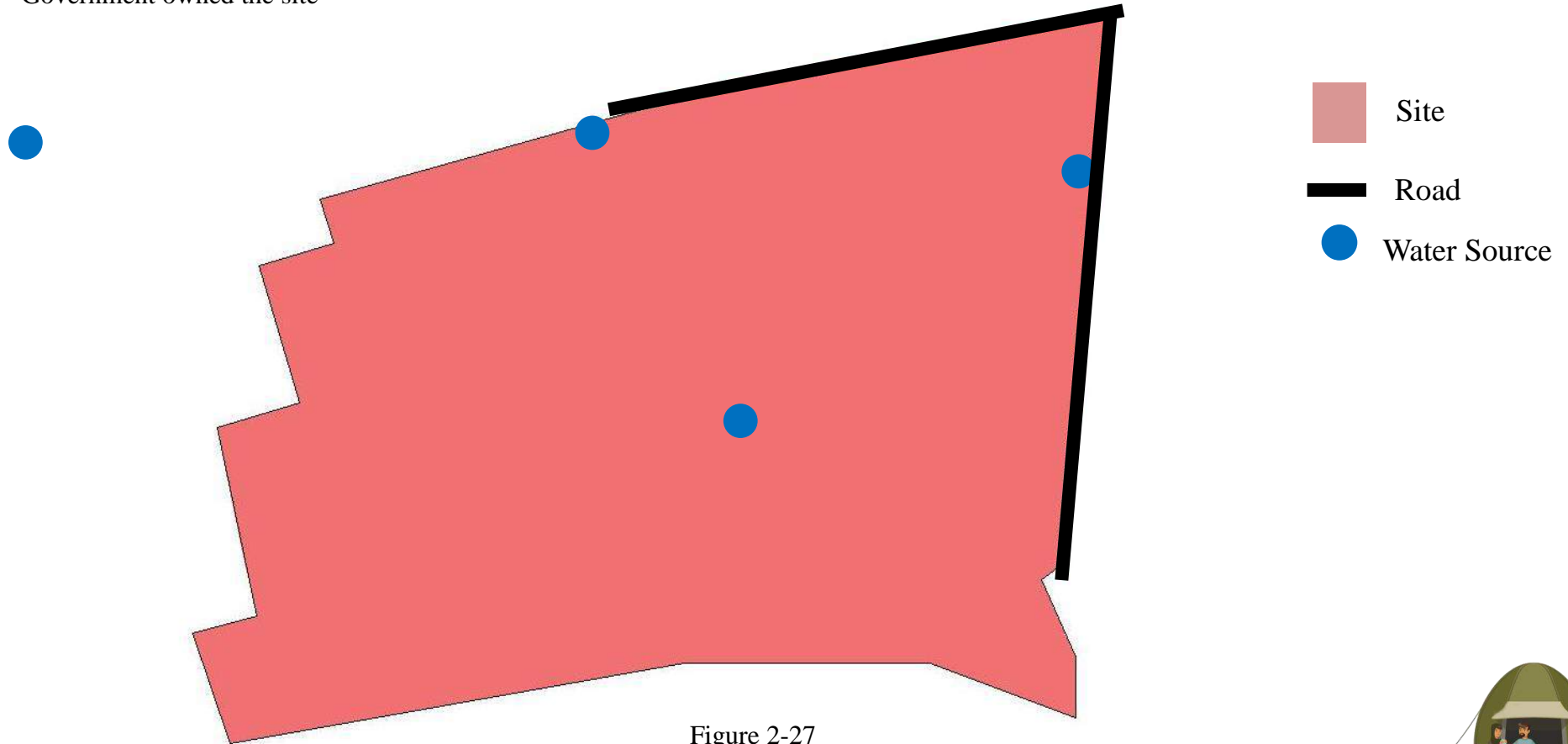
Figure 2-27

Figure 2-28

2.4.3 Qushtapa Site (Alternative 3)

Qushtapa site located in the South of the Erbil city, near Qushtapa

2.4.2.1 Climate of Site:
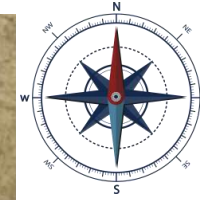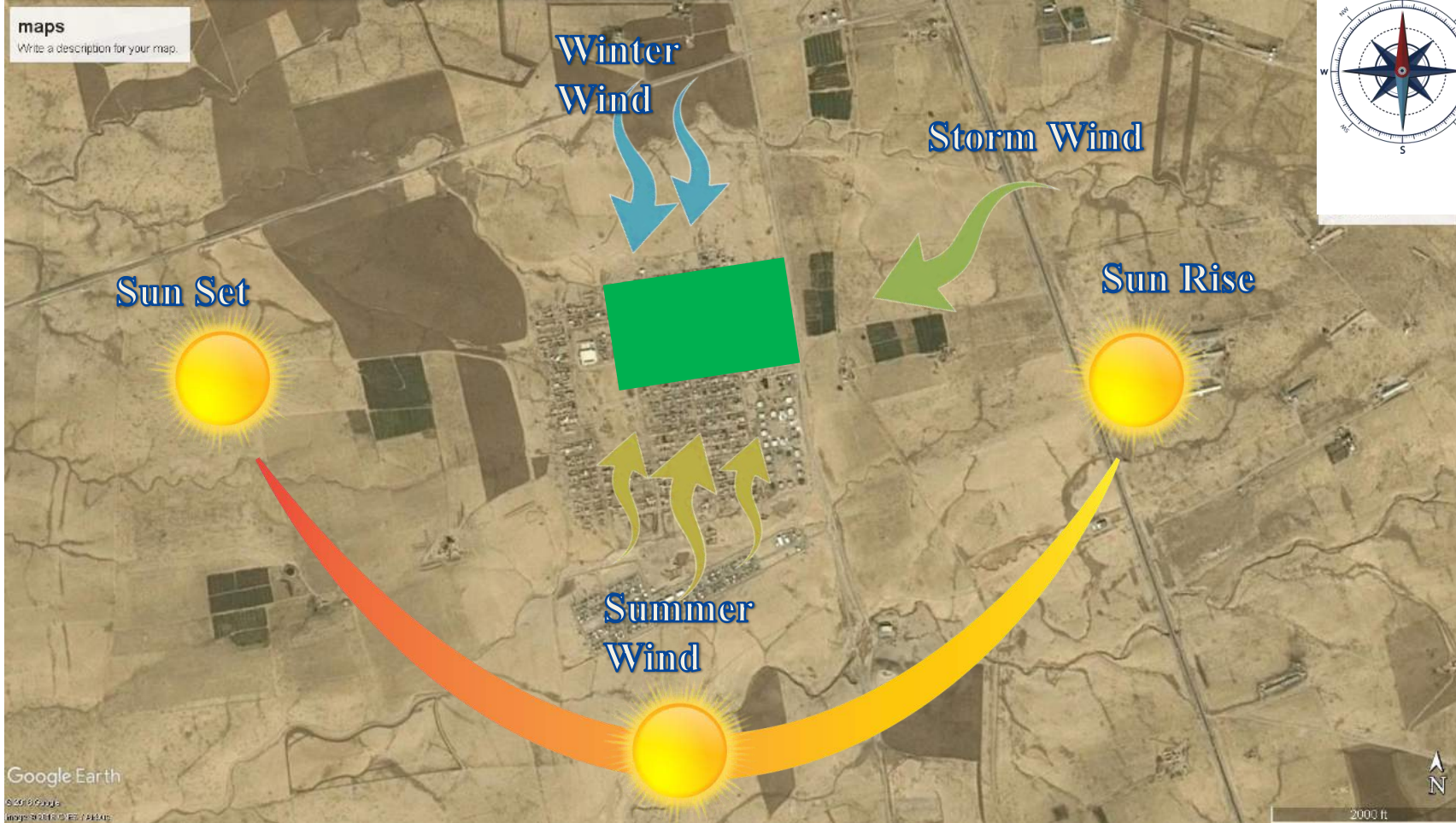
Figure 2-29

2.4.1.1 Climate of Site:

Temperature:

In Summer:

- Climate in Erbil very hot and dry in summer

- Month of summer include June, July, August and September

- In summer degree between 39-43C but some time reach high degree nearly 50 degree

Temperature:

In winter:

- Winter are mild, except in the high mountain.

- Month of winter include December, January, February and March

- In winter degree between 2.4-18.1C

Maximum temperatures

Legend: ● > 40°C ● > 35°C ● > 30°C ● > 25°C ● > 20°C ● > 15°C ● > 10°C ● > 5°C ● ≥ 0°C — Frost days

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The maximum temperature diagram for Erbil displays how many days per month reach certain temperatures. Dubai, one of the hottest cities on earth, has almost none days below 40°C in July. You can also see the cold winters in Moscow with a few days that do not even reach -10°C as daily maximum.
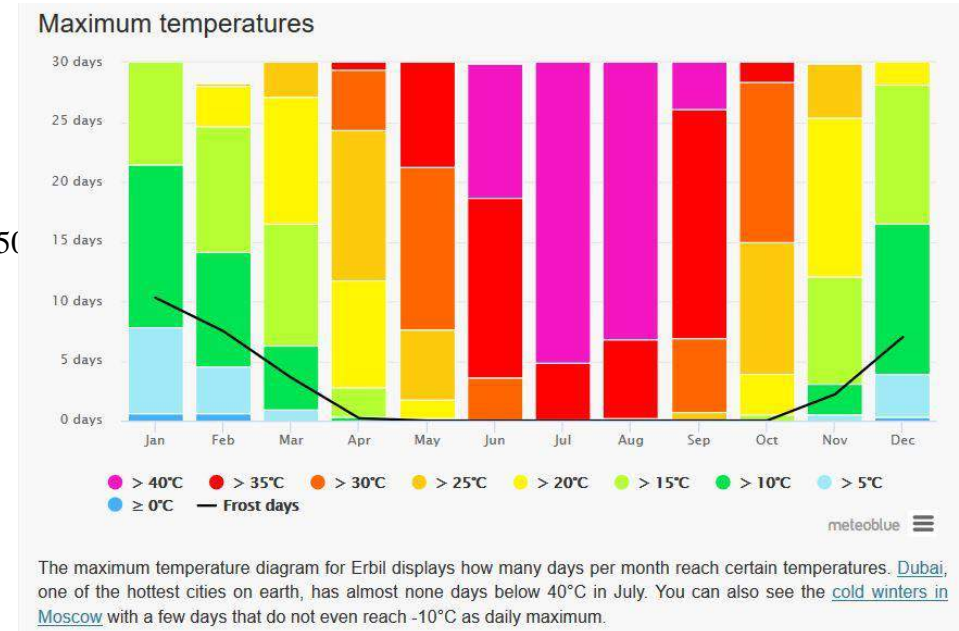
Figure 2-30

2.4.1.1 Climate of Site:

Temperature:

In spring:

- Climate in Erbil cool and some time is sun and some time rainfall.

- Month of Spring include April and may

- In Spring degree between 11.1-31.5C

Temperature:

In Autumn:

- In Autumn climate not rigid it is change rapidly most time is cloudy weather.

- Month of autumn include October and November

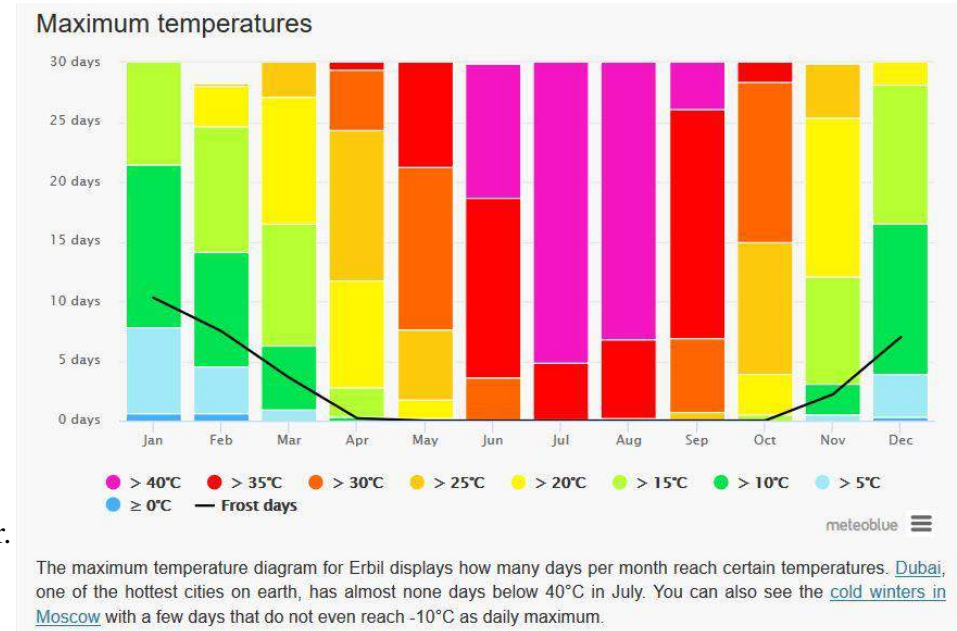- In winter degree between 8.9-30.6 C

Maximum temperatures

● > 40℃   ● > 35℃   ● > 30℃   ● > 25℃   ● > 20℃   ● > 15℃   ● > 10℃   ● > 5℃
● ≥ 0℃   — Frost days

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The maximum temperature diagram for Erbil displays how many days per month reach certain temperatures. Dubai, one of the hottest cities on earth, has almost none days below 40°C in July. You can also see the cold winters in Moscow with a few days that do not even reach -10°C as daily maximum.

Figure 2-31

2.4.1.1 Climate of Site:

Rainfall:

It is important to know level of rain in Erbil because rain has a big role in this project to calculate pips and sewerage system.

- The most of rainfall in the winter and in Erbil winter is very cold.

- Average of rainfall in the winter is (259.8) last (ten) years, max rainfall (543), min rainfall (97.8) in the last ten years
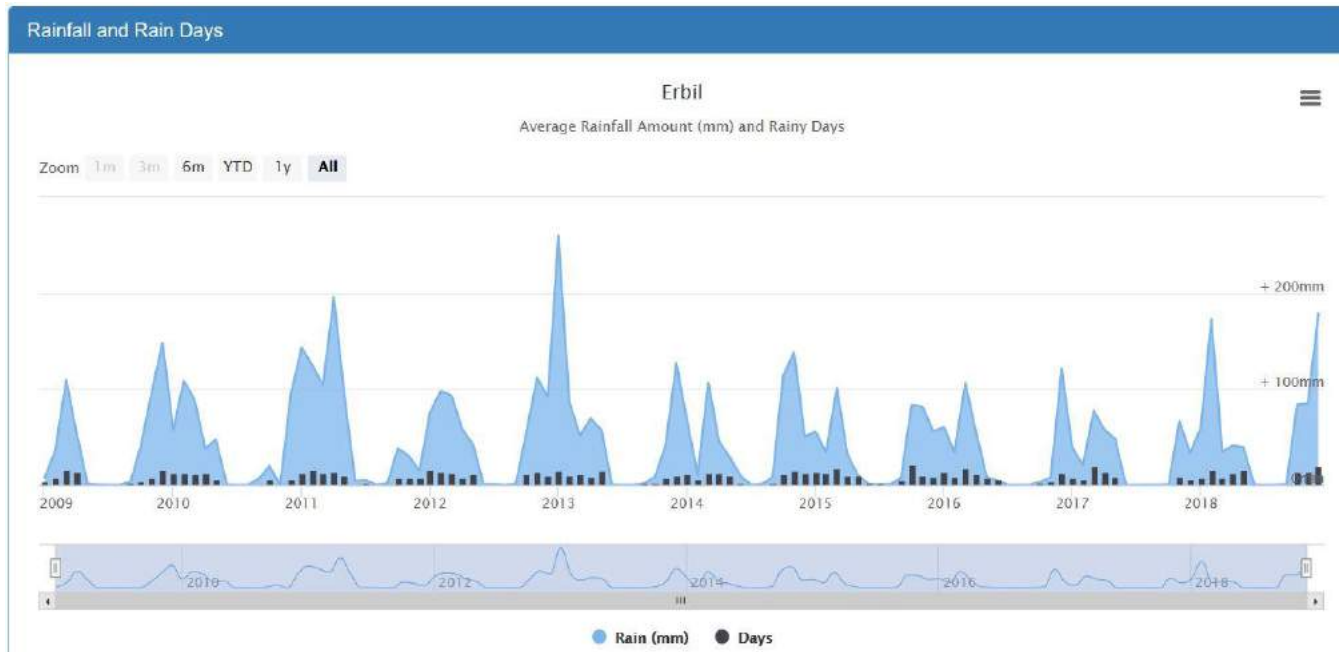
Figure 2-32

2.4.1.1 Climate of Site:

Sun:
The location of the site decide how to sun impact on the site.

In Winter:

- As can be clearly seen the two paths are different, with it been shorter and lower in the sky during winter.

In Spring:

- In spring and autumn sun position between summer and winter.

In Summer:

- As can be clearly seen the two paths are different, with it been longer and higher in the sky in summer.

In Autumn:

- In spring and autumn sun position between summer and winter.
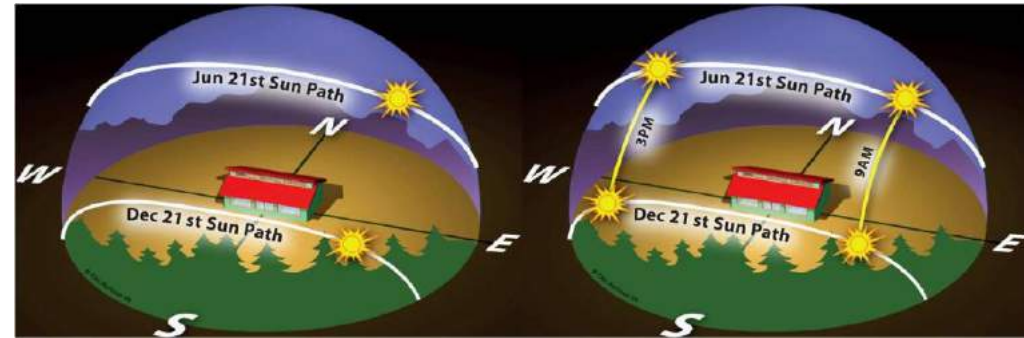
Figure 2-33
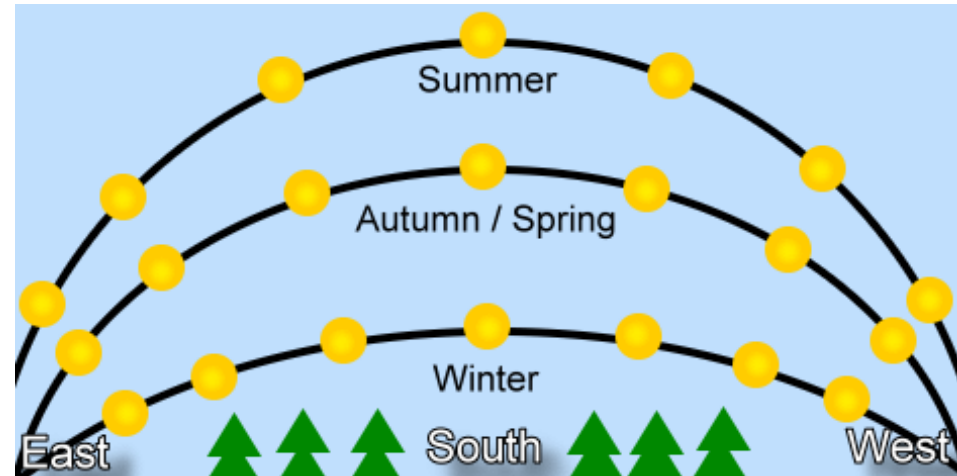
Figure 2-34

2.4.1.1 Climate of Site:

Wind:
- Wind have impact on the buildings and in this project shelters is small and structure of them not rigid like concrete or other structure.

- Wind provide ventilation for us, it is important to soft wind in site project.

In Winter:

- Max wind speed in winter is 28 km/h.

In Spring:

- Max wind speed in winter is 38 km/h.

In Summer:

- Max wind speed in winter is 28 km/h.

In Autumn:

- Max wind speed in winter is 28 km/h.

Direction of wind:
- The most wind in the North - East

The wind rose for Erbil shows how many hours per year the wind blows from the indicated direction. Example SW: Wind is blowing from South-West (SW) to North-East (NE). Cape Horn, the southernmost land point of South America, has a characteristic strong west-wind, which makes crossings from East to West very difficult especially for sailing boats.

Figure 2-36

The diagram for Erbil shows the days per month, during which the wind reaches a certain speed. An interesting example is the Tibetan Plateau, where the monsoon creates steady strong winds from December to April, and calm winds from June to October.

Wind speed units can be changed in the preferences (top right).
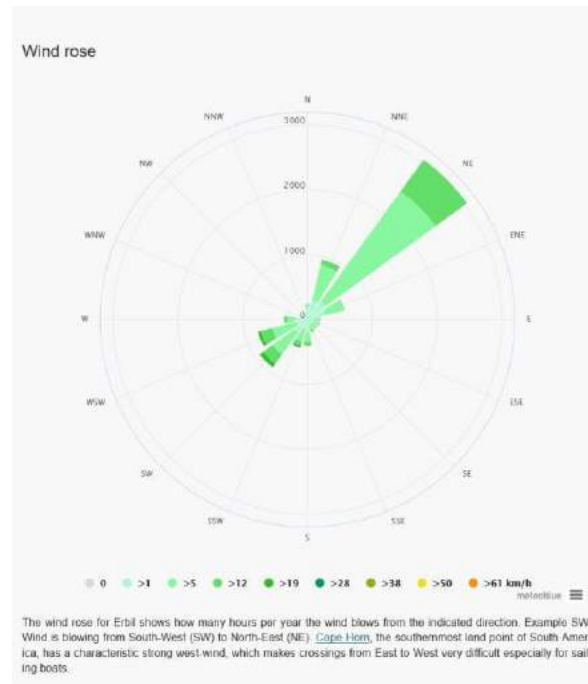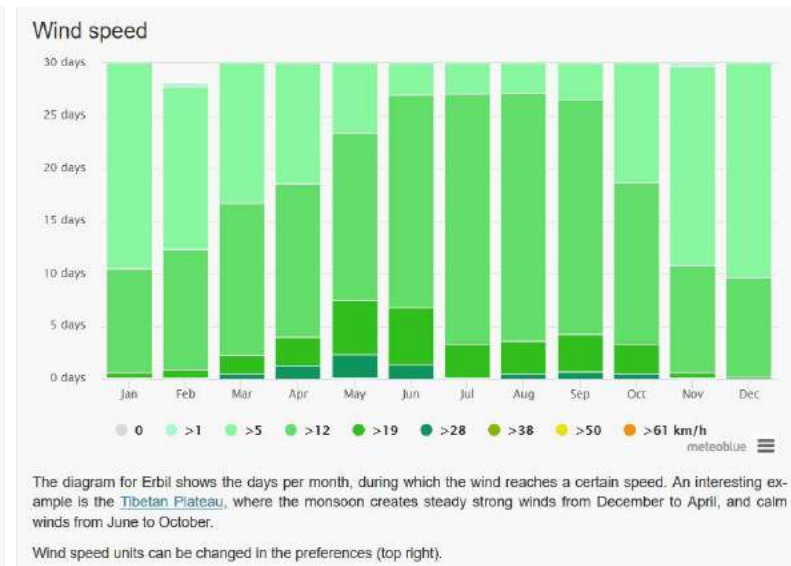
Figure 2-35

2.4.3.1 Criteria of site

- Located on old karkuk road
- The Site with municipality service
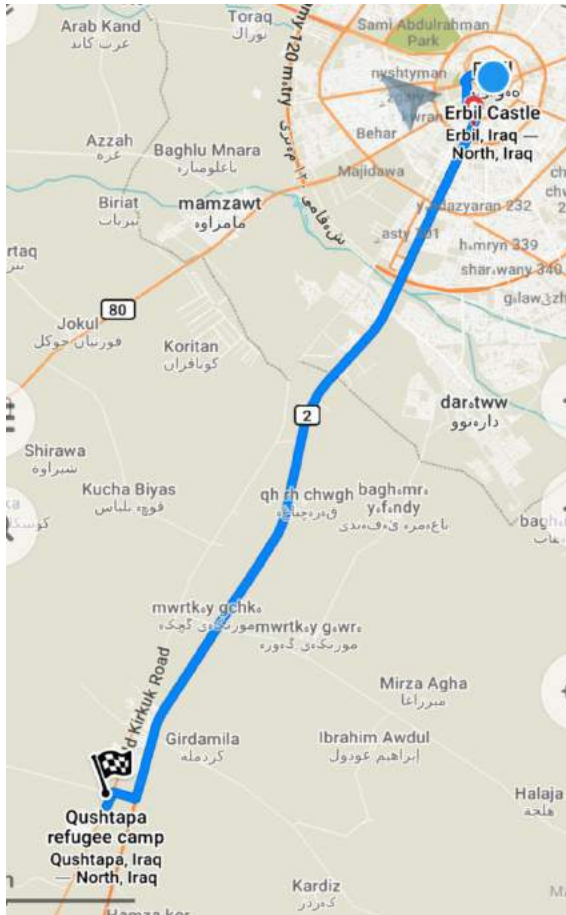- 26 km far from Erbil city center
- Accessibility is good

- Slope of the site 5m
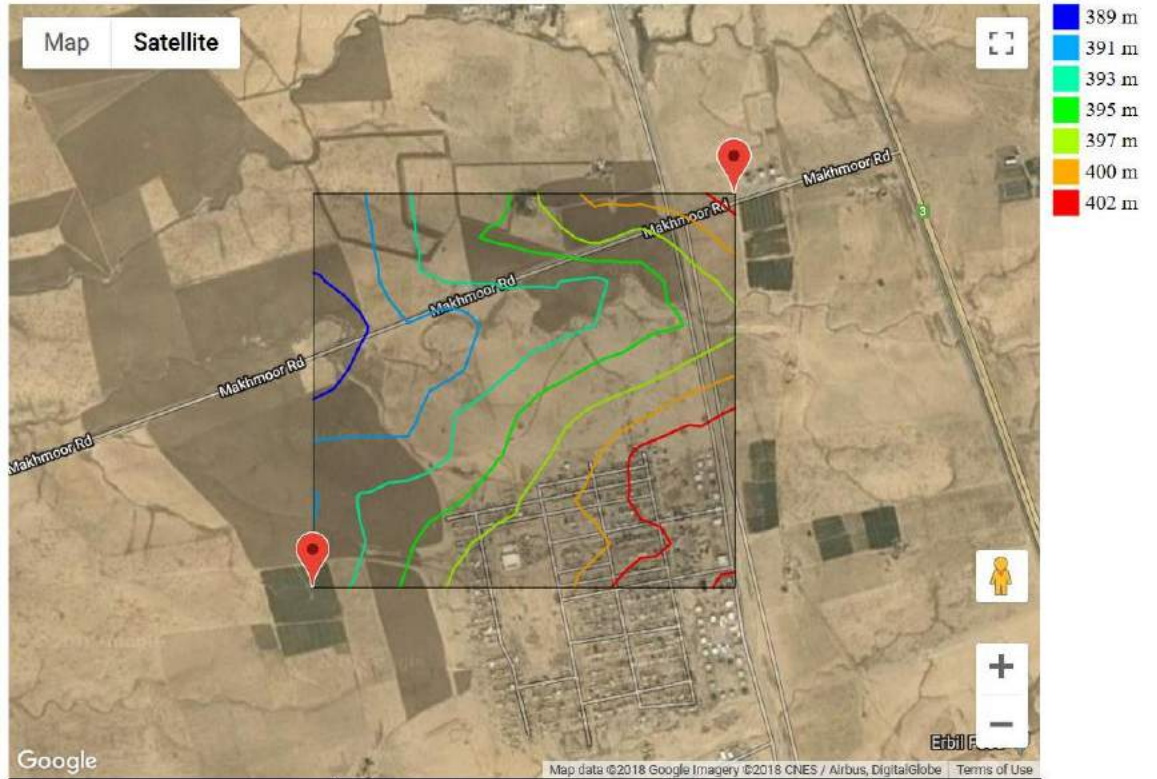

Figure 2-37

Figure 2-38

2.4.3.1 Criteria of site

- The site should be located a sufficient distance from international borders (50km), conflict zones, and other potentially sensitive areas (such as military installations).

- Far from near point of International borders approximately 140 km, and far from conflict zones, and sensitive area.

Figure 2-39

2.4.3.1 Criteria of site

- Area of site = 416, 268 msq
- Security is good
- The site have water source
- The site good for vegetation
- Government owned the site

N

Site

Main Road

Water Source

Figure 2-40

Figure 2-41

Qushtapa Refugee Camp, Erbil Governorate

UNHCR — The UN Refugee Agency

1,259 Shelter Plots Improved (Concrete Slab, Kitchen, Latrine and Shower)

480 Shelter Plots Under Construction

Example: C-10-06

C-10-06 → Block Name / Community No. / Plot No.

Block	Community	Shelter Plots	
		Actual	Planed
A	15	194	194
B	14	184	184
C	19	265	265
D	10	144	144
E	15	240	240
F	15	232	232
G	16	0	256
H	14	0	224
T	0	96	0
Total	118	1,355	1,739

Legend
- Tents
- Borehole
- UNHCR Compound
- Government Office
- UNHCR Registration Center
- Mosque
- Police and Security
- UNHCR Distribution Center
- UNHCR Primary health center
- UNICEF Primary School
- Secondary School
- WFP Food Warehouse
- UNHCR Warehouse
- Communal Latrines & Showers
- Fuel Depot
- DRC Office
- Kindergarten
- BCF Office and Warehouse
- ERC /UAE sewing Workshop
- IOM Vocational Training Center
- DRC Livelihood Project (Shops)
- Bakery
- Save The Children CFS / CPU
- IOM Shops
- INTERSOS Community Service
- Al-Waha Community Center Service Area
- Rwanga Kids Zone
- WFP Voucher Dist. Center
- UNFPA Women Center
- Fire Brigade
- ACTED CFS / CPU
- Cholera Treatment Unit (CTU)
- THW Office
- DEVAW Office
- RI Office
- Water Tank
- Market area

Design Camp Capacity : 1,739 Shelter Plots
Total Camp Area : 416,268.3 Sqm

Prepared By UNHCR Technical Unit ,V 14 ,25sep 2016

0   100   200 meters

2.5 Evaluation Alternatives

Table 2-1

Standard	Weight	Site No. 1		Site No. 2		Site No 3	
Topography, drainage, Soil conditions	5	1	5	2	10	3	15
Water resources	5	3	15	1	5	2	10
Land Rights	3	2	6	1	3	3	9
Accessibility	4	3	12	1	4	2	8
Security	5	1	5	3	15	2	10
Environment And Vegetation	3	3	9	1	3	2	6
total			52		40		58

- **Site number 3 got higher value from other sites the it will be best alternative for project.**

CHAPTER 3

Similar Examples

3.1 Introduction:

This chapter explain some of the local and international examples and each one of the example has benefit for project and help the project to be useful.

3.2 Local Similar Examples:

Local examples help the project to understand environmentally and culturally to create comfortable environment for refugees and the researcher visited the local camps to identify and detect problems related to camp designing and planning.
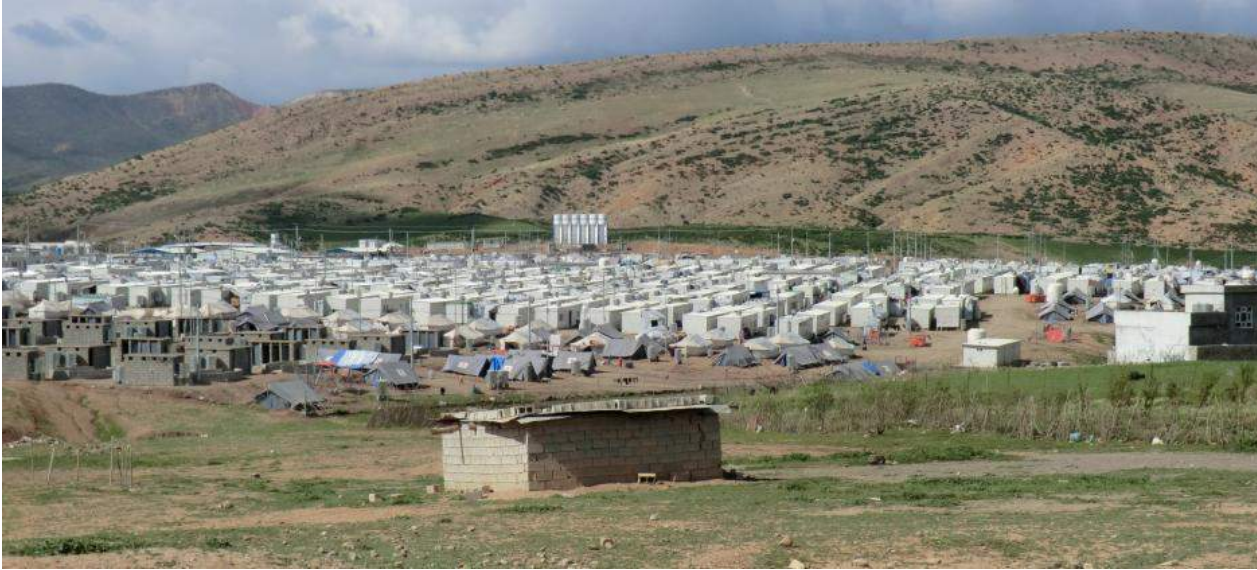
Figure 3-1

3.2.1.1 kawrgosk camp

Kawrgosk site located in the North-West of the Erbil city, near kawrgosk
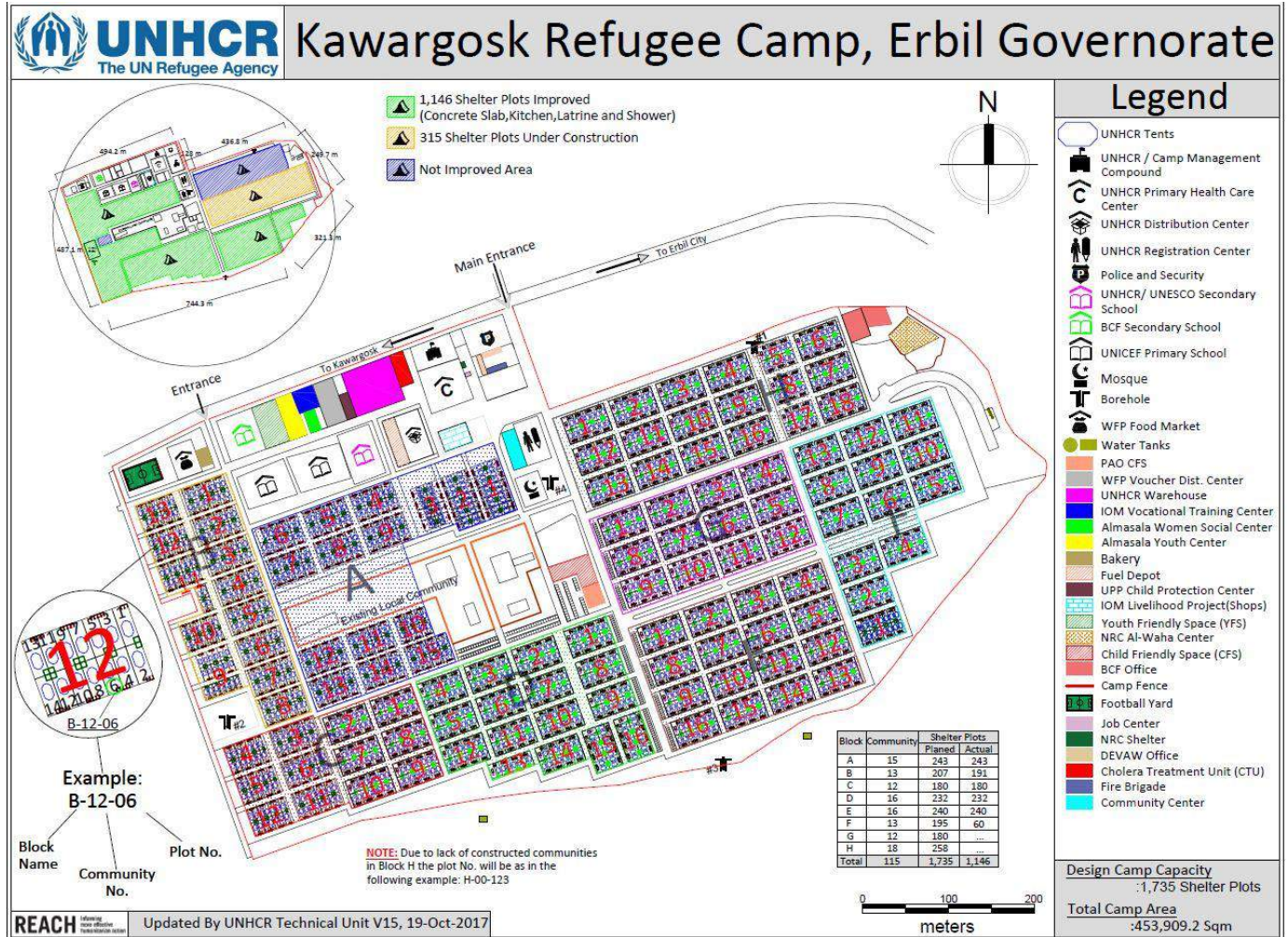
Figure 3-2

3.2.1.2 kawrgosk camp Street Pattern

Figure 3-3

Main Entrance

Entrance

Existing Local Community

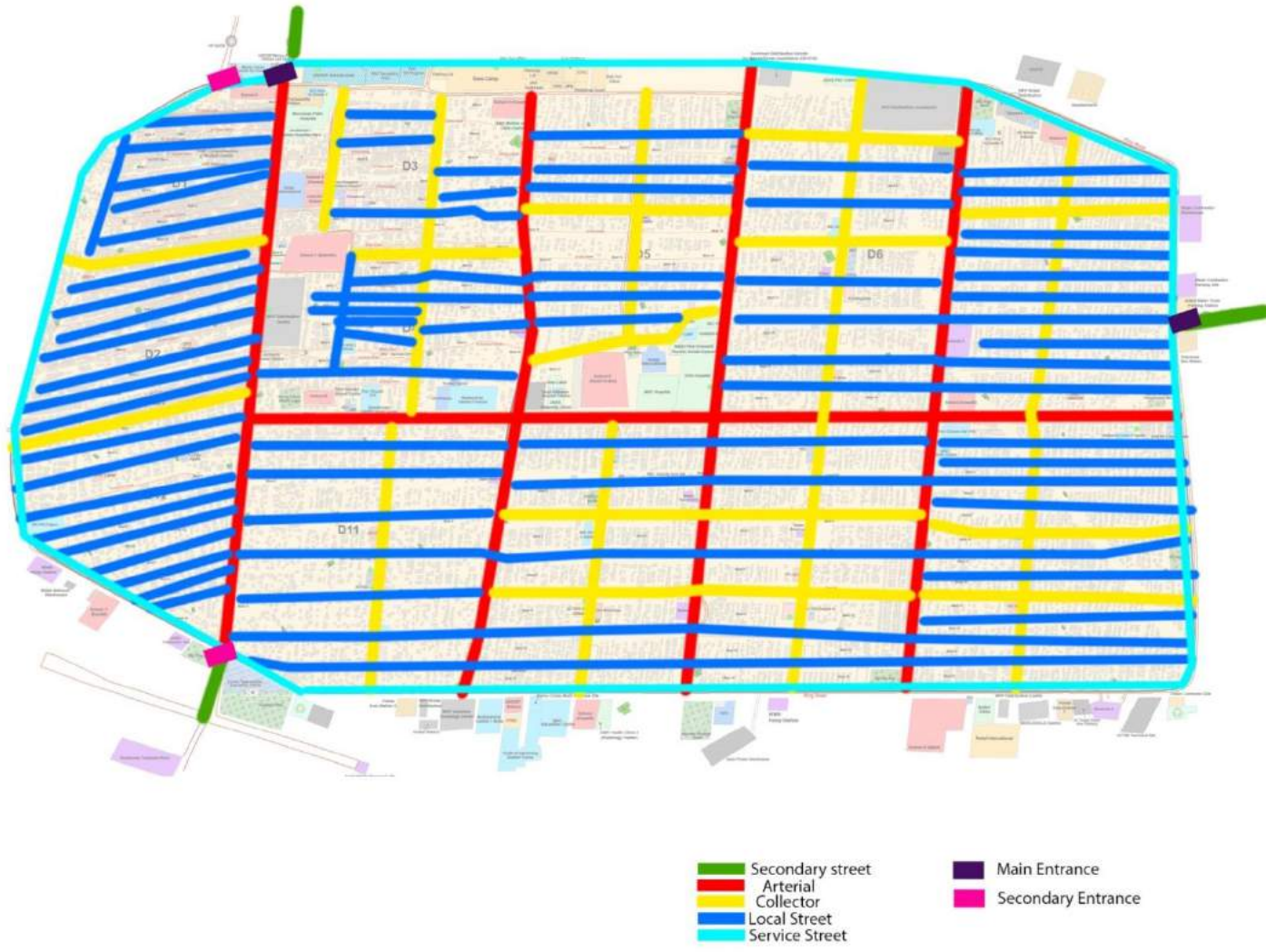| | Highway | | Main Entrance |
	Arterial		Secondary Entrance
	Collector		
	Local Street		
	Service Street		

3.2.1.3 kawrgosk camp Zone

Shelters and Facility zones
Total Area = 453,909 msq
Shelters Area= 359,554 msq
Facilities & Administration Area = 94,355 msq

Ratio shelters to Facilities & Administration
= 359,554 / 94,335 = 3.8

Total Area = 453,909 msq
Total population = 7,986

Total area / total population = area of each person

453,909/7,986 = 56.8 = 57

Figure 3-4

Shelters
Facilities & Admin.
Main Entrance
Secondary Entrance

3.2.2.1 Qushtapa camp

Qushtapa site located in the South of the Erbil city, near Qushtapa
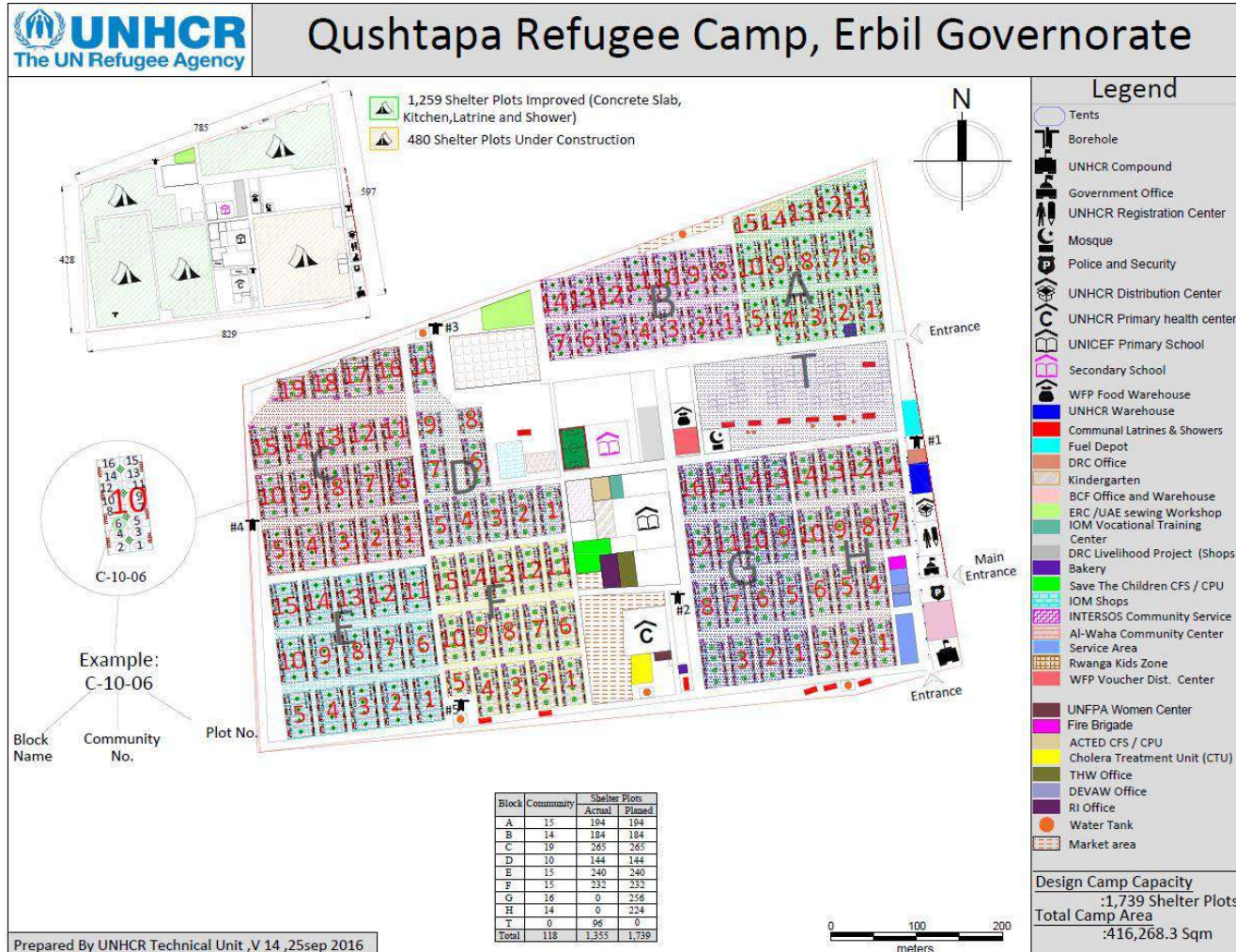
Figure 3-5

Figure 3-6

	Highway		Main Entrance
	Arterial		Secondary Entrance
	Collector		
	Local Street		
	Service Street		

Shelters and Facility zones
Total Area = 416,268 msq
Shelters Area= 294,660 msq
Facilities & Administration Area = 121,608 msq

Ratio shelters to Facilities & Administration
= 294,660 / 121,608 = 2.4

Figure 3-7

Total Area = 416,286 msq
Total population = 7,900

Total area / total population = area of each person

416,268/7,900 = 52.7 = 53
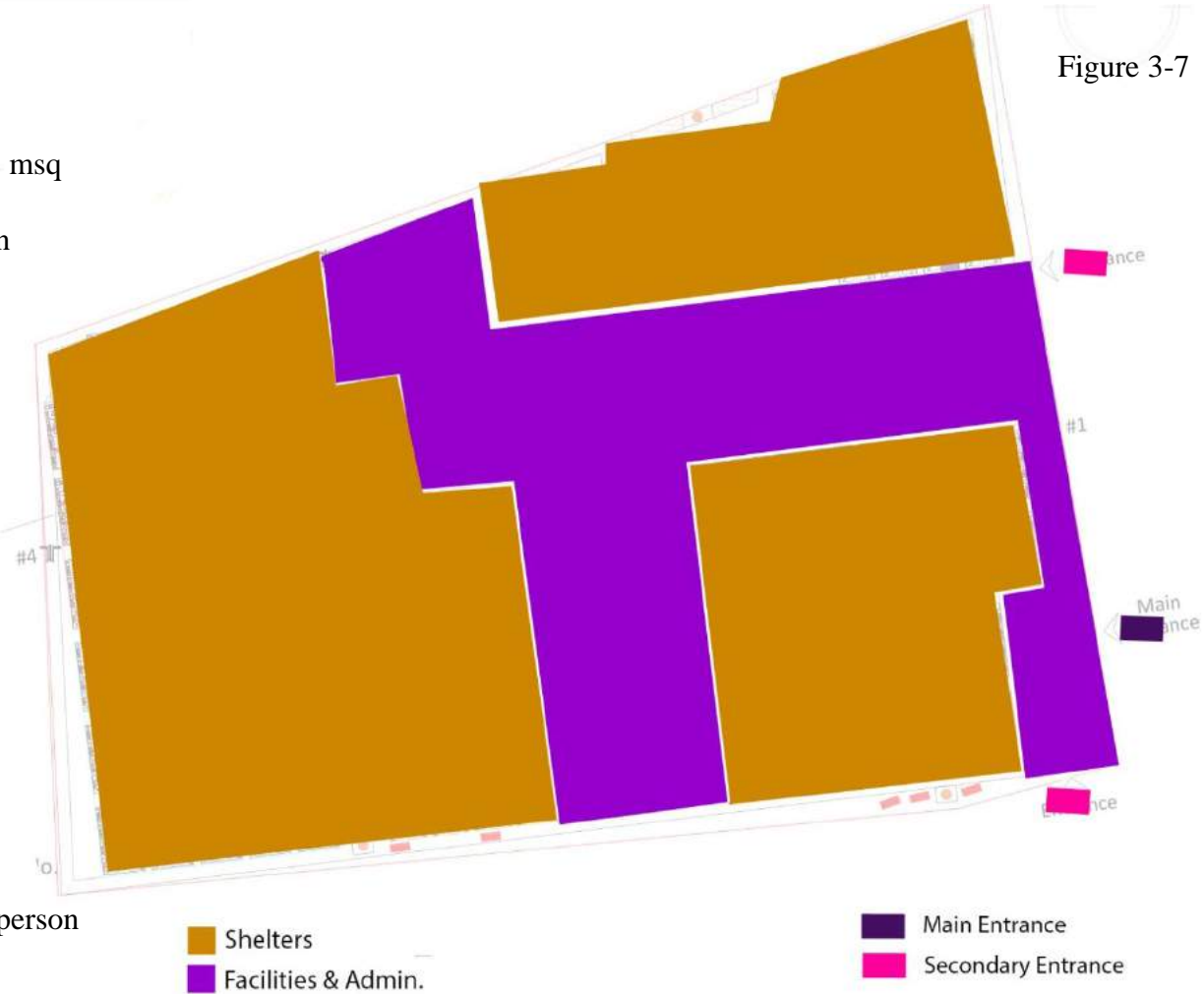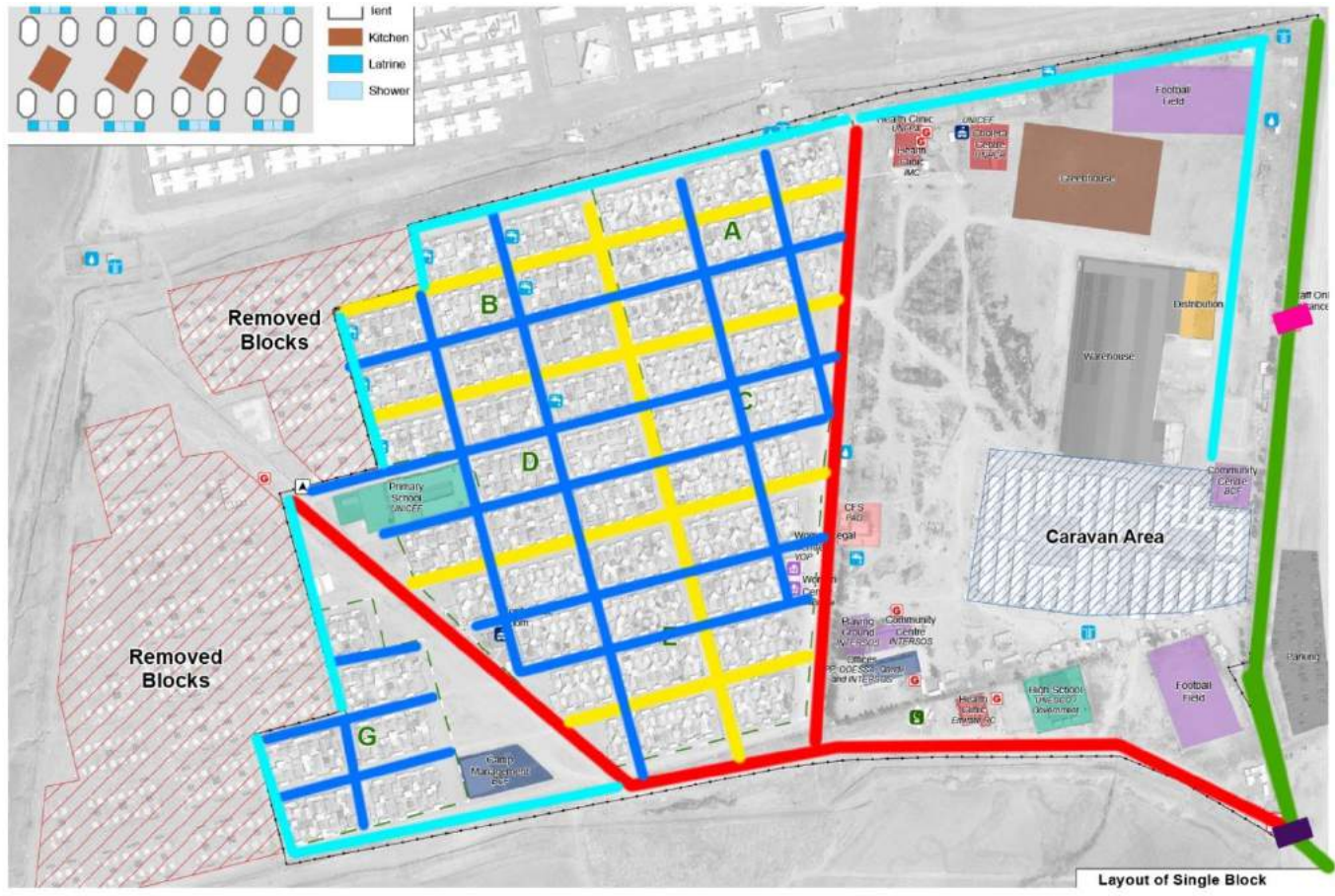
Shelters

Facilities & Admin.

Main Entrance

Secondary Entrance

3.2.3.1 Bahrka camp

Bahrka site located in the North of the Erbil city, om Bahrka road

Figure 3-8

Figure 3-9

3.2.3.3 Bahrka camp

Shelters and Facility zones
Total Area = 307,087 msq
Shelters Area= 219,348 msq
Facilities & Administration Area = 87,739 msq

Ratio shelters to Facilities & Administration
= 219,348 / 87,739 = 2.5

Total Area = 307,087 msq
Total population = 3,953

Total area / total population = area of each

307,087 / 3,953 = 77.7 = 78

Tent
Kitchen
Latrine
Shower

Health Clinic

Caravan Area

Layout of Single Block

Shelters
Facilities & Admin.

Main Entrance
Secondary Entrance

3.3 International Similar Example

The international similar example show us how to solve the problems with a lot of refugees.

3.3.1 Zaatari Camp

Zaatari camp is second biggest camp in the world located in the Jordan.

Figure 3-11

Figure 3-12

Secondary street	Main Entrance
Arterial	Secondary Entrance
Collector	
Local Street	
Service Street	

Shelters and Facility zones
Total Area = 6,629,047 msq
Shelters Area= 5,297,154 msq
Facilities & Administration Area = 1,331,893 msq

Ratio shelters to Facilities & Administration
= 5,297,154 / 1,331,893 = 3.9

Figure 3-13

Total Area = 6,629,047 msq
Total population = 78,994

Total area / total population = area of each person

6,629,047 /78,994 = 83.9 = 84

Shelters

Facilities & Admin.

Main Entrance

Secondary Entrance

3.3.5.1 Reyhanly Camp

Reyhanly camp located in the turkey and syrian refugees living in camp.

Figure 3-14

3.3.5.2 Reyhanly Camp Street Pattern

Figure 3-15

Legend:
- Highway (green)
- Arterial (red)
- Collector (yellow)
- Local Street (blue)
- Service Street (cyan)
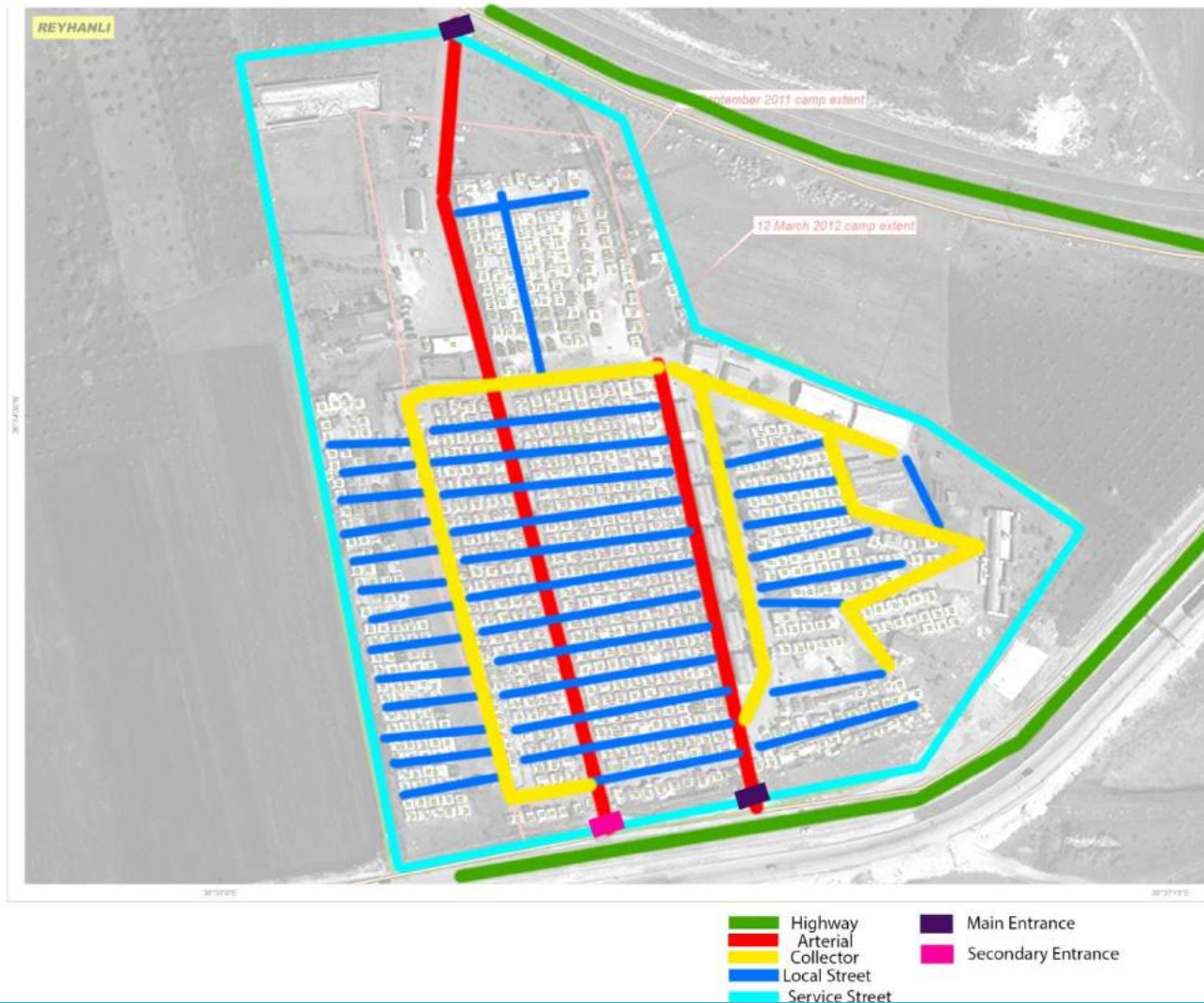- Main Entrance (dark purple)
- Secondary Entrance (magenta)

3.3.5.3 Reyhanly Camp Zones

Shelters and Facility zones
Total Area = 116,354 msq
Shelters Area= 82,997 msq
Facilities & Administration Area = 33,357 msq

Ratio shelters to Facilities & Administration
= 82,997 / 33,357 = 2.7

Figure 3-16

Shelters
Facilities & Admin.

Main Entrance
Secondary Entrance

Total Area = 116,354 msq
Total population = 1,756

Total area / total population = area of each person

116,354 /1,790 = 65

3.4 Comparison Between Examples

Table 3-1

No.	Name of Camp	Location	Nation	Total Area msq	Population	Area Of Each person	Shelter/ Facilities
1.	Kawrgosk	Iraq/Erbil	Syrian	453,909	7,968	59	3.8
2.	Qushtapa	Iraq/Erbil	Iraqi	416,268	7,900	52.7	2.4
3.	Bahrka	Iraq/Erbil	Iraqi	307,087	4,200	73.1	2.5
4.	Zaatari	Jordan/ Mafraq	Syrian	6,629,047	78,908	84	3.9
5.	Reyhanly	Turkey/ Hatay	Syrian	116,354	1790	65	2.7

3.5 Similar Example Of Units

Unit is one of the important in this project, in this part explain three shelters to show previous works.

3.5.1 Weaving Home

'weaving a home' by jordanian/canadian designer abeer seikaly proposes a disaster shelter for refugees that is based on temporary huts of nomadic tribes. the use of structural fabric references ancient traditions of joining linear fibers to make complex three-dimensional shapes the resulting pattern is easy to erect and scale into various functions, from a basket to a tent. the project incorporates technological advances and new methods of assembly of the material, envisioning a system composed of durable plastic members that are threaded to form a singular unit. these flexible envelopes fold across a central axis, with the hollow structural skin enabling necessities such as water and electricity to run through it, similar to a typical stud wall.

Figure 3-17

3.5.1 Weaving Home

Exposure to the surrounding elements can be controlled by manipulating the units into different scales and opening and closing the exterior skin. the lightweight, structural fabric seeks to help people weave their lives back together, as they construct the mobile pieces into a home.

Figure 3-18

Figure 3-19

3.5.1 Weaving Home

Interior view of the tent when open, the layered skin provides pockets for storage.

Figure 3-20

3.5.1 Weaving Home
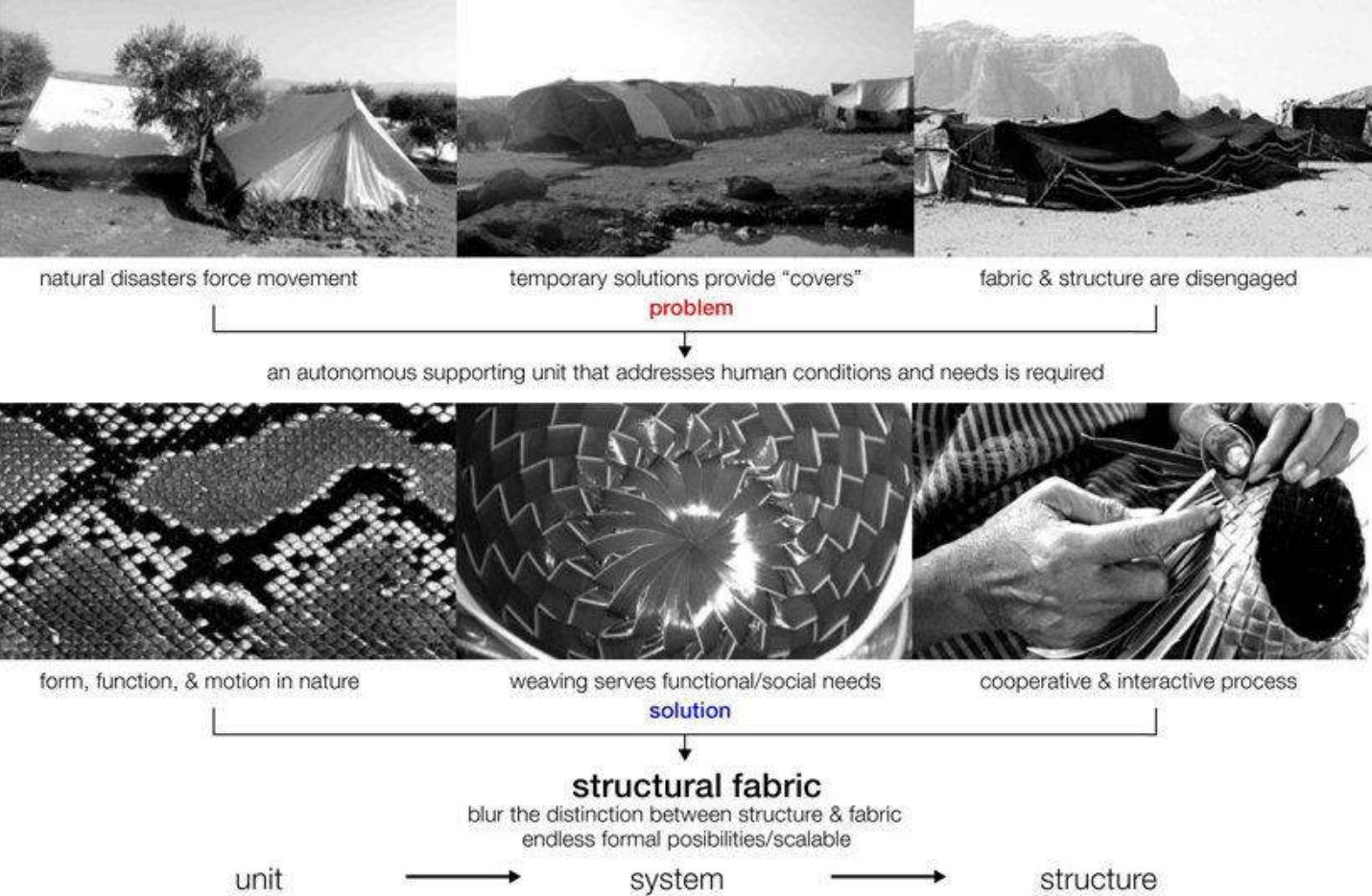
Concept And Diagram of Weaving Home

Figure 3-21

natural disasters force movement   temporary solutions provide "covers"   fabric & structure are disengaged

problem

an autonomous supporting unit that addresses human conditions and needs is required

form, function, & motion in nature   weaving serves functional/social needs   cooperative & interactive process

solution

structural fabric
blur the distinction between structure & fabric
endless formal posibilities/scalable

unit   ⟶   system   ⟶   structure

Concept And Diagram of Weaving Home

supporting system (solar energy)
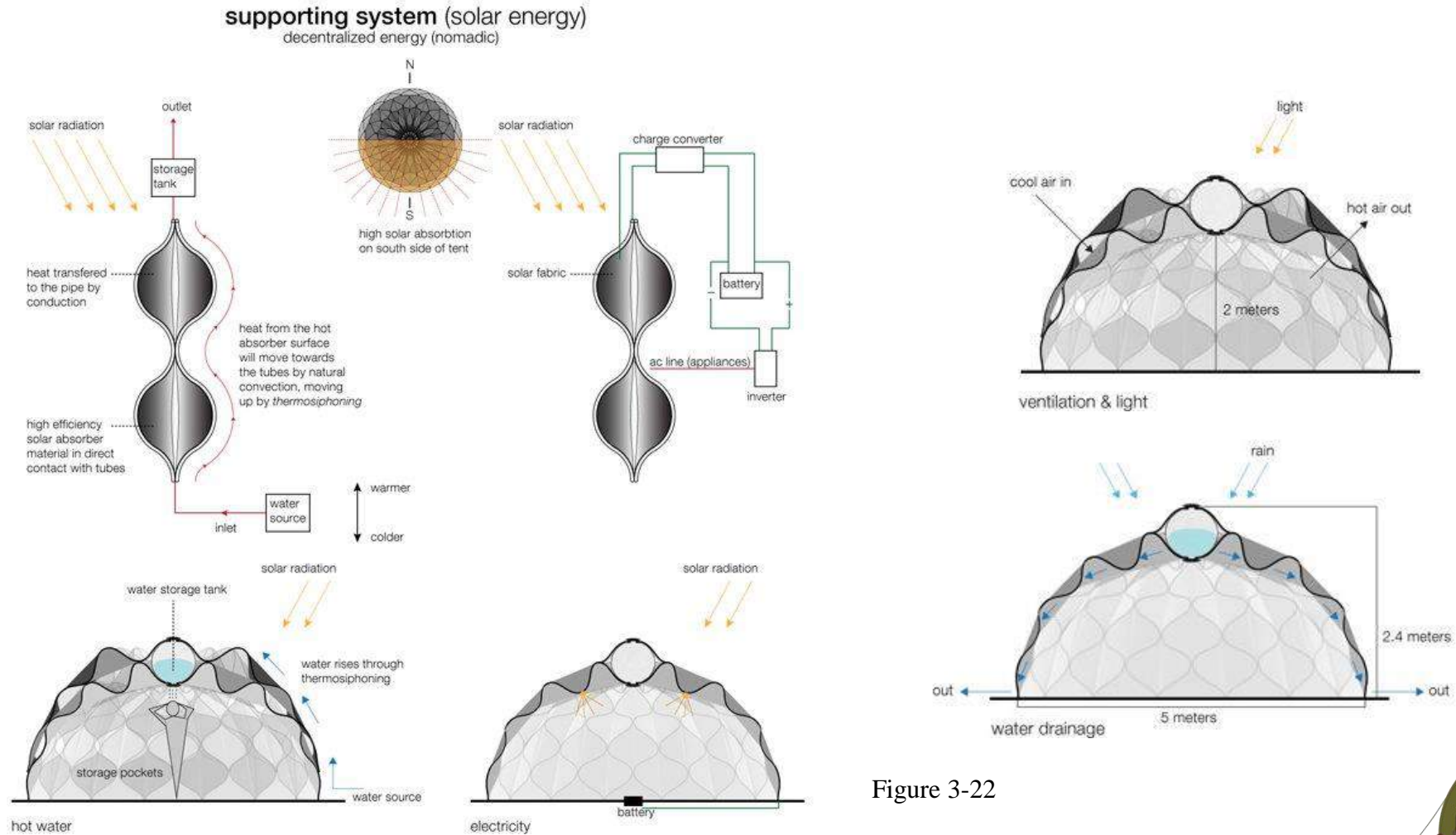decentralized energy (nomadic)

Figure 3-22

3.5.2 Reusable, stackable Exo emergency shelters

That the solar-powered collapsible shelters potentially provide some sense of security and ownership to the person who owns them, or the fact that it could make a great tent for festivals, is perhaps what makes Abeer Seikaly's design so compelling.

Figure 3-23

Figure 3-24

3.5.2 Reusable, stackable Exo emergency shelters

But sometimes in emergency situations, aid workers find themselves faced with hundreds or thousands of people who were very suddenly displaced from their homes – either by natural disaster or a sudden eruption of violence.

Figure 3-25

Figure 3-26

3.5.2 Reusable, stackable Exo emergency shelters

Aesthetics, which is why tents have always been the go-to solution for disaster relief organizations. It is very challenging to transport a large volume of decent, insulated structures that not only provide shelter against the elements, but also protection from opportunistic criminals.
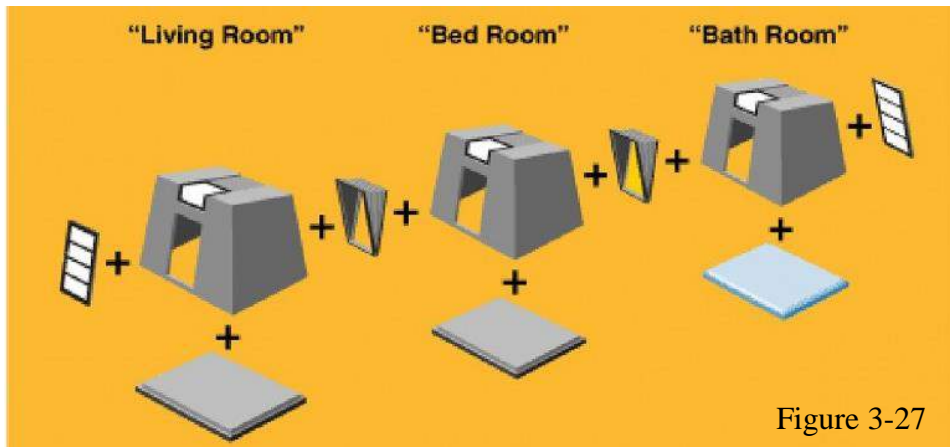

Figure 3-27

Figure 3-28

Figure 3-29

3.5.3 Hex House

Called the Hex House, the 431-square-foot (40-square-metre) unit is largely made of steel-and-foam Structural Insulated Panels (SIPs), which can be flat-packed and delivered by truck to a building site.

Figure 3-30

3.5.3 Hex House

The shelters can be arranged in various ways and can be combined with exterior gardens, courtyards, driveways and pedestrian paths.

Figure 3-31

3.5.3 Hex House

The shelters can be arranged in various ways and can be combined with exterior gardens, courtyards, driveways and pedestrian paths.

Figure 3-32

Figure 3-34

Figure 3-33

Figure 3-35

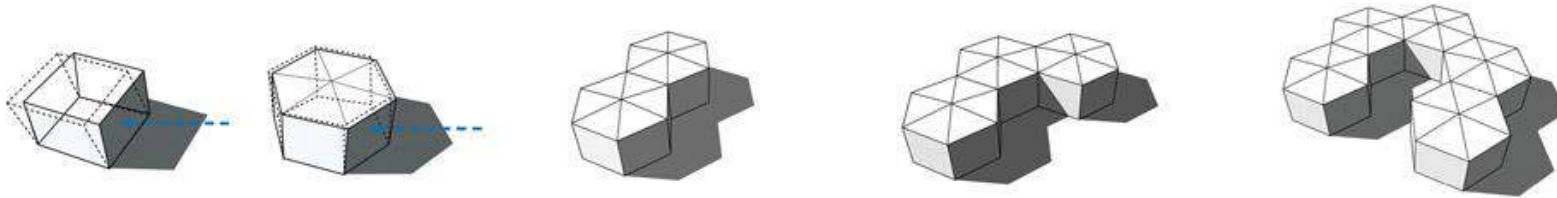### 3.5.3 Hex House

Interior view of hex house

Figure 3-36

3.5.3 Hex House
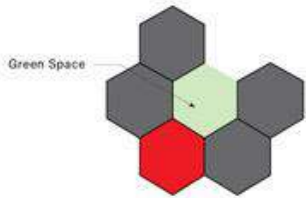
Concept And Diagram

Figure 3-37

Structural Form

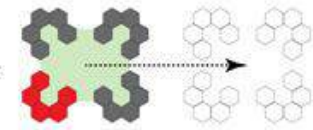Relative to the cube the hexagonal form is inherently more structurally stable without added structure.

Generative Clustering

The 40 SM hexagonal plan can be combined into various combinations of clusters that enclose shared green space.
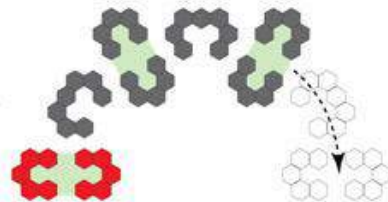
Green Space

Linear Clusters Urban Grid
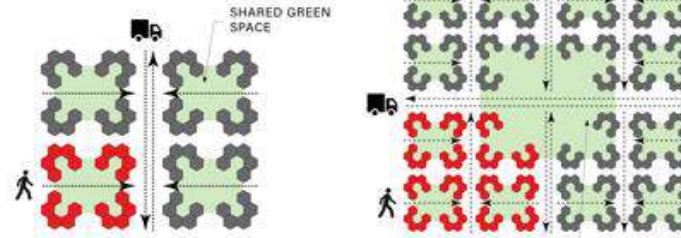
Urban Planning Flexibility

The 40 SM hexagonal plan can be combined into various combinations of clusters that enclose shared green space. Whether linear or radial, these clusters can be oriented to allow for accessible drives and pedestrian walkways.

Radial Clusters Urban Grid

SHARED GREEN SPACE

Pedestrian access happens across the shared green space and the 4M passage between clusters. Vehicles circulation happens in the 8M corridor between clusters.
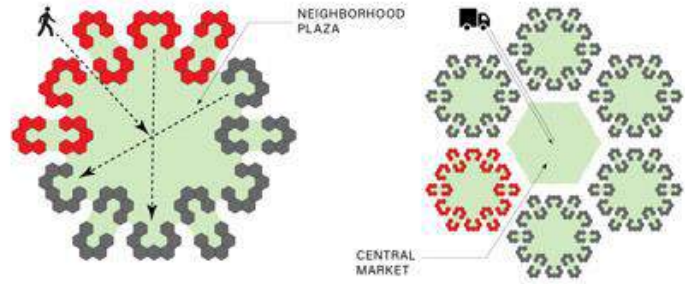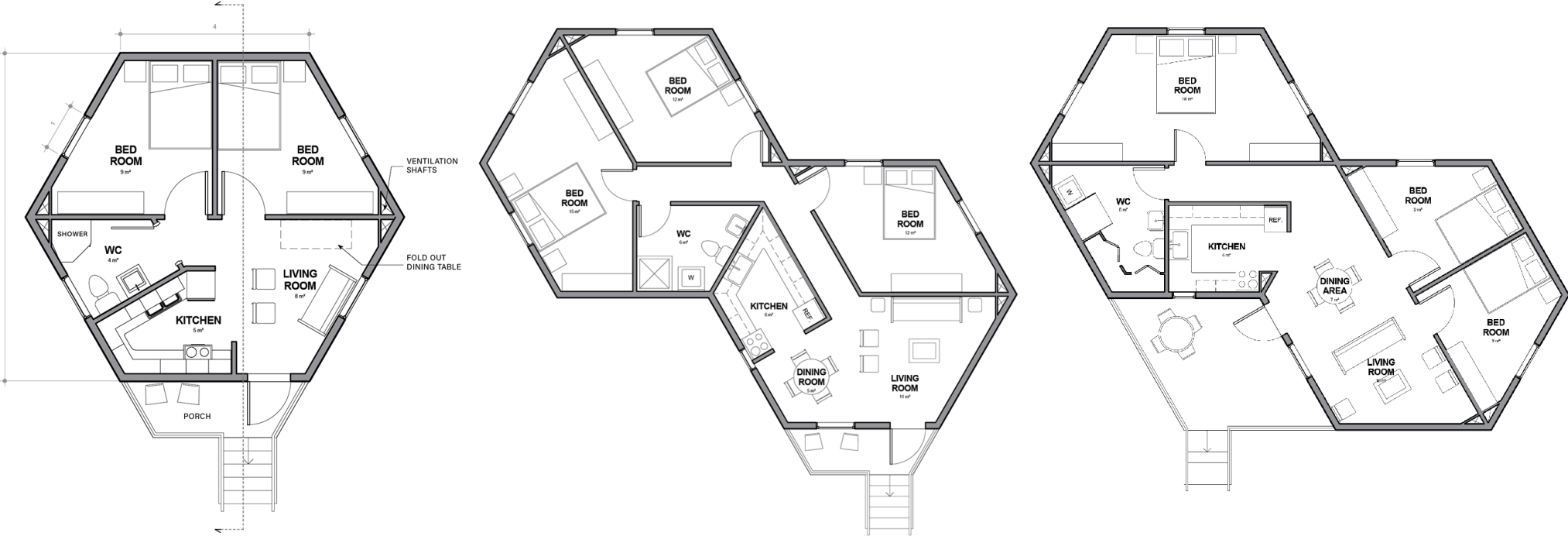
CENTRAL MARKET

NEIGHBORHOOD PLAZA

CENTRAL MARKET

Plans of hex house

Figure 3-38

3.5.3 Hex House

Section and 3D component
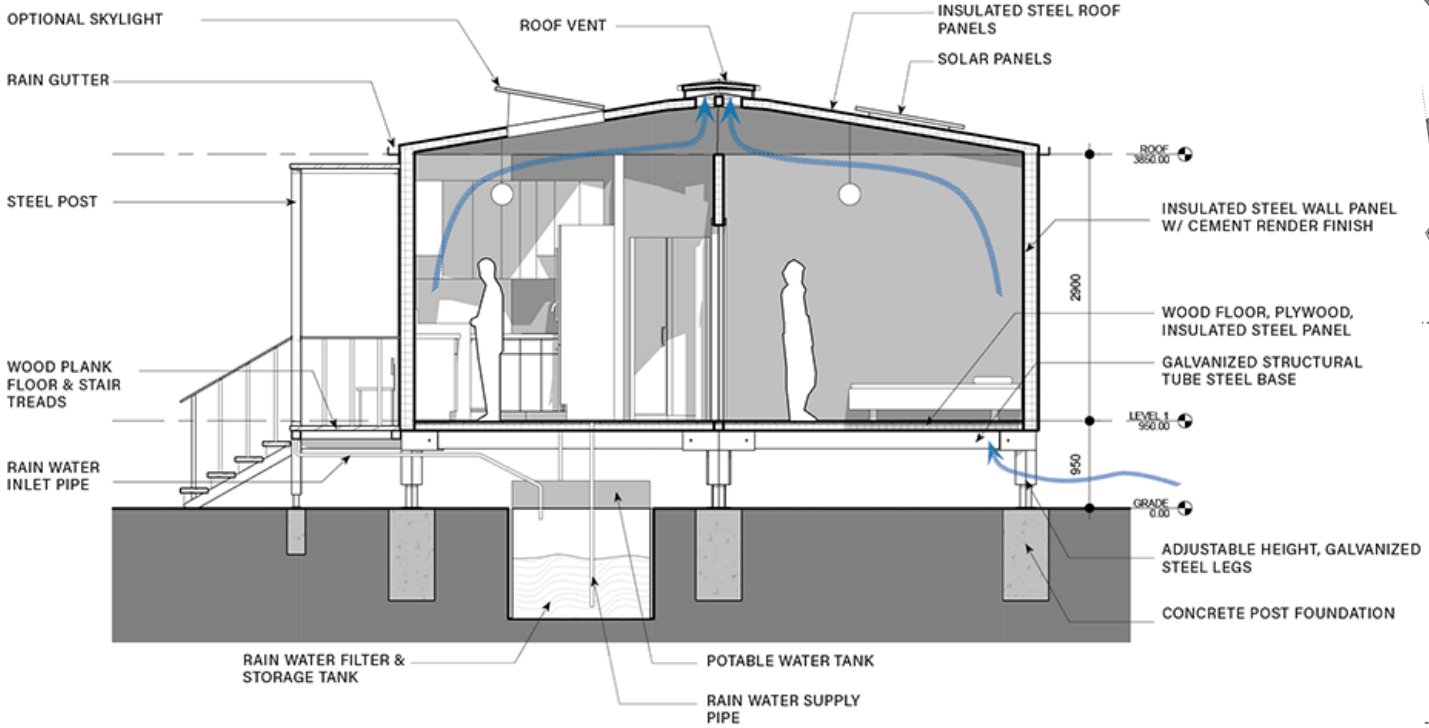
Figure 3-39
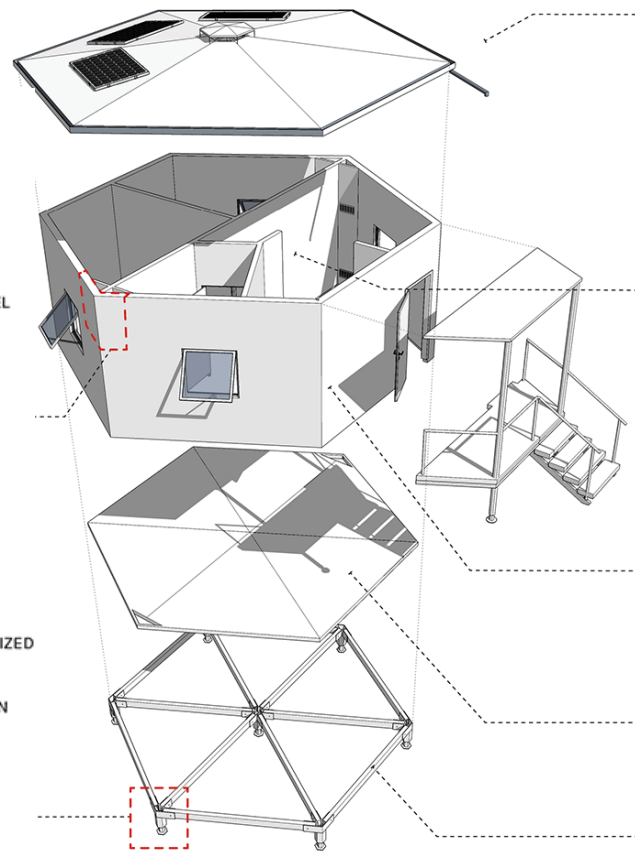
Figure 3-40

CHAPTER 4

Main Components & Relationships

4.1 Introduction :

This chapter explain components and show relationship between all of that components, and this chapter determine space program.

4.2 Components :

Component is a part of whole, and project has some components which each one completing other and all of them serving the project.

- Shelters
- Fire Safety
- Latrine
- Shower
- Water Tab Stand
- Rubbish container 100 liter
- Refuse Pit
- Health Center
- School
- Distribution Center
- Market Place
- Feeding Center
- Storage Area
- Registration
- Administration
- Security
- Mosque
- Kitchen
- Motivation Center

Figure 4-1

4.2.1.1 Main Components :

- Shelters
- Fire Safety
- Latrine
- Shower
- Refuse Pit
- Health Center
- School
- Distribution Center
- Market Place
- Feeding Center
- Registration
- Administration
- Security
- Mosque
- Kitchen
- Motivation Center

4.2.1.2 Secondary Components :

- Water Tab Stand
- Rubbish container 100 liter
- Storage Area
- Recreation Area
- Offices
- Gathering places

Figure 4-2

4.2.2 Components:

Figure 4-3
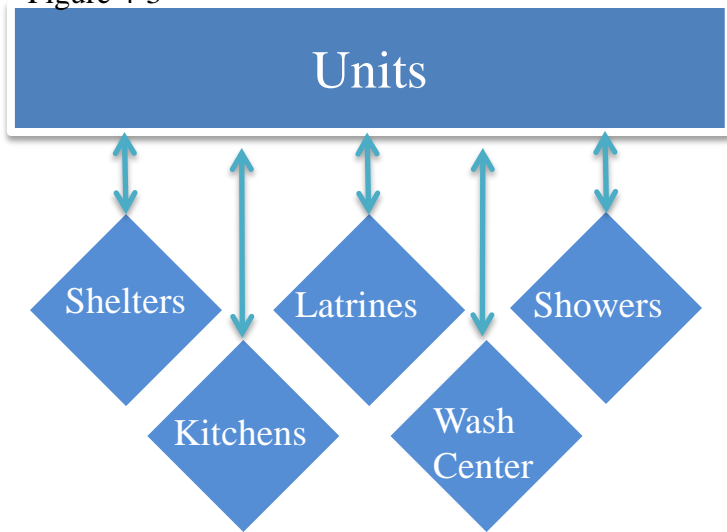
```
Units
├── Shelters
├── Kitchens
├── Latrines
├── Wash Center
└── Showers
```

Figure 4-4

```
Facilities
├── Market
├── Mosque
├── School
├── Distribution
├── Recreation
├── Health Center
├── Feeding Center
├── Motivation Center
└── Gathering Place
```

Figure 4-5

```
Administration
├── Security
├── Registration
├── Offices
└── Fire Safety
```
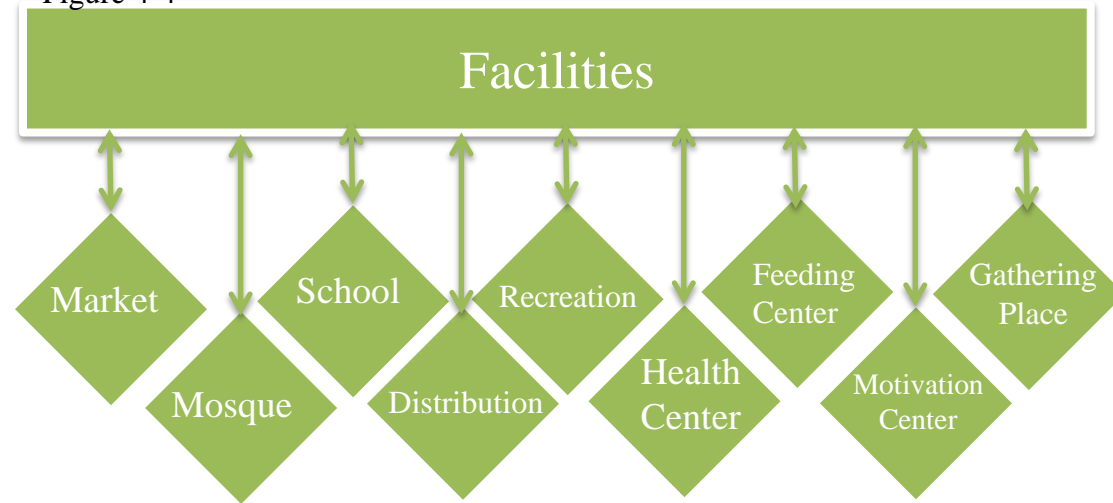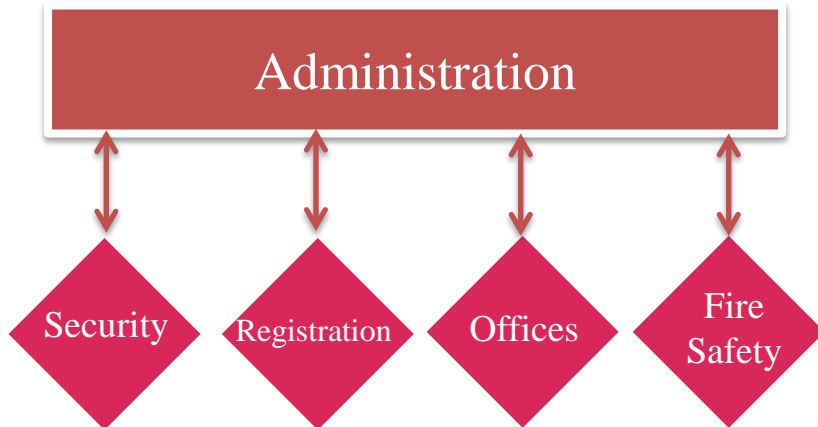
Graphical tool that shows the connection or correlation between ideas or issues in the form of a table (matrix). A relationship is indicated at each intersection of rows and columns as present or absent. (Business Dictionary).

The matrix table show the relation between all components which the relation(weak, medium and strong).
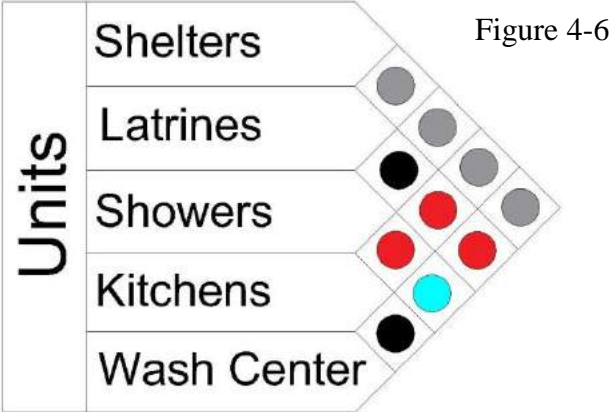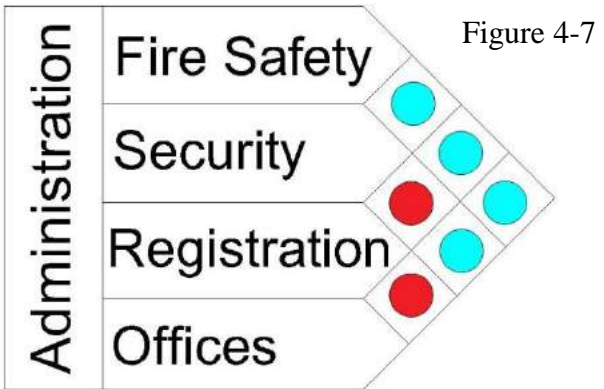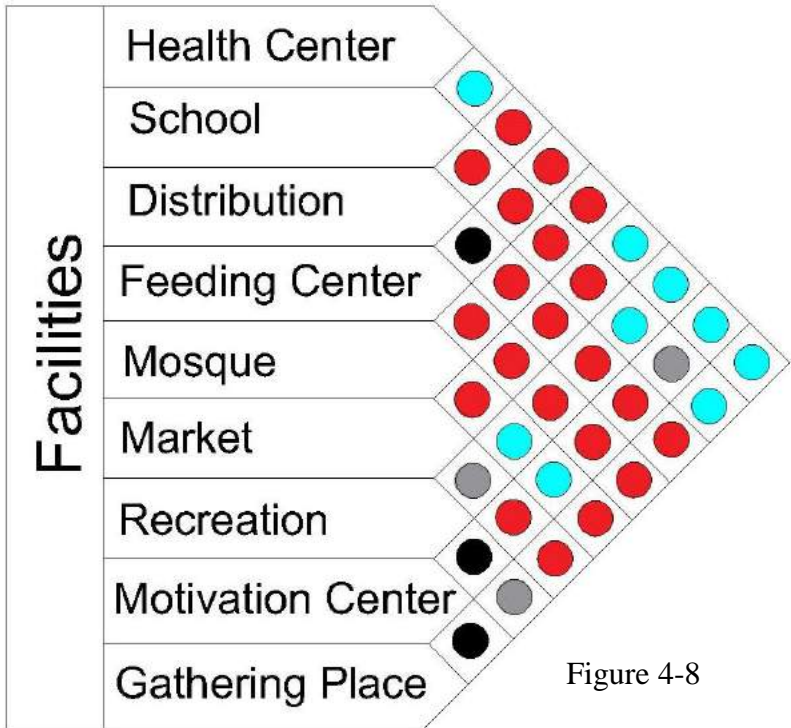
Figure 4-6

Figure 4-7

Figure 4-8

Figure 4-9

Bubble diagram inside of (Units)

Units

Latrines

Shelters

Showers

Wash Center

Kitchens

——— Weak

━━━ Medium

━━━ Strong
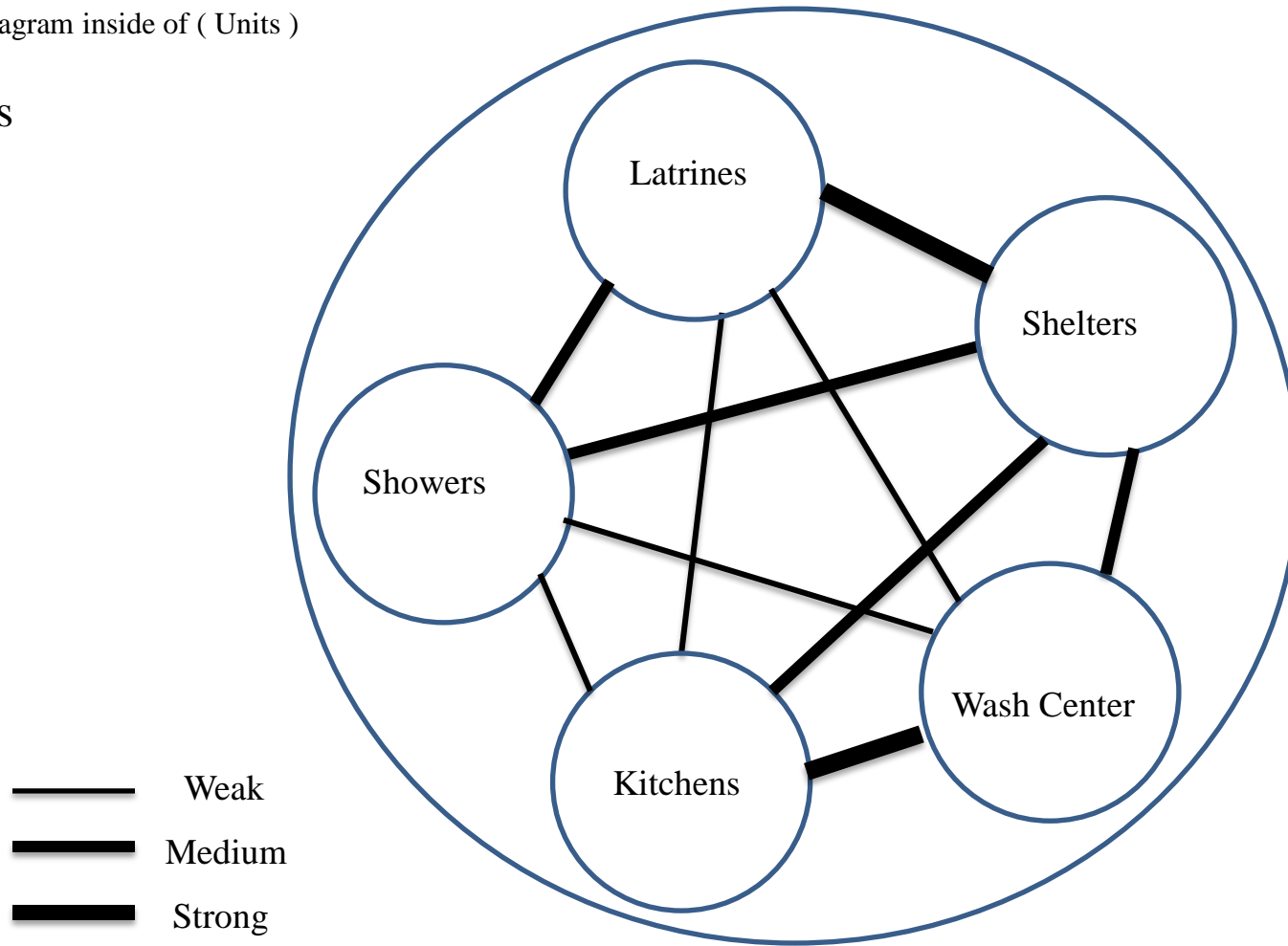
Bubble diagram inside of (Administration)

Figure 4-10

Administration

Fire Safety

Security

Offices

Registration

——— Weak

▬▬▬ Medium

▬▬▬ Strong
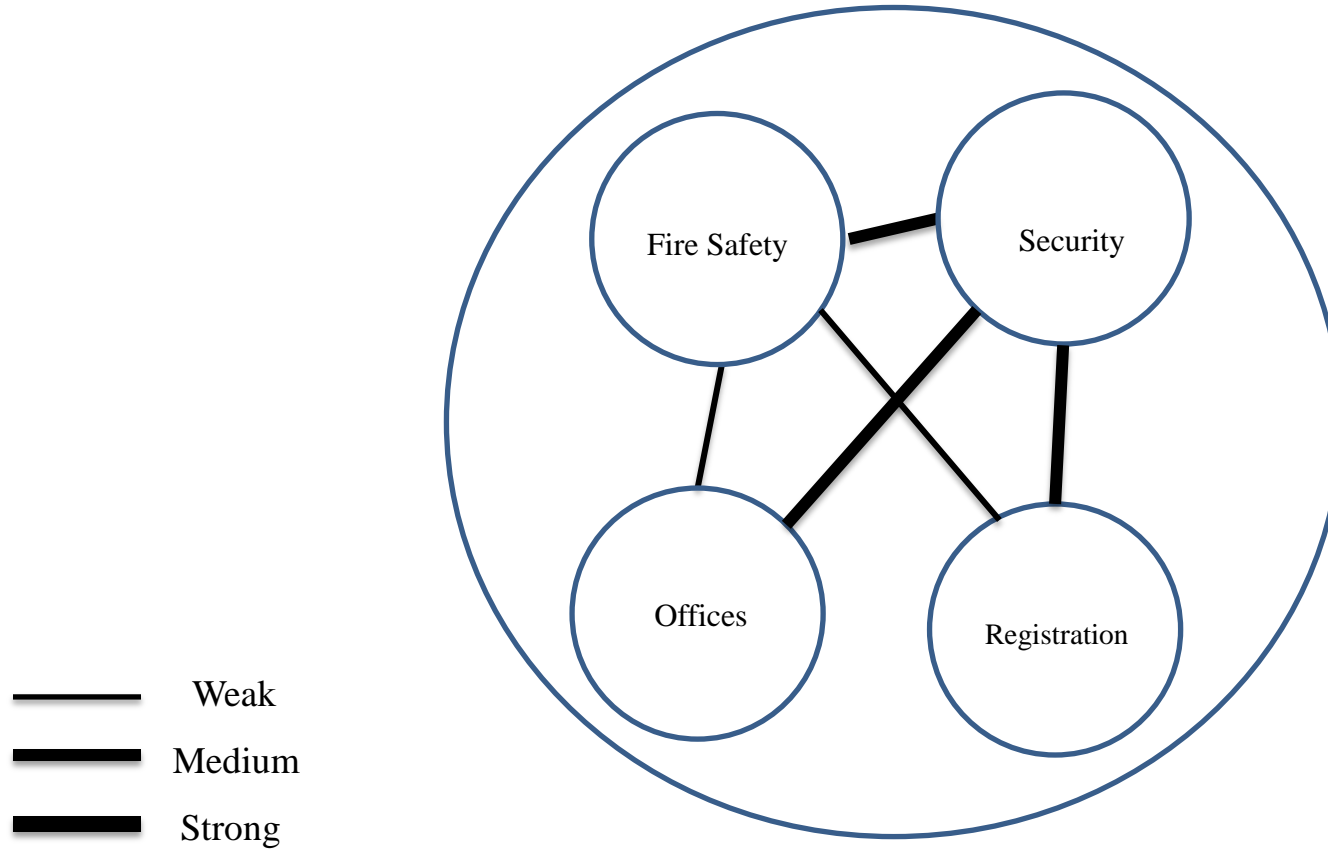
Bubble diagram inside of (Facilities)

Facilities

Figure 4-11

Health Center

Market

School

Mosque

Motivation Center

Distribution Center

Feeding Center

Weak

Medium

Strong
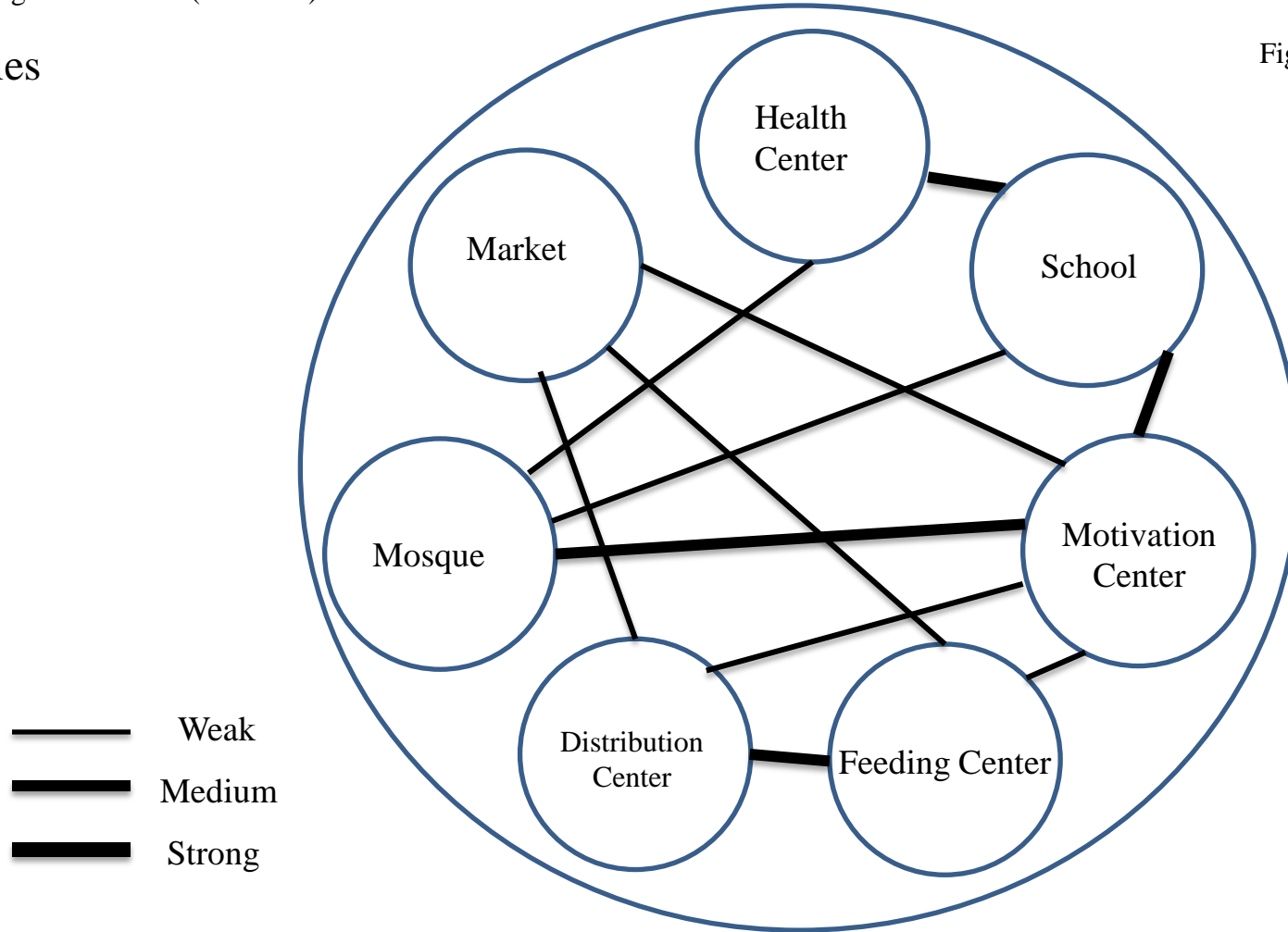
4.4.4 bubble Diagram :

The project has three main part (Units, Facility and Administration)

Figure 4-12

Weak
Medium
Strong
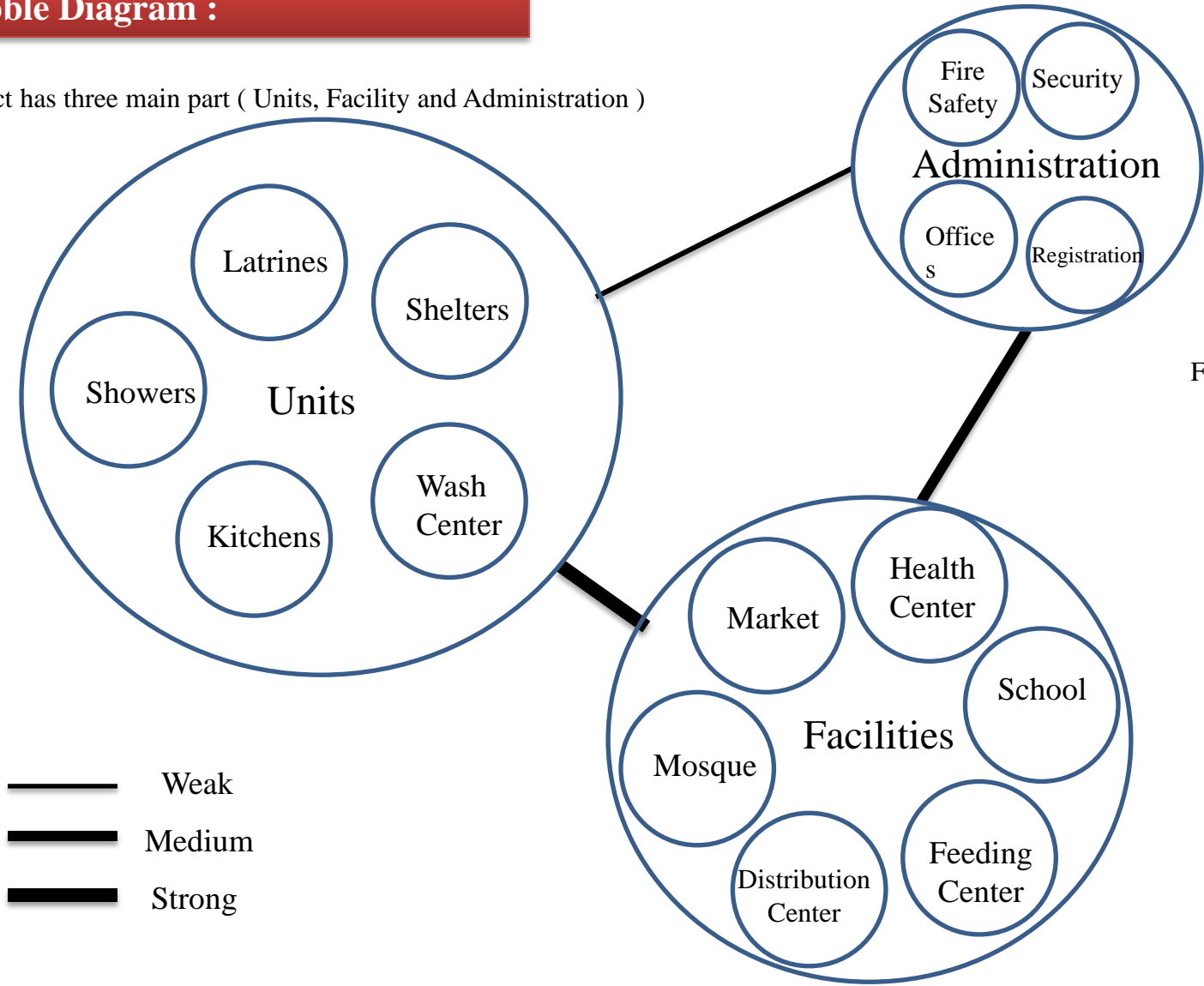
4.5 Zonings :

The project has three main part (Units, Facility and Administration)

Units

Shelters

Latrines

Showers

Kitchens

Wash Center

Administration

Registration

Security

Offices

Fire Safety

Figure 4-13

Facilities

Health Center

Mosque

School

Market

Distribution Center

Feeding Center

Motivation Center

Recreation
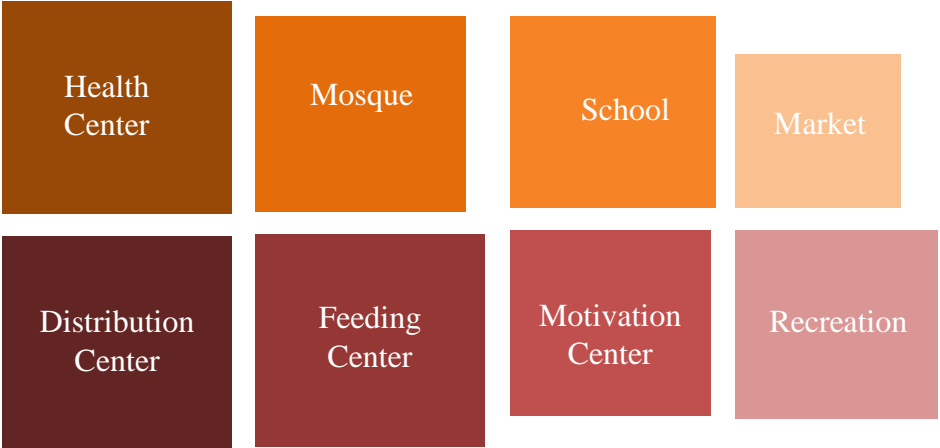
CHAPTER 5

Space Program

5.1 Introduction:

In this chapter highlight to Iraqi standard regarding
housing neighborhoods and all issues related and
UNHCR emergency standard explain data's which
used in this project.

5.2 Iraq Standard:

This thesis which taking a neighborhood and which
use the iraq standard because this project in Iraq.

According to Iraq standard:
Determinant:
-Communities:
To be defined the incomings standards in Paul Service study for planning the General
housing in Iraq, The three elements for housing groups considered as the following:
: :Neighborhood
i. Household Average (6 person).
ii. Dwelling Average (2400-3600 inhabitances)
iii. Number of dwellings (400-600 dwellings .)
*-Community social infrastructure
a-Primary school 18 classroom no .1
b-Intermediate/Secondary school 9-12 classrooms no .2
c-Local Market
d-Mosque (church)
e-Health-care center
f-Administration building
g-Nursery/Kindergarten (with job opportunities for woman)

5.3 UNHCR Emergency Standard:

According to UNHCR Emergency Standard:

Figure 5-1

Indicator: Average camparea per person (Sqm)			
Howshould this indicator be measured:			
Standard: 45 sq. m	Acceptable Range: 35 sq. m	Unacceptable Range: 34 - 30 sq. m	Critical Range: 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 roads, foot paths, educational facilities, sanitation, security, firebreaks, administration, water storage, distribution points, 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.

5.3 UNHCR Emergency Standard:

According to UNHCR Emergency Standard:

Description	Minimum Standard
Covered living area	3.5 sqm. Per person minimum In cold climates and urban areas more than 3.5 sqm. may be required(4.5 sqm. to 5.5 sqm. is more appropriate) Minimum ceiling height of 2m at highest point
Camp 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.
Gradient for camp site	1 to 5 %, ideally 2 to 4%
Drainage	Appropriate drainage needs to be put in place, especially relevant in locations that experience a rainy season or flash floods.

5.3 UNHCR Emergency Standard:

According to UNHCR Emergency Standard:

Module	Structure	Approximate number
Family	1 x family	4 6 persons
Community	16 x families	80 persons
Block	16 x communities	1,250 persons
Sector	4 x blocks	5,000 persons
Settlement	4 x sectors	20,000 persons

Figure 5-3

- According to Iraq standard this thesis will use one sector which includes 4 blocks Consisting of 5000 persons.

5.3 UNHCR Emergency Standard:

According to UNHCR Emergency Standard:

Description	Standard	Further consideration
Communal latrine	1 per 20 persons - emergency phase	Separate latrine areas for men and women For long-term accommodation use one household latrine per family
Latrine distance	Not more than 50m from shelter and not closer than 6m	Latrines must be close enough to encourage their use but far enough to prevent problems with smells and pests
Shower	1 per 50 persons	Separate, well drained, shower areas for men and women
Water supply	20 litres per person per day	
Water tap stand	1 per 80 persons	1 per community
Water distance	Max. 200m from household	No dwelling should be further than a few minutes' walk from a water distribution point
Rubbish container of 100 litres	1 per 50 persons	1 per 10 families
Refuse pit – 2mx5mx2m	1 per 500 persons	1 per 100 families

Figure 5-4

5.3 UNHCR Emergency Standard:

According to UNHCR Emergency Standard:

Figure 5-5

Health centre	1 per 20,000 persons	1 per settlement Include water and sanitation facilities
Referral hospital	1 per 200,000 persons	1 per 10 settlements
School	1 per 5,000 persons	1 per sector 3 classrooms, 50 Sqm.
Distribution centre	1 per 5,000 persons	1 per sector
Market place	1 per 20,000 persons	1 per settlement
Feeding centre	1 per 20,000 persons	1 per settlement
Storage area	15 to 20 Sqm. per 100 persons	Refugee storage
Lighting	As appropriate	Consider priority locations such as latrine, wash areas, public service areas
Registration area	As appropriate	May include arrivals area, medical clearance, distribution, parking
Administration / office	As appropriate	
Security post	As appropriate	
Security fencing	Depending on the circumstances	

Ratio of Men & Women and Children:

Number of Persons = 5000 persons
Minimum Area of per person = 45 msq (Household and facilities)
Area of site = 5000 x 45 = 225,000 msq
It mean this project need 225,000 msq for site

Number of men = 833 persons
Number of women = 833 persons
Number of Children's = 3334 persons

Ratio Of Men & women and Children

■ Men   ■ Women   ■ Childrens

16%

16%

68%
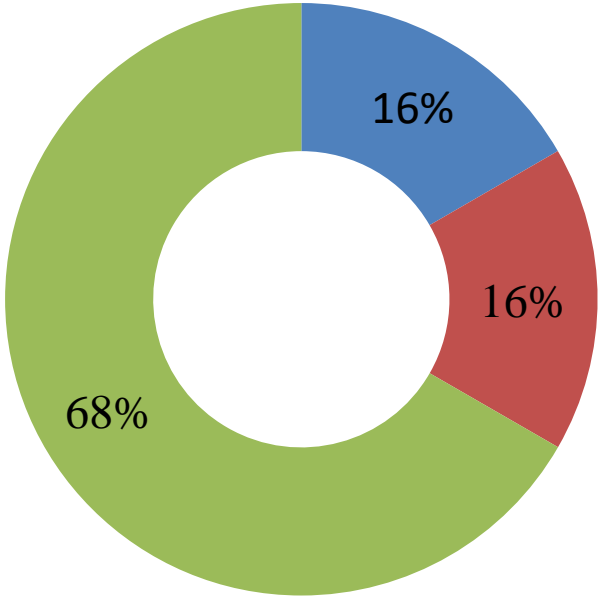
Chart 5-1

5.4 Space Program:

Table 1 (Shelter Units)

No.	Type of Shelter	Number of user	Area Per Person (m2)	Total Area m2	Net Total Area	Reference
1.	Shelter Unit 1	4	3.5	14	104	Standard
2.	Shelter Unit 2	5	3.5	17.5	112	Standard
3.	Shelter Unit 3	6	3.5	21	121	Standard

- Number of user X Area Per Person = Total Area

- Number of persons / Iraqi standard household
  5000 / 6 = 833.3 = 833 families
  833 x 21 = 17,493 msq just shelters area
  According to UNHCR : use 2 times the height of the structure as an
  appropriate distance for fire safety.
- Height of each shelter 3.0m so we need 3.0m each side of shelter
  shelter dimension, width = 5 , length = 5 ,
  Total width =3.0+5+3.0= 11m ,
  Total length = 3.0+5+3.0 = 11m
  Total net area of each house = 11 x 11 = 121 msq net area per shelter
- Number of shelter X net area per shelter = 833 x 121 = 83,300 = **100,793 msq**

5.4 Space Program:

Table 2 (service of shelters)

No.	Description	Standard	Population	Number	No. of User	Area of per component msq	Total Area m2	Net Total Area msq	Reference
1.	Latrine	1 per 20 persons	5000	250/5 = 50	20	1 latrine = 1.7 5 latrines = 8.4	420	6060	Standard
2.	Shower	1 per 50 persons	5000	100/5 = 20	50	1 shower = 1.7 5 showers=8.4	168	2424	Standard
3.	Kitchen	1 Stove per 4 families	5000	210/5 = 42	4	1 Stove = 1.08 5 stoves = 5.4	227	4528	Standard
4.	Wash Center	-	5000	210/5 = 42	4	1 space = 1.08 5 space = 5.4	227	4528	Standard & similar
5.	Water Tap Stand	1 per 80 persons	5000	63	80	0.04	3	-	Standard
6.	Rubbish container 100 liter	1 per 50 persons	5000	100	50	0.25	25	-	Standard
7.	Refuse Pit	1 per 500 persons	5000	10	500	10	100	-	Standard
			Total Area (msq)					17,668	

Latrine and Shower = 0.8 x 2.1 = 1.7 msq for 1 latrine but for 5 latrines 5 x 0.8 x 2.1 = 8.4 msq = 8.4 x 50 = 420 msq
With fire safety = if height of latrine = 2 so width 4 + 2.1 + 4 = 10.1 and length = 4 + 4 + 4 = 12 so 12 x 10.1 = 121.2 = 121.2 x 50 = 6,060
Kitchen & Wash center = 0.6 x 1.8 = 1.08msq for 1 stove or washer space but for 5 stove 5 x 0.6 x 1.8 = 5.4 msq
With fire safety = If height of kitchen and wash center = 2m so width 4 + 1.8 + 4 = 9.8 and length = 4 + 3 + 4 = 11 = 107.8 = 107.8 x 42 = 4528 msq

5.4 Space Program:

Table 3 (Area of Facilities)

No.	Description	Standard	Population	Number	No. of User	Area of each component msq	Total Area m2	Net Total Area msq	Reference
1.	Fire Safety	1 in 300m	5000	9	-	0.16	2	-	Standard
2.	Health Center	1 per 5000 persons	5000	1	100	5	500	1200	Standard & Similar
3.	School	1 per 5000 persons	5000	1	-	3 classroom = 50 msq	1500	2600	Standard
4.	Distribution Center	1 per 5000 persons	5000	1	-	-	-	1600	Standard & Similar
5.	Market Place	1 per 20000 persons	5000	30	-	6	180	1080	Standard & Similar

Health Center
Area of per person in health center = 5
Number of user per day = 100
Number of user X Area per person = 100 x 5 = 500 msq
If 25 x 20 = 500
Height of health center = 3m So Each side must be 6m for fire safety
So 37 x 32 = 1,184 = 1200 msq

School
Number of class / 3
47 / 3 = 15.7 = 15.7 x 50 = 785 msq
Number of teacher x Area per persons =
107 x 2 = 214 msq
Outdoor activity area X Number of students
1904/2 = 952 student in each time of school hours
952 x 0.4 = 380.8 = 400 msq
W.C = 8 x 0.64 = 5 msq
Total = 785 + 214 + 400 + 5 = 1404 msq = 1500 msq
If 50 x 30 = 1500 msq
Height of school = 3m So Each side must be 6m for fire safety
So 62 x 42 = 2604 = 2600 msq

▪ Facilities should comply with building standards and approval procedures. (1)

5.4 Space Program:

Table 4 (Area of Facilities)

No.	Description	Standard	Population	Number	No. of User	Area of each component msq	Total Area m2	Net Total Area msq	Reference
6.	Feeding Center	1 per 20000 persons	5000	1	-	-	-	1000	Standard & Similar
7.	Storage Area	20msq per 100 persons	5000	1	50	20	1000	2000	Standard
8.	Registration	As appropriate	5000	1	-	-	-	1500	Similar
9.	Administration	As appropriate	5000	1	-	-	-	1500	Similar
10.	Security	As appropriate	5000	1	-	-	-	1500	Similar
11.	Mosque	-	5000	1	-	-	-	1000	Similar
12.	Motivation Center	-	5000	1	-	-	-	400	Similar
	Total Area (msq)							15,380	

- Facilities should comply with building standards and approval procedures. (1)

5.4 Space Program:

Table 6 (Land use)

No.	Description	Total Area (msq)
1	Housing Area	100,793
2	Opens space Area	As appropriate
3	Circulation Area	As appropriate
4	Service Facilities	15,380
	Total	225,000

Number of Persons = 5000 persons
Area of per person = 45 msq (Household and facilities)
Area of site = 5000 x 45 = 225,000 msq
It mean this project need 225,000 msq fo site

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