

Rebuilding In Post-War Syria

A communal Campus For Internally Displaced Women Households



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Thesis submitted to the faculty of the Virginia Polytechnic Institute and State University
in partial fulfillment of the requirements for the degree of

Master of Architecture
in
Architecture

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May 15, 2019
Alexandria, Virginia

Keywords:

post-war architecture / rebuilding / housing / campus / community / displacement

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Abstract

History many times over has shown when war and internal conflicts erupt, communities are forced to flee their homes and leave behind all they cherished until, if ever possible, the time and conditions re-align to return. In such conflict zones with countless uprooted communities news of refugees often gets more coverage in the media. Yet, alongside them are Internally Displaced People (IDP) seeking as much help if not more, and not to mention can be significantly larger in number. Research also shows the majority of these groups end up being women and children exacerbating the problem and adding to the urgency. None the less, such post-conflict zones with widespread need seldom receive sufficient support for resettlement, from basic shelter and food to achieving a resemblance of some self-sufficiency.

Shelter in post-war zones is a critical issue. But, due to challenging conditions on the ground such as shortage of resources, organizations participating in rebuilding and settlement effort often resort to temporary and transitional models. Unfortunately, such displaced populations end up living in these potentially deteriorating settlements for many years with their lives at a standstill, while support and resources dwindle. The subject of creating shelter being of architecture, a question then follows how can architecture alleviate the problem of resettling displaced populations in post-war zones? And in the process how can it help communities restore some of what they lost and help renew their future? And is there perhaps a practical approach for resettlement that spurs a positive change towards what would be a long process of rebuilding communities to a nation as a whole?

Given the issue of post-war resettlement being complicated and requiring of many hands, this thesis strives to propose a resettlement model from an architectural standpoint. As a case in point, the thesis is a response to the extensively damaged city of Raqqa in Syria, following the ongoing civil war of more than 7 years. The thesis furthermore aims to propose a model that can serve as a catalyst towards much-needed rebuilding in this historic city and beyond. Besides this, the thesis makes an effort to identify and translate what post-war resettlement specific to the area in question could mean and design a communal campus at the end of which. Also, contrary to a temporary relief typology, the thesis attempts to break down and respond to some of the contextual issues present through targeted questions of why what and how towards a potentially evolving and flourishing housing and community rebuilding campus.

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General Audience Abstract

In the aftermath of conflicts and war, communities are forced to abandon their homes along with all they cherished into the worst of circumstances that leave them in limbo for many years. A majority of these displaced populations become Internally Displaced People (IDP) while others become refugees in near and far lands. Adding to that, women and children make up nearly 80% of these groups. Yet, during and post-conflict, the support for resettlement continues to be a no match to the extensive need created from basic housing to reaching a level of self-sufficiency as communities rebuild their lives piece by piece.

While issues surrounding post-war resettlement are intricate and need all resources possible, this thesis identifies and puts forward a proposal towards architectural responses. Particularly looking at one of the extensively bombed city of Raqqa in Syria, the thesis furthermore suggests a model that can be a catalyst towards the extensive need for rebuilding communities against the predicament that continue to cloud the hopes of the nation and its people. Besides this, the thesis brings forth solutions potentially suitable for a post-war campus taking into consideration material resources to human factors like labor. The thesis, unlike temporary and transitional shelters that could leave behind settlements into a slum-like state, proposes a permanent rebuilding model to help lay a foundation to what is urgently needed and will be a long term undertaking.

Dedication

To my wife Hermon who has been my rock through these few years and did pursue more graduate education right alongside me, and never failing to fill our home with love and joy making this journey even the more sweeter.

To my parents who have left their home country and sacrificed much for the sake of all their children and have never failed to encourage us towards the pursuit of knowledge and wisdom.

To my siblings who have continually helped myself and my wife through this process in many ways than one, and my friends who never shied away from giving me a listen and encouragements along with thoughtful words.

And,

To all the Syrian women, children and families who have lost so much and continue to suffer while the world continues to watch their anguish as they await a resemblance of normalcy and a better future; and the countless populations across the globe who continue to suffer by man-made and natural disasters and are in need of support with each day; may the service of architecture finds its way to you!

Acknowledgments

Thank you Susan Piedmont-Paladino for being an exceptional mentor during my time at the WAAC and while pursuing my thesis, for steering me in the right course to reach clarity in my thesis, for helping me define the relevant architectural questions and guiding me throughout the entire quest in what was a daunting topic to absorb and respond to.

Thank you Paul Emmons for helping me hone and better marry the theoretical and practical approaches of my thesis with your unmatched listening and encouragements as well bouncing subtle but core ideas with me and aiding me to better evolve the content of my thesis.

Thank you Paul Kelsch for all your resonating advise like working with the unloved site, which has been the backbone of this thesis and for always sharing your personal experiences and for challenging me to dig even deeper as I investigated and developed my thesis.

Thank you Ezgi Esbillen for your support even before the beginning of the thesis, for rallying alongside my advisory committee, going above and beyond to help me get the most out of this process and for all your council that shed some light on a context that I was less familiar of as well connecting and directing me to valuable resources.

Thank you Karima Benbih for giving me your time during your travels and visit and reaching out to help me better navigate my topic with your unparalleled practical experience which has been an enlightening and critical piece of my thesis.

Thank you, Ziad Demian, first for your wise counsel and for challenging me more in developing my program and the how-to of my proposal helping me synthesize a significant part of my approach. Thank you also for reminding myself and peers that the pure reward in the profession of architecture is one which holds the sense of service at its core.

And to many of my fellow WAAC students and other faculty who have bestowed their valuable time, counsel and continued encouragements, know you are truly appreciated.

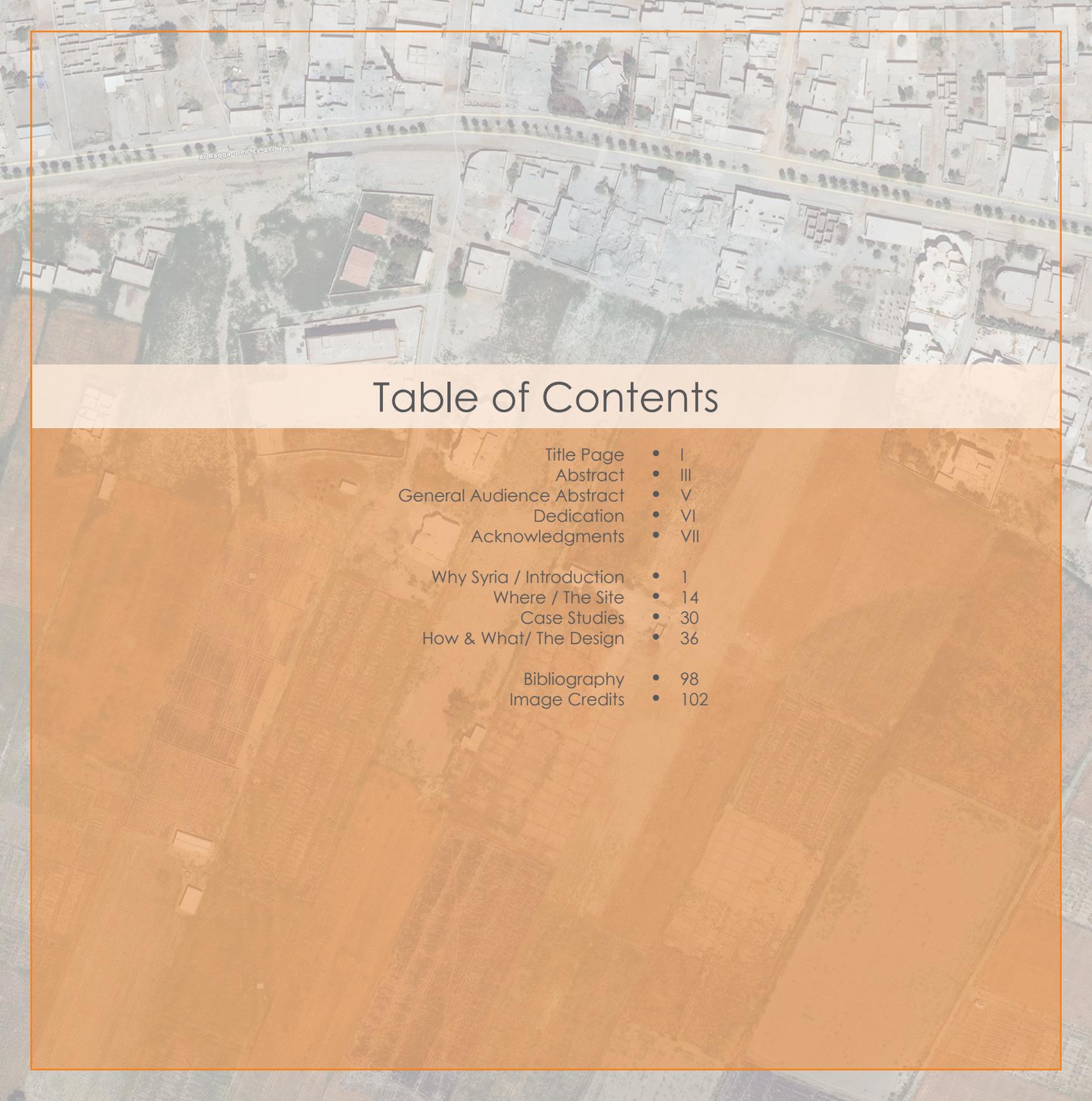


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why syria?

why syria?

Introduction

Many nations across the globe every day are affected by manmade and natural disasters. During which the basic need of shelter is compromised leaving many vulnerable to much harm. I began my research particularly into conflict-related displacements having been confronted with the reality architectural services are the least present and afforded by communities with much need of it. According to Architecture for Humanity, in their book "Design Like you Give a Damn" when published in 2006, refugee camps and slums had nearly one in seven of the world's population, while also half the world's population lacked access to clean water and sanitation resources.

Earlier in 2017, I had also come across some shocking images of destroyed cities across Syria due to the ongoing civil war. Among which was the city of Ar-Raqqa/Raqqa besieged to debris and ashes as it turned nearly into a desolate island of ghosts. Conditions in other Syrian cities like Ghouta were also so alarming that a CNN article called it "Hell on Earth". This was one of the most devastating period in our history since World War II. History was repeating itself once again as the war turned upside down the lives of many as it stripped them off all they had known, loved, and owned along with hopes of a better future in what was their home for generations.

While grappling with this fact, as an individual and an architecture student who has chosen the path of creating and building for a vocation, my thesis required of me to understand what lays behind the forces that spark destructions of grand scales by manmade causes. With that premise, I then have begun a journey through this thesis, to ask the fitting architectural questions which could lead me to some practical lessons and perhaps towards sorting a rebuilding model for war or conflict-stricken communities and beyond.

The road to understanding my topic of a place I have never visited, nor have known much about aside from what was being covered in the mainstream media was a challenge in it of itself. It was also difficult to watch the kind of harm conflict has brought about over many by the hands of few. I do not believe one can truly understand the level of pain being felt from such distance. Yet, destruction and rebuilding has been part of the history of the human race. And due to the extent of need present across our globe, it is clear we can no longer afford to be bystanders of this widespread issue which will come to affect us one way or another. As such, this architecture thesis is an exploration of a potential rebuilding model to an extent possible, not as a formal conclusion to be forced upon but rather as one of the myriads of ways rebuilding translates to and can be incorporated into the conversation surrounding the topic.

According to the UNHCR at the end of 2017, nearly 71.44 million people around the globe were considered persons of concerns due to mostly ongoing conflicts. Post World War II, recent years have been the highest on record of conflict-related crises. The statistics also highlights, Internally Displaced People referred in short as IDP, made up over half of the concern populations followed by refugees and returnees.

By the end of 2017, among the countries with the most displaced population, Syria stood near at the top of the chart due to the years of civil war that has ravaged the nation since middle of 2011.

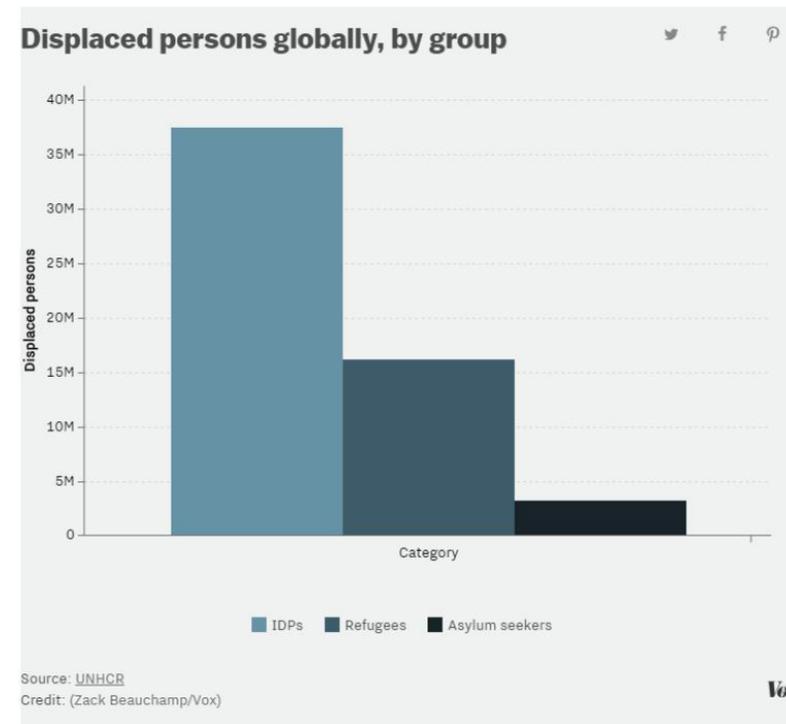


Fig. 1 UNHCR Statistics World Map



Fig. 3 Displaced communities awaiting UN aid south of Damascus, Syria in 2014



Fig. 4 Syrian families nearing the Turkish Border as conflicts escalate

Before the conflict, Syria had a population of nearly 22 million. And after the conflict, almost a third of the country's population have become internally displaced with the majority being women and children. And many also have fled to the neighboring countries of Turkey, Iraq, Lebanon and others overwhelming some of them beyond their ability to support such a massive human displacement crisis.

UNHCR STATISTICS
The World in Numbers

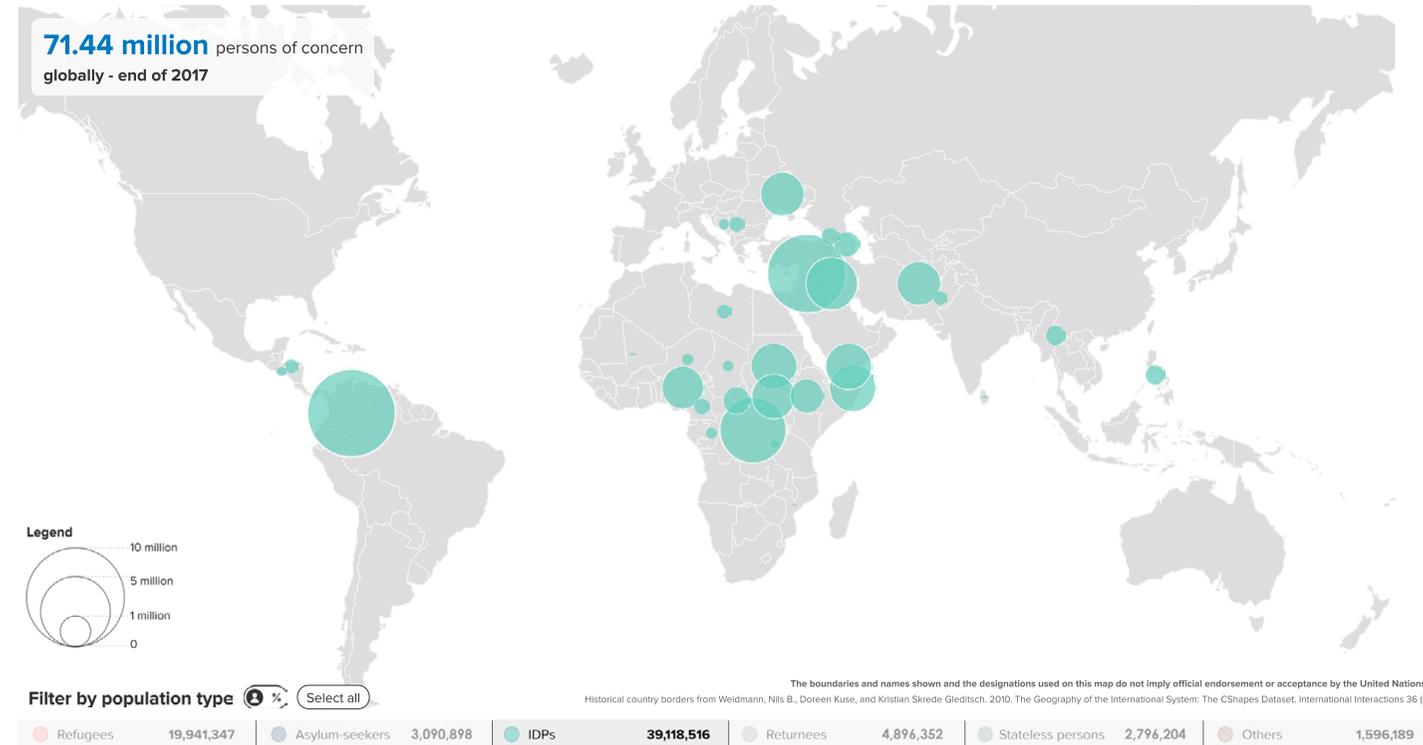


Fig. 2 UNHCR Statistics World Map



Fig. 5 UNHCR Statistics World Map - Syria

As the civil war escalated in Syria, millions of IDPs across the nation continually fled between near and far away cities, as well within their home towns without certainties they will be met with better conditions with abundant support or resources.

On the other hand, the many thousands who managed to reach the border and cross it, often having survived or lost their loved ones during the treacherous journey made on foot, end up in refugee camps that have become over-crowded over the years.

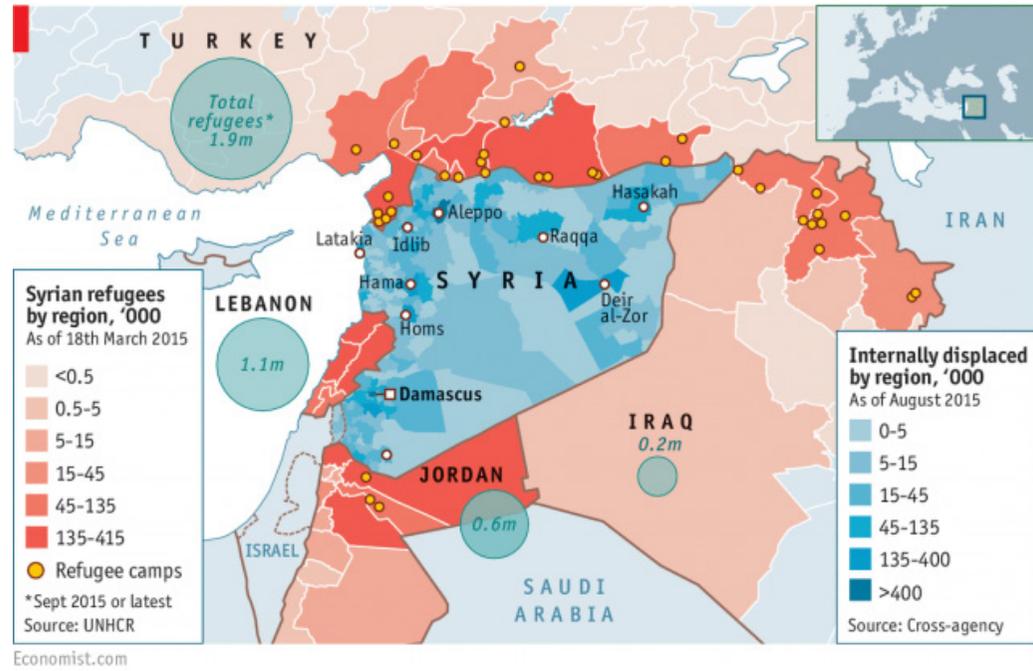


Fig. 6 Regional map of Syrian IDPs and Refugees inside Syria and neighboring nations by 2015

Economist.com

As it has often been the case, in times of conflict women and children makeup as much as 80% of the displaced populations. With an average of 3-5 children per household in Syria, during the civil war women alone have had to bear the burden of carrying for their families without having a source of income and relying on outside support which scarcely showed for lack of safety on the ground among others.



Fig. 8 A displaced woman and her children in a makeshift home in Baba Amr, Homs

“Women heads of household struggle to support and protect family, in crisis-torn Syrian Arab Republic”.

Iman Morooka, UNICEF

IDPs Arrival Location Map

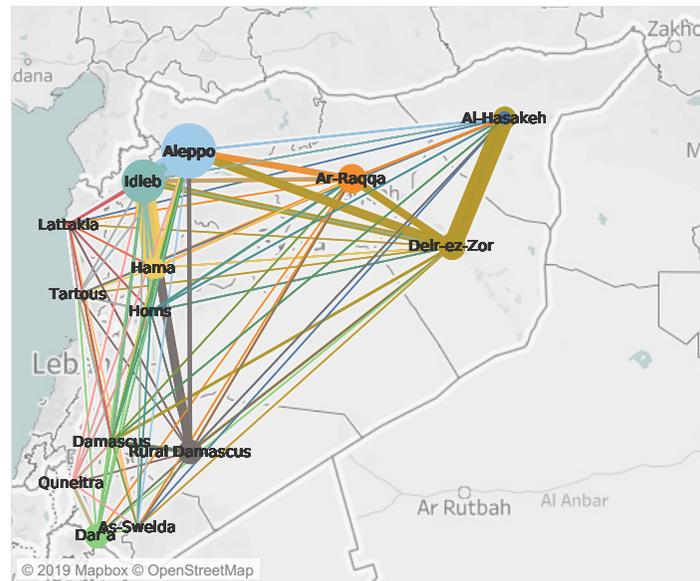


Fig. 7 Syria IDPs Arrival Map and Flow Chart between Jan. 2016 to Jan. 2019

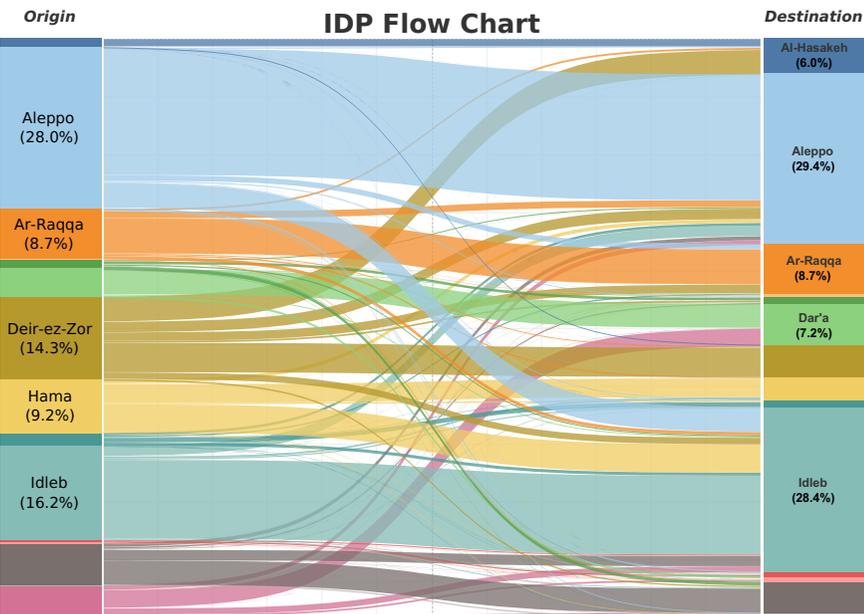


Fig. 9 Displaced persons camp Atmeh, Syria on Jan. 2013(Joel Carillet)



Fig. 10 A displaced woman and her children in Raqqah.

Fig. 11 Living conditions in a typical tent shelter are far from ideal. The heat during the day and the cold at night make life in tent camps unbearable.



A Syrian refugee girl holds her younger sister while her mother, right, washes clothes inside their tent on July 22, 2015. Muhammed Muheisen-AP

Fig. 12 The displaced also endure the loss of loved ones adding to their misery. While many trek over long distances they often have to do without the basic needs of food, water, and shelter where children and women are the first to become victims.



Syrian refugee Mohammed Askar, 39, touches the grave of his daughter Jawahir, 1, who died last February after suffering from chronic malnutrition, while he and his wife Hasnah 37, and his daughter Hannan, 12, and son Wael, 4, visit her grave on July 23, 2015. Muhammed Muheisen-AP

Fig. 13 Lacking the right support, families living in formal and informal camps as well those on the run are also highly likely to fall ill.



A Syrian refugee woman sits on the ground next to her infant suffering from a high temperature due to an infection in her throat, outside their tent on July 26, 2015. Muhammed Muheisen-AP

Fig. 14 The future of countless children, with some only knowing camps, continues to be gloomy in a country where the majority are underage children living in the worst conditions possible in all aspects as they await a better tomorrow and begin again.



Syrian refugee girl, Zubaida Faisal, 10, jumps rope while she and other children play near their tents at an unofficial tented settlement near the Syrian border on the outskirts of Mafraq, Jordan, on July 19, 2015. Muhammed Muheisen-AP

“Around 1.2 million houses in Syria have been damaged since the start of the conflict, and 400,000 of those have been completely destroyed and are uninhabitable.

IDPs take refuge in a variety of places: in ideal situations, fully operational, aid-sufficient collective shelters in schools, buildings, hospitals, or mosques. But of Syria's 6.1 million IDPs, only 1.7 million are estimated to live in these collective shelters leaving over 70% of Syrian IDPs without access to adequate shelter”.

Syrian Relief & Development

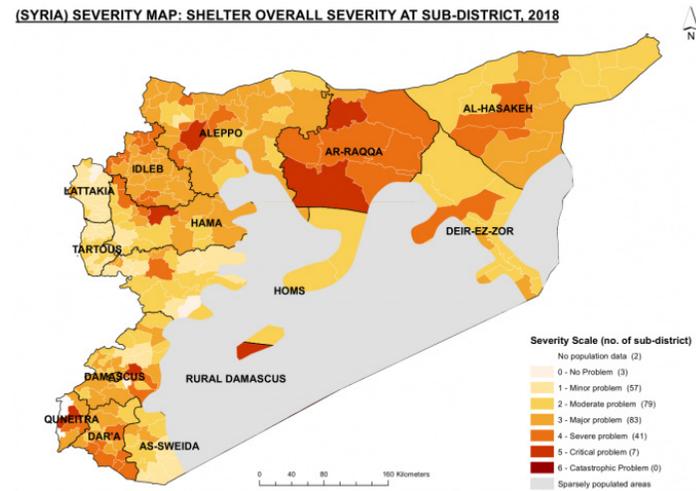


Fig.15 Syria lack of shelter severity map in 2018

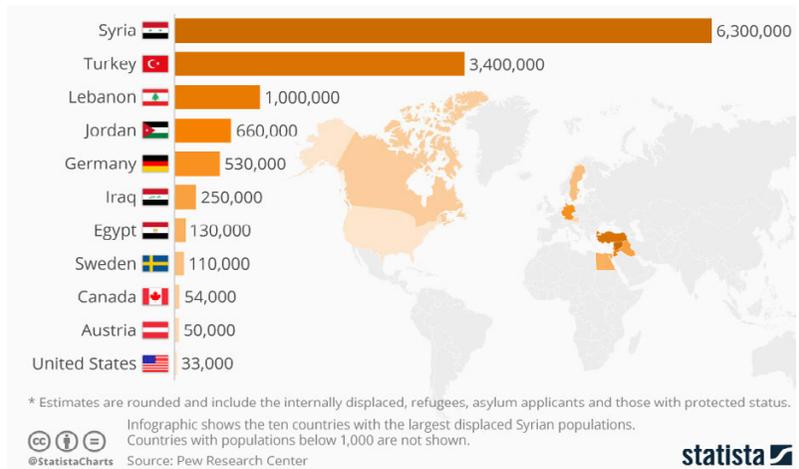


Fig. 16 Displaced Syrian populations inside Syria and refugees outside

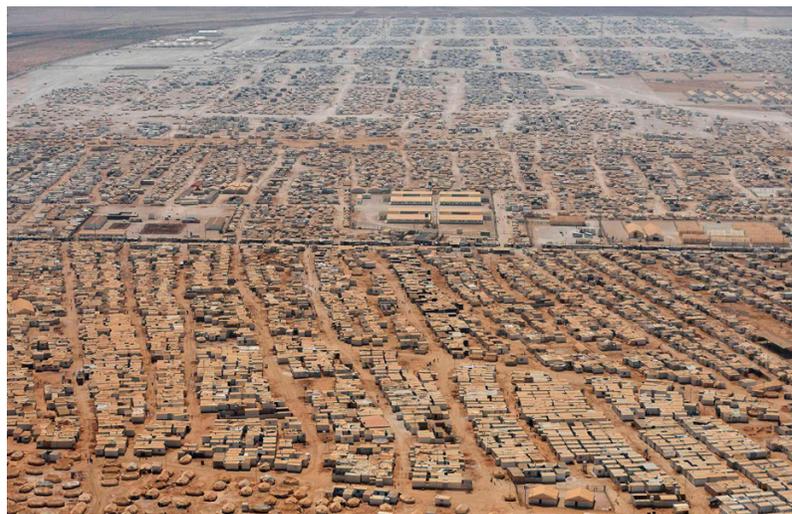


Fig. 17 Zaafarani Refugee Camp near Jordan

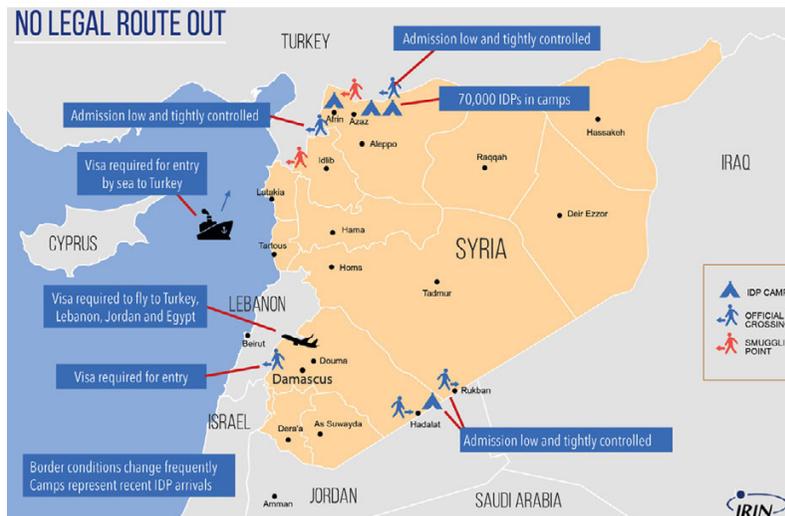


Fig. 18 Syrians seeking a way out into neighboring countries

The civil war in Syria has forced families to make a run for their lives with whatever they can carry by hand. Women and children being the majority of these groups, the burden of rebuilding will fall on them if and when they can get back home.



Fig.19 Families fleeing the face of war, having endured much loss

In areas where there has been continued fighting or serious damage, buildings like schools end up serving as a shelter for the displaced; which can also be a target themselves.



Fig. 20 Al-Rameh collective Shelter, December 2013

Those who make it into camps live with issues of crowded settlements, which in some cases has been fire, taking more lives and their remaining belongings.



Fig. 21 A refugee camp in Lebanon after a fire damage

Syria's Education Crisis

Following the near-decade of war, million's of children have also been forced to lag in their education. Those born during the war are even in much worse shape having received little to no education, which puts a question mark on the nation's future.

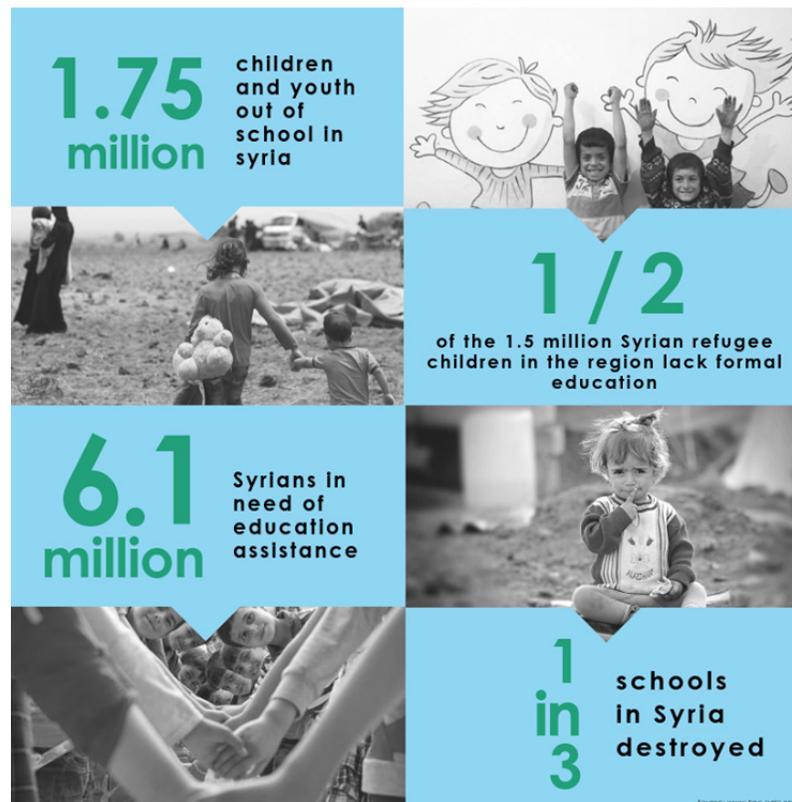


Fig. 22

The war has tormented the physical, mental, and emotional wellbeing of many across Syria. Most of all, children who are brought up during this period of civil war will need many years of help to get past the horrors which will continue to haunt them.

The Unbearable Toll of War on Syria's Children

Selected results of research into the effects of war on children in Syria

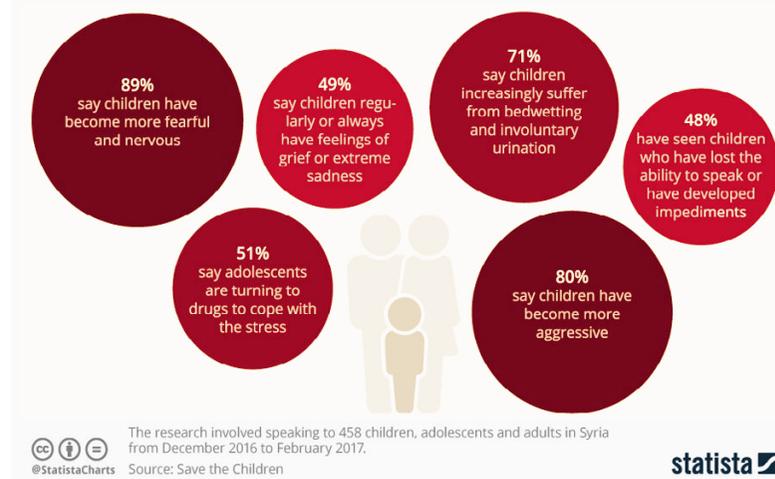


Fig. 25

With the desperate need to return to normalcy for many of the Syrian children, some are making the effort and opening schools in whatever structure is available; a barn in the case below.

Syrian children and their families continue to live among the rubble, having to make some sense of all the destruction around them.



Fig. 23 A school damaged by an air strike in Idlib (AFP/Getty)

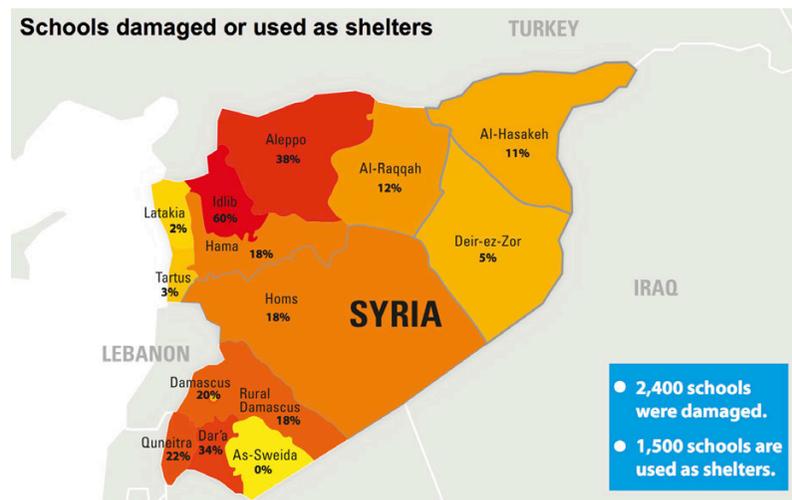


Fig. 24



Fig. 26 Displaced children attending school in an old animal barn in Dara



Fig. 27 Childhood amid the rubble

As conflict is dying down, displaced families are rushing back to see what is left of their home as they begin the long road of rebuilding. But such a period comes with the challenge of not having a source of income or the necessary level of support to help them get back on their feet and they continue to barely survive the day with hopes it will get better.



The top two floors of Eissa Ali's house were missing. Most of the neighborhood was gone, erased by airstrikes. They patched holes in the walls, cleaned out the rubble and moved back in anyway.

Fig. 28



We visited Paradise Square, which used to be a thriving commercial center.

Fig. 29

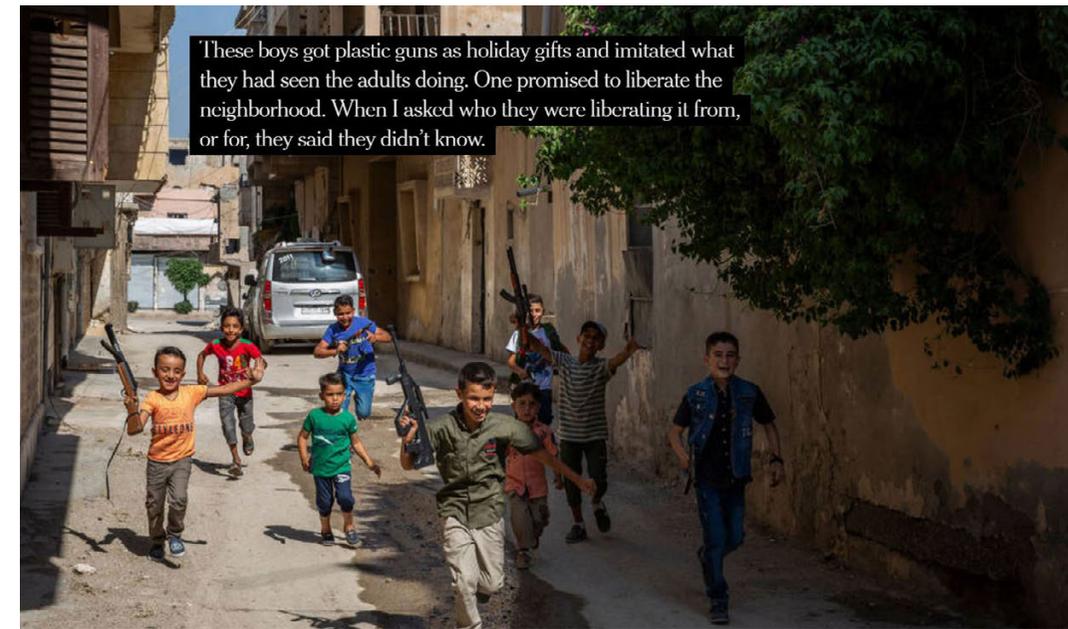
A sign of the displaced returning home is the slowly opening up markets. Although these markets may not meet the extensive demand, they lay the foundation for basic needs of food, a sense of community, and the return of peace longed for.



Many people have come back, preferring their damaged homes to refugee camps. But there is little outside aid to rebuild.

Fig. 30

Alongside the urgent needs of shelter and food, there is the issue of a generation of kids to educate, who will be asked to rebuild what has been lost. None will be as invested as the people of Syria and their children in the rebuilding of the nation, hence it is no small act to plant the seeds for self-sufficiency wherever possible.



These boys got plastic guns as holiday gifts and imitated what they had seen the adults doing. One promised to liberate the neighborhood. When I asked who they were liberating it from, or for, they said they didn't know.

Fig. 31



the site

the site

The physical destruction across the city of Raqqa at first glance may appear beyond redeemable. But as long as people continue to return to it and many do still call it home, it is of the utmost importance this stain in history is responded to. And clearly, the sheer scale of this disaster which is affecting millions needs no convincing that it must receive support from those who have contributed into its manifestation. Support must also come from nations and individuals who believe in the value of lending a hand to our fellow men, women, and children whose needs, desires and wishes are no less than our own.

Throughout the civil war, and mostly between 2017 and 2018 during ISIL control, the city of Raqqa has been besieged. And as people began to return, they have found thousands of buildings turned into rubble and most infrastructures destroyed. The image below shows the extensive damage covering the majority of the city. On the other hand, the city peripheries have endured a little less damage which could mean rebuilding efforts can begin in such areas as those returning will likely seek shelter here.

The brief statistics from Reach for March 2018 shows the timeline of events and the number of returnees in the city post-conflict. Raqqa before the war had a population of nearly 220,000. Per the number of returnees, at least half of the city was displaced. And as these communities find their way back home, they are rather finding nothing but destruction across the city. Therefore, for those who find the city to be their only home, they will have no choice but to find a way to rebuild.

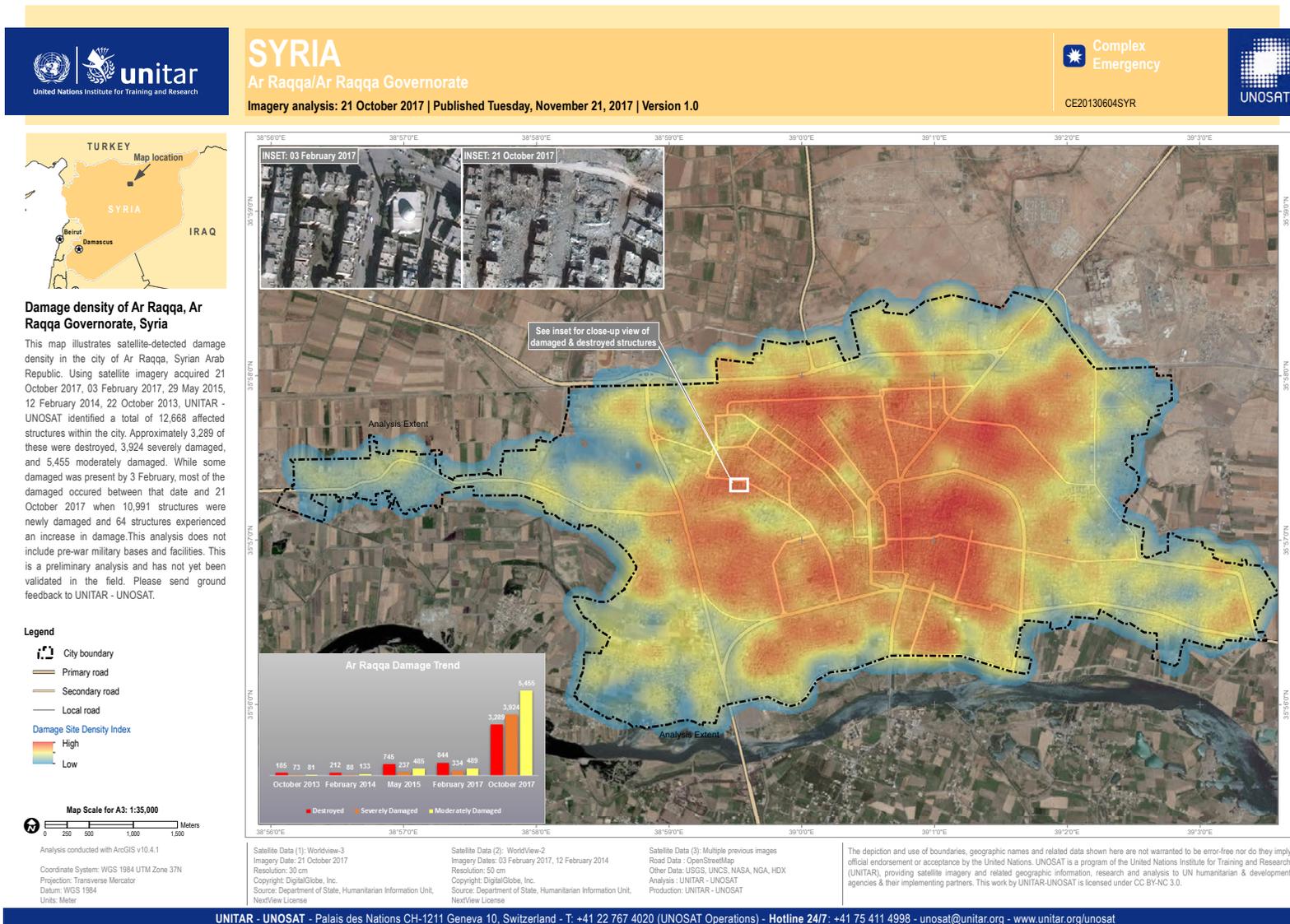


Fig. 32 Damage Density the Raqqa/ Ar Raqqa Governorate, Syria

Ar-Raqqa Governorate, March 2018 Humanitarian Situation Overview in Syria (HSOS)

REACH Informing more effective humanitarian action

KEY EVENTS

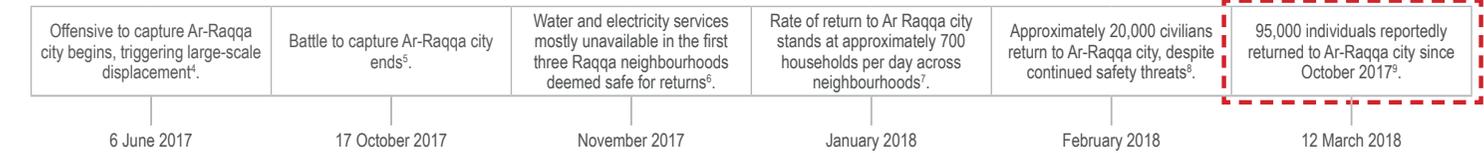


Fig. 33 Humanitarian Situation Overview

Some of the reasons why IDPs return are:

- To protect assets and properties
- Absence of income sources
- Issues of integration where they were displaced to
- Improvement in security of their home city/ town
- Difficult camp living conditions

Zooming closer into two of the periphery Raqqa neighborhoods of Ammar Ibn Yaser and Ma'amoun, it is possible to get a better idea of the level of damage. While many buildings have still been destroyed, a majority of this neighborhood is in a functional state and will likely have more density than areas near the city center. The map also highlights the locations and conditions of buildings like mosques and schools which are present but are damaged awaiting repair.

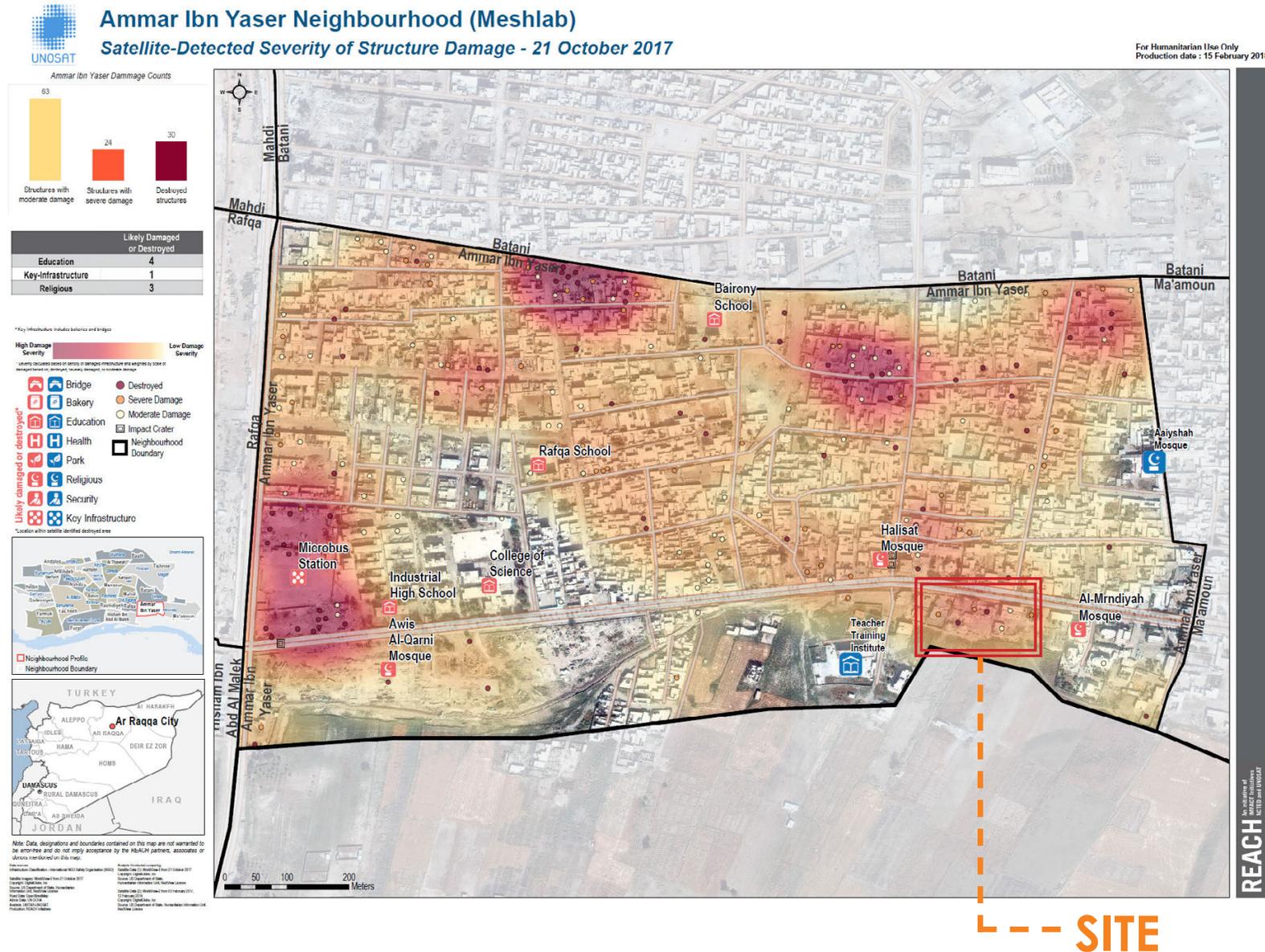


Fig. 34 Satellite Damage Assessment

Based on the state of the neighborhood and the issues raised earlier, the needs responded to in this thesis are:

- Shelter
- Education
- Multi-purpose community center
- Place of Worship
- Employment / Sources of Income

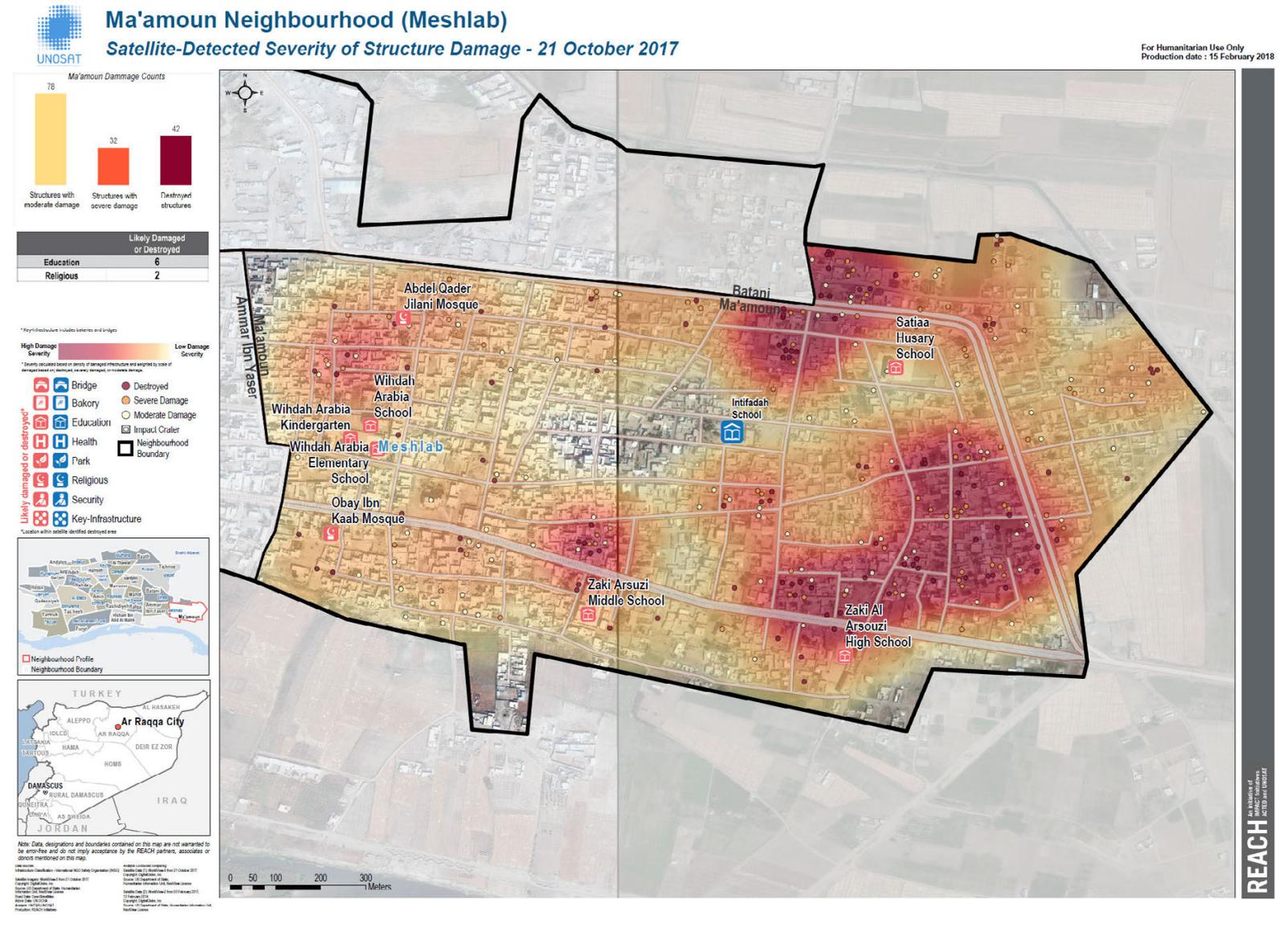


Fig. 35 Satellite Damage Assessment

When thinking about rebuilding in a city with as much damage as in Raqqa, identifying a site that speaks to the city at large is of great importance, particularly in terms of the extensive debris present.

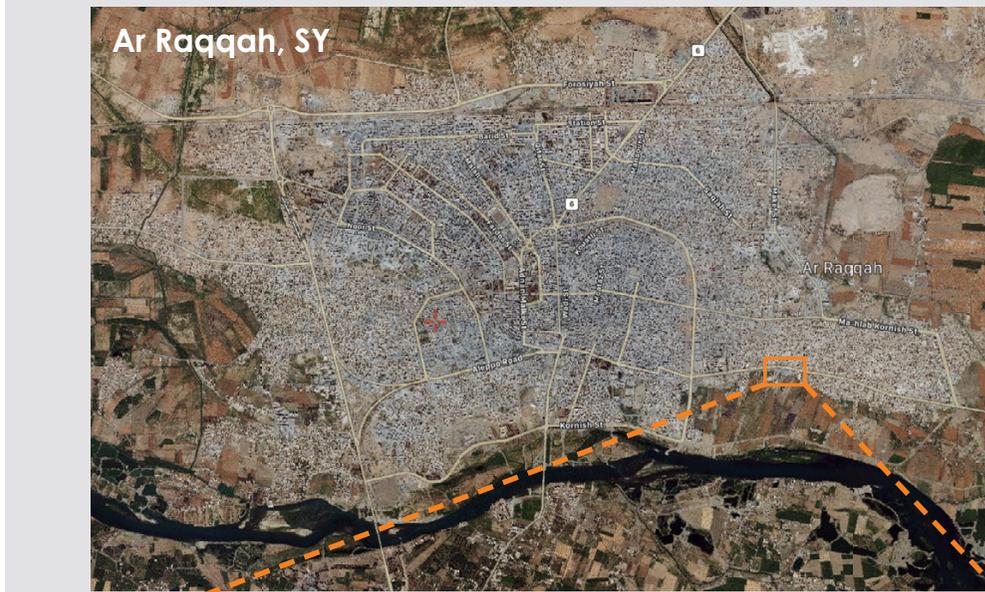


Fig. 36 Satelight Image - Feb. 2019

Factors considered in the selection of the site:

- Low level of destruction in the neighborhood
- Sits along an artery road in the city, connecting to cities like Dier-Azor to the east
- Proximity to the Euphrates river
- Adjacency to farming land
- A site with a completely damaged building, and potential for recycling concrete debris
- Access to soil as a building material
- Ability to self-sustain/ live off of public infrastructures
- Solar orientation

Some of the Issues present in the city and neighborhood:

- Extensive damage across the city with explosives yet to be uncovered
- No running water and electricity
- Lack of schools and worship centers
- Lack of community centers
- Lack of health facilities



Fig. 37 Levels of distruction in Raqqa, March 2018



Fig. 38 Raqqa during ISIS occupation in February 18, 2018

TABQAH DAM (Fig. 40)

- 15 Miles west of site
- Highest elevation 993 ft
- Lowest elevation 830 ft
- Partially operational



OLD RAQQA CITY WALL (Fig. 41)

- 0.6 Mile west of site
- 2nd century monument
- Partially damaged



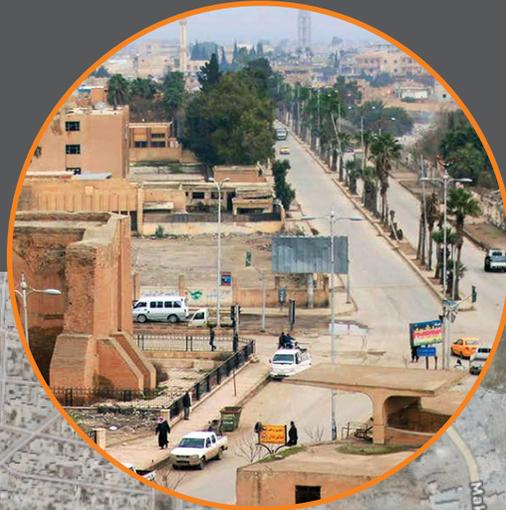
QASR AL-BANAT (Fig. 42)

- 1 Mile north-west of site
- 9th century residence



SITE NEIGHBORHOOD VIEW (Fig. 43)

- From 0.7 Mile west of site
- Low rise (1-4) stories high buildings



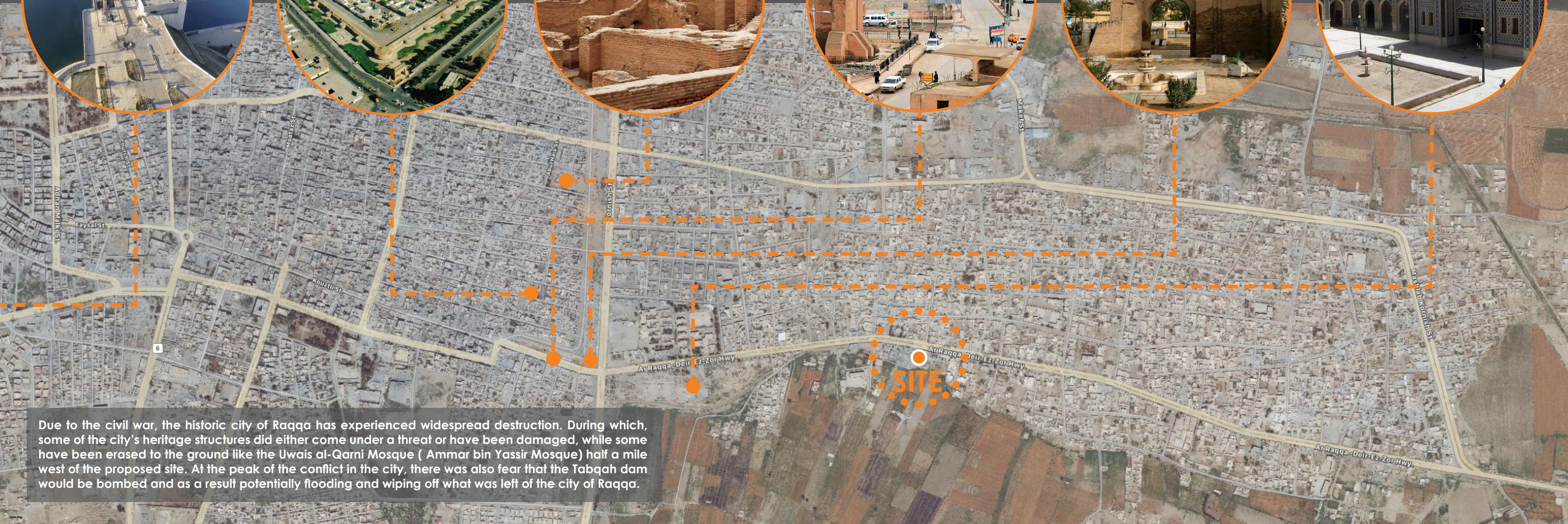
BAB BAHGDAD GATE (Fig. 44)

- 0.6 Mile west of site
- 8th century structure
- Partially damaged



UWAIIS AL-QARNI MOSQUE (Fig. 45)

- 0.5 Mile west of site
- Heritage site
- Completely erased in 2014



Due to the civil war, the historic city of Raqqa has experienced widespread destruction. During which, some of the city's heritage structures did either come under a threat or have been damaged, while some have been erased to the ground like the Uways al-Qarni Mosque (Ammar bin Yassir Mosque) half a mile west of the proposed site. At the peak of the conflict in the city, there was also fear that the Tabqah dam would be bombed and as a result potentially flooding and wiping off what was left of the city of Raqqa.

Across Syria, traditional style homes vary between the rural and urban areas. Building materials used also vary between regions, like hand-applied mud, rammed earth, stone, wood, masonry blocks, etc. (Levant, 2004)

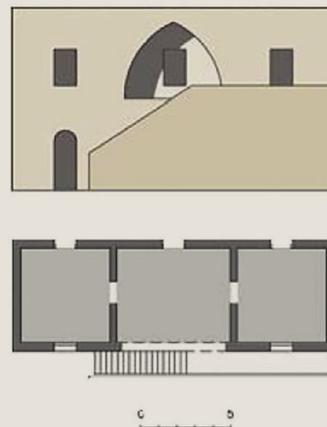
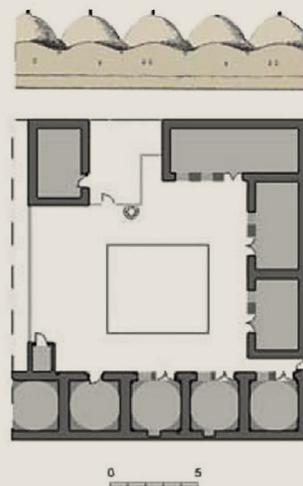


Fig. 46 A Rural House With A Courtyard

Fig. 47 A House With A Liwan/ Front Narrow Hall

However traditional styles in Syrian homes differ by location among others, they do share characters that also make them similar. Courtyards are a prime example of such characters. A rural house, for example, may have a smaller and simplified layout while an urban courtyard can be more intricate, potentially connecting with a series of courtyards that may have a garden piece sitting over a bigger lot and together with the house which creates the compound. Arches are also another common features in Syrian homes used in window and door expressions as well in porticos. (Levant, 2004)

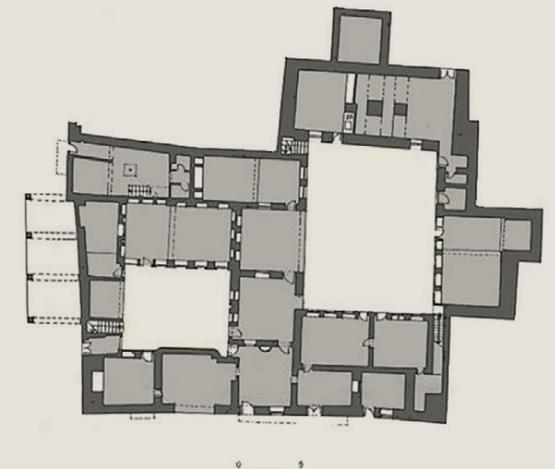
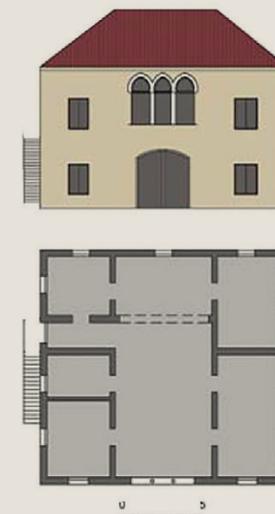
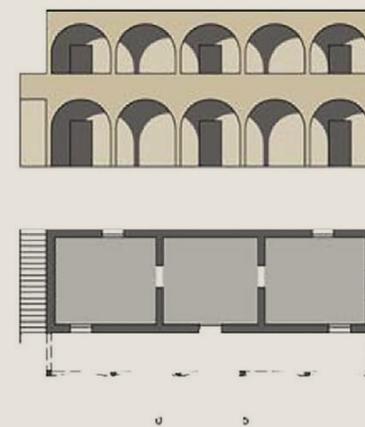


Fig. 48 A House With A Riwaq/Portico

Fig. 49 Lebanese House

Fig. 50 An Urban House With A Courtyard

Courtyards in traditional Syrian urban homes being a common feature, the images below highlight the distinct feel and character they have in their use of materials, styles, colors, patterns, textures, and application of fountains and gardens to name a few.



Fig. 51



Fig. 52



Fig. 53



Fig. 54

Among the different materials used to build homes and other building in Syria and the region, mud construction dates back many millennia. Although there are plenty examples of mud constructed buildings in both the rural and urban areas, the majority of urban buildings have moved towards concrete. Raqqa is a perfect example of that. While there are centuries-old ruins in the city that are a testament to the qualities of buildings made out of earth, building with earthen materials has not evolved or is no longer the norm. And now post the conflict, the clean up of this difficult and expensive to recycle material awaits.



Fig. 55 Modest rural earth home



Fig. 56



Fig. 57 Mud high rise / Shibam, Yemen



Fig. 58

The project site selected for the thesis sits facing north/south on its long axis. Hence, based on its geographic location in the lower northern hemisphere which has souther sun exposure throughout the year, there is an opportunity to incorporate solar water heaters and solar panels to meet everyday needs of power.

The site also has the advantage of the winds, where the strongest winds come from the west and southwest, following the steep drop in altitude of the city. Considering also the region has hot months, designing the building to allow for natural ventilation becomes beneficial.



Fig. 59 Sun-path Diagram

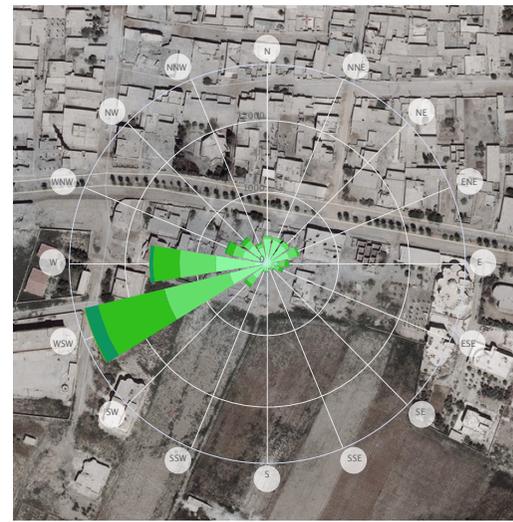


Fig. 60 Windrose Diagram

Cold winters and nights are also common for this region. And as a response it is important to identify materials that have good thermal control to minimize the need for more energy consuming heating solutions.

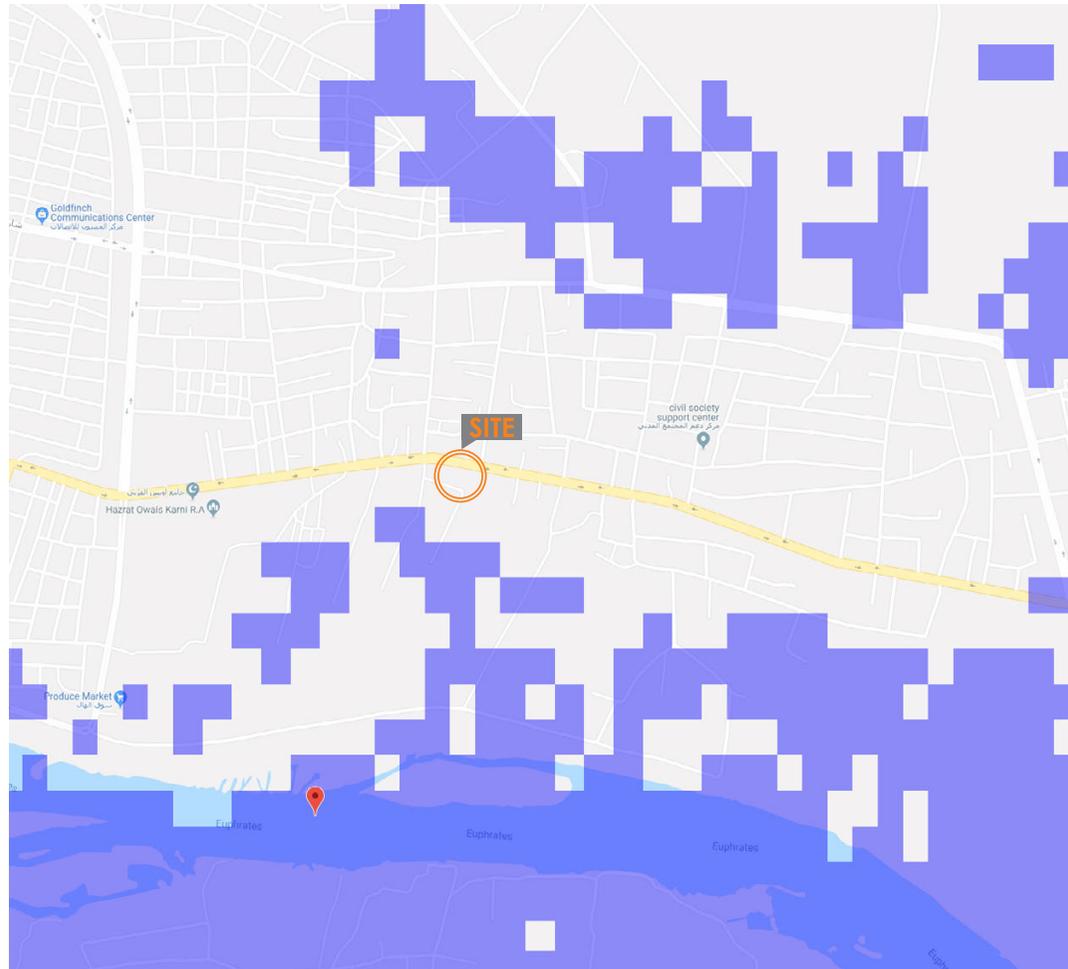


Fig. 61 Potential Flood map (16 ft / 5m rise coverage)

As a city along the valley of the Euphrates river, Raqqa is susceptible to floods. Although, the Tabqah dam west of the city, which sits roughly about 200 ft from the elevation of the city, helps manage chances of heavy flooding following heavy rainfall. The flood analysis map here shows how far inland a flood can surge if there is a rise of about 16ft in the river.

The site identified for this project at the highest elevation on its northern edges currently sits at about 30 ft from the river and drops down to about 20 ft on its southern edge.

Based on the weather condition of Raqqa some design take aways are:

- Use of well-insulated wall systems
- Designed with natural ventilation in mind
- Rainwater collection for sanitation and gardening
- Application of shading devices for summer months
- Sun reflective surfaces to lower surface heat gain
- Vegetation for cooling and shading

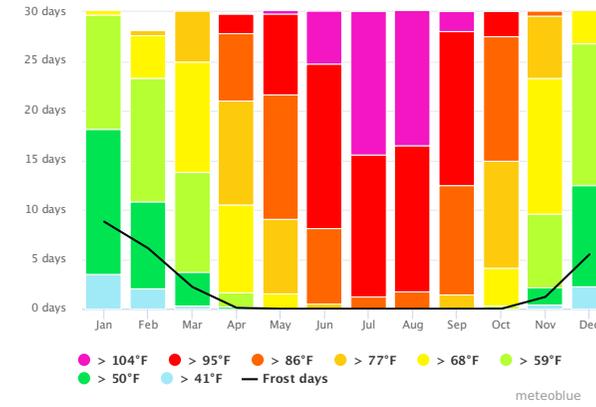


Fig. 62 Maximum Temperature

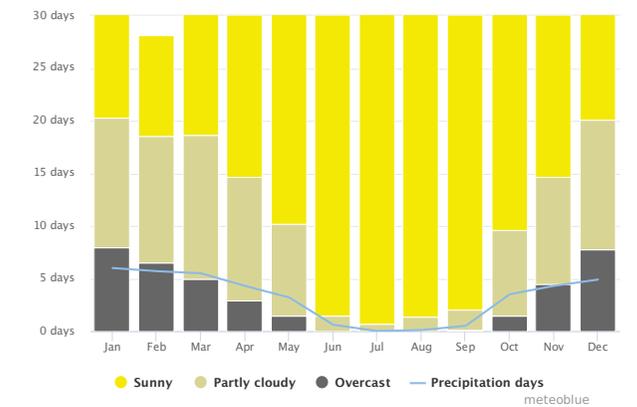


Fig. 63 Cloudy, Sunny, and Precipitation days

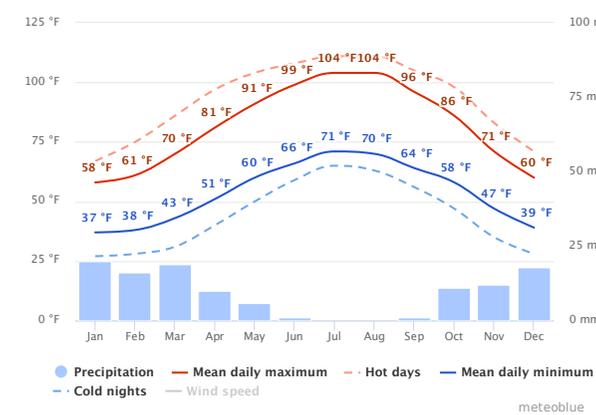


Fig. 64 Average Temperatures and Precipitation

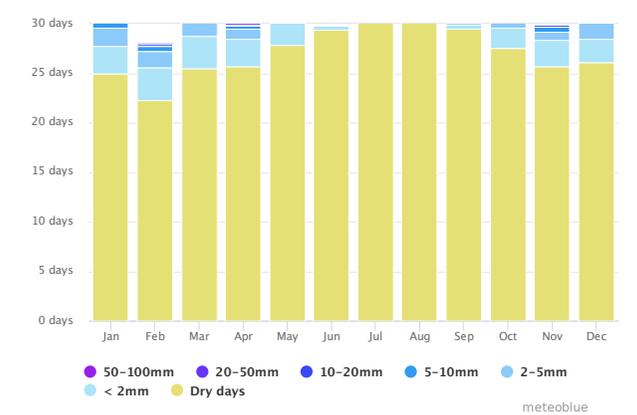


Fig. 65 Precipitation amounts

CASE STUDY 1

Quinta Monroy

Location: Sold Pedro Prado, Iquique, Tarapaca, Chile

Architect: Alejandro Aravena

Project Type: Residential / Social Housing

Project Size: 53,820 sf

Year Built: 2003

Takeaways:

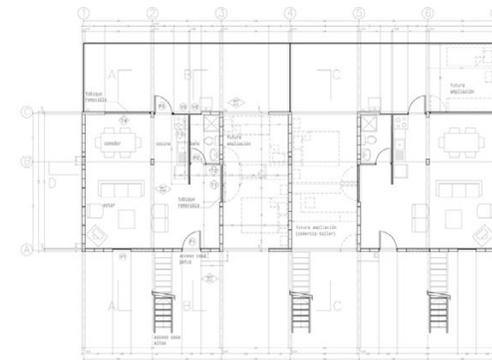
- Transitioned slums into a permanent settlement
- Helped created a functional density with open spaces
- Designed in mind of future growth
- Efficient application of funds to build complex and units
- Allowed community to participate in the making of their own home
- Identified the core components of a house to develop the program



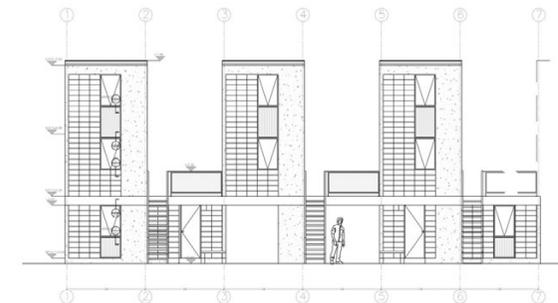
Original Development



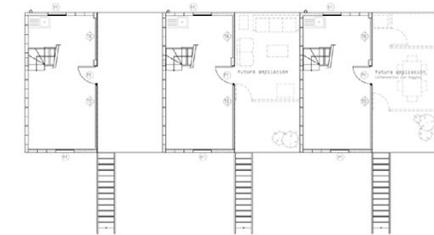
Growing Development



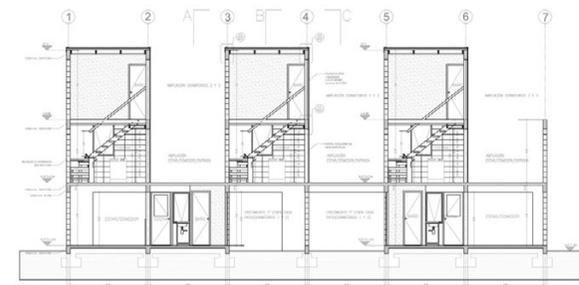
1st Floor Plan



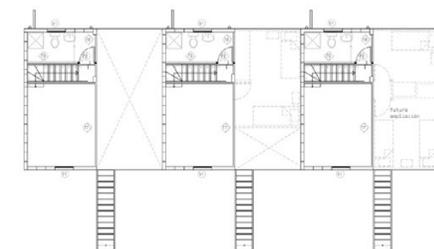
Front Elevation



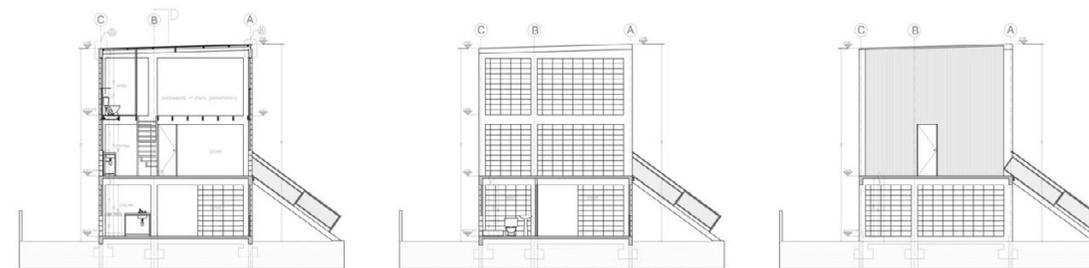
2nd Floor Plan



Cross-Section View



3rd Floor Plan



Elevation and Section Views



Site Plan



Interior Views



CASE STUDY 2

The Butaro District Hospital

Location: Burera District, Northern Province, Rwanda

Architect: MASS DESIGN GROUP

Project Type: Hospital

Project Size: 64,583 sf

Project Year: 2011

Takeaways:

- Built together with the community
- A high-quality facility that enhances healing, where there was a shortage of health institutions
- Used funds for the project to stimulate the local economy
- Helped develop skilled labor
- Inspired care for the facility by the community
- Used locally available materials and labor to lower cost and construction-related impact



CASE STUDY 3

345 Telenor Campus

Location: Islamabad, Islamabad Capital Territory, Pakistan
 Architect: Arcop Pvt Ltd.
 Project Type: Office Building
 Project Size: 394,600 sf
 Year Built: 2017

Takeaways:

- Application of rammed earth for a large scale building
- Highlights a successful construction with earth materials
- The tallest rammed earth structure
- Use of locally available materials
- Appeal and quality of insulated rammed earth and its practicality



CASE STUDY 4

Hanil Visitors Center & Guest House

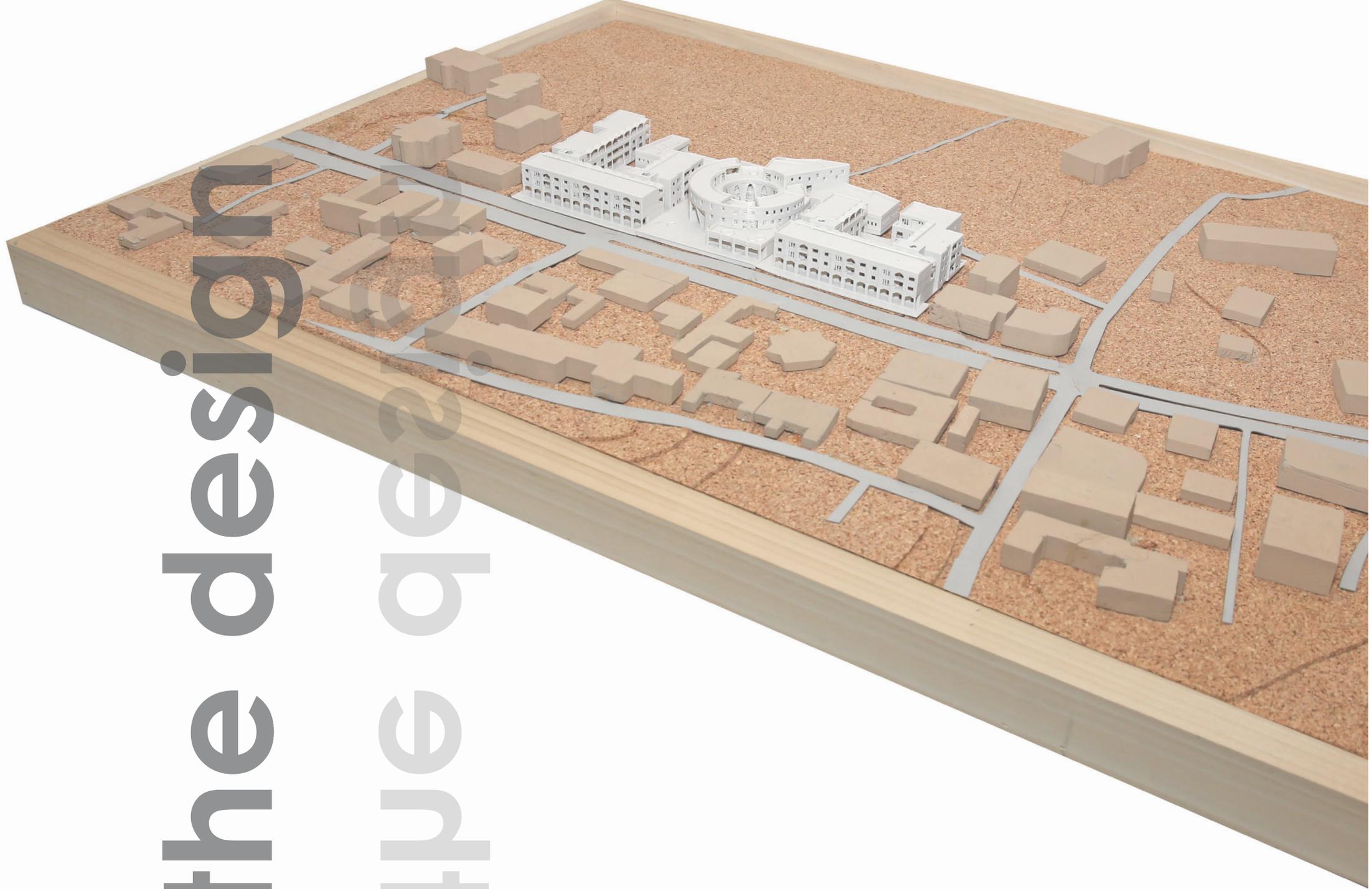
Location: 77 Pyeongdong-ri, Maepo-eup, Danyang-gun, Chungcheongbuk-do, South Korea
 Architect: BCHO Architects
 Project Type: Visitors Center
 Project Size: 42,600 sf
 Year Built: 2009

Takeaways:

- Successful application of concrete debris back into buildings from gabion wall and gravel beds to solid concrete structures
- Opportunities in recycled concrete related construction



the design
the ques



Having sorted through the issues circling Raqqa and the need for rebuilding, the thesis is a proposal about meeting the basic need of shelter first, and then ultimately to help the residents together with the surrounding community reach some level of self-sufficiency. As such, the communal campus incorporates housing, shops, a clinic, an elementary school, a vocational training wing, a multi-purpose community hall, a youth recreation terrace, and a cafe. The desire for such a multi-purpose campus is born out of the realization there is a lack of each of these buildings and facilities.

As there exists shortage for skilled labor and resources in the city, the building of the campus relies partly on the community that would go through speedy training to have all hands on deck, and then collaborate with trained professionals for the best result possible.



CAMPUS ENTRANCE VIEW



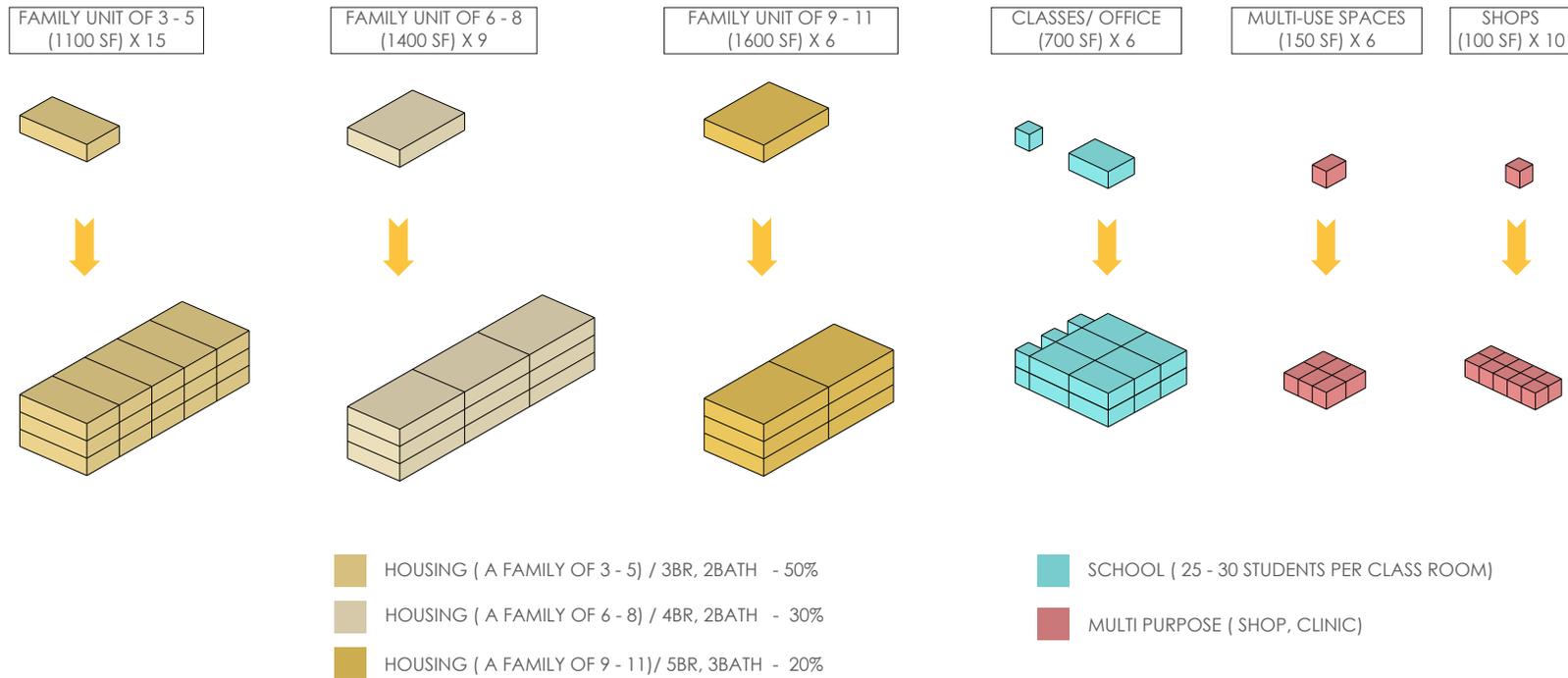
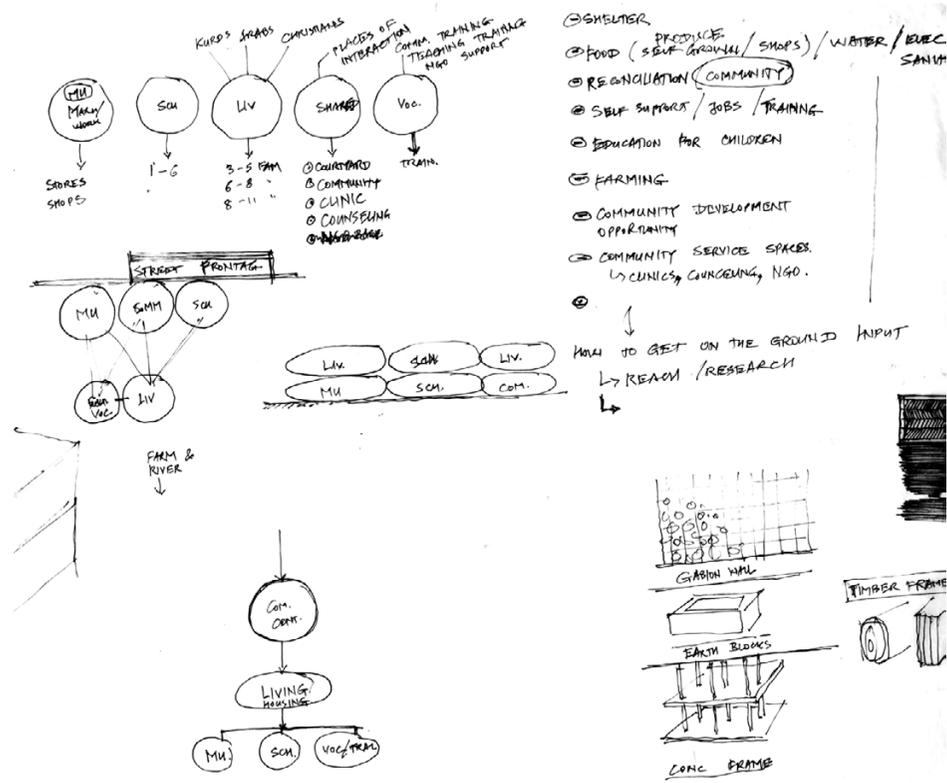
The communal campus as much as it is about putting up a new building for shelter and other community needs, it is also intended to clean up the site from the vast quantity of debris that is present while also putting most of that back into the life of the new campus. An approach such as this also has the potential to heal the lingering sense of loss, and of course not to make it confrontational but to repurpose and redefine the meaning associated with the ruin. Furthermore, because the community that will take ownership of these buildings will participate in the rebuilding effort, it will empower each person to find his or her peace through the act of building from the ashes, instead of seeking out an untouched piece of land, which is a none starter as change agent or a catalyst for rebuilding.



The exploration of programs began with defining what could fit on the small scale lot and not exceeding three stories of the height based on the neighborhood.

As the campus targeted women households, who may not have the skill or the income to support themselves while raising their children and supporting relatives like their parents. Hence, a program that could provide the most for each of these residents became important categorized under a place to live, work, and educate.

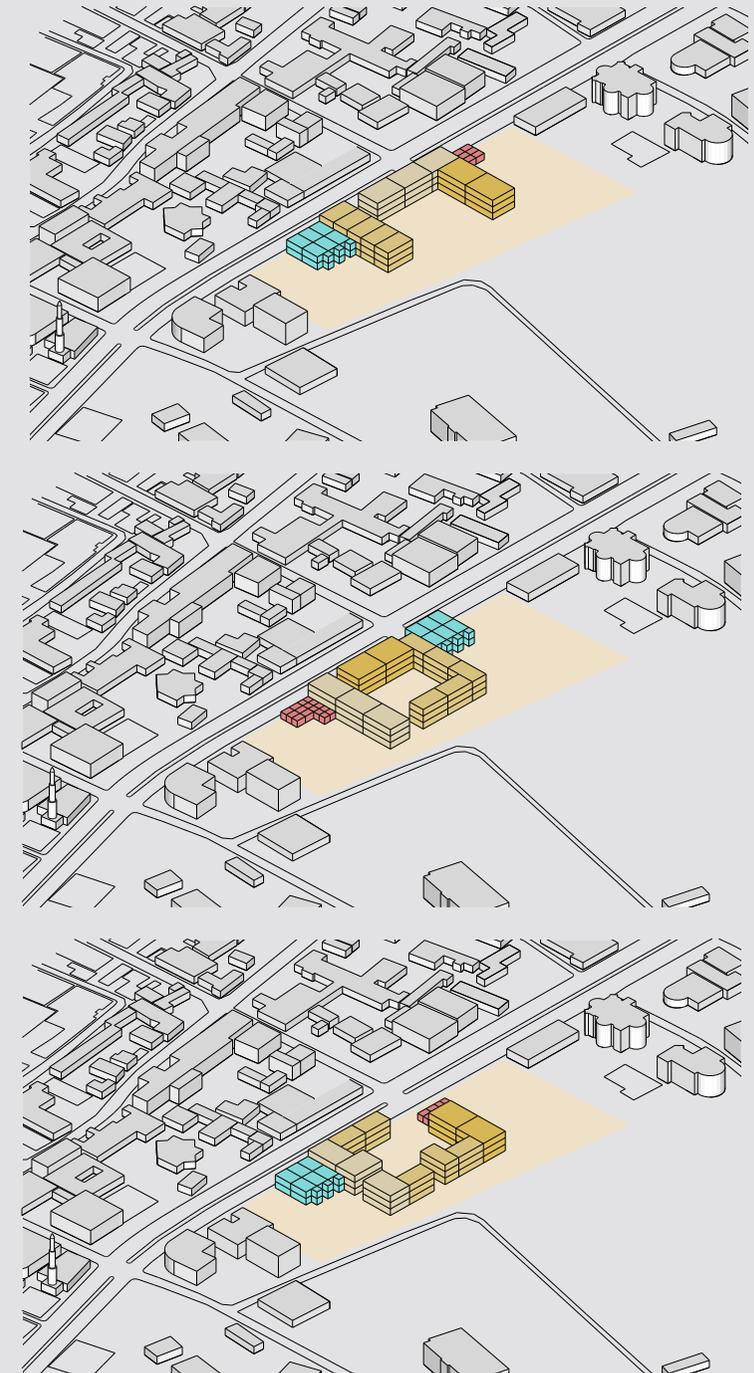
With the current average number of children in Syria being 3, typical family sizes were then created to determine the size of each unit, to then develop the overall ratio, density, and footprint within the campus together with the shop and school components of the campus.



The early massing diagrams show the overall coverage the buildings can have on the site. They also serve to analyze and incorporate more design features and programs, thereby maximizing the opportunities that are particular to the location.



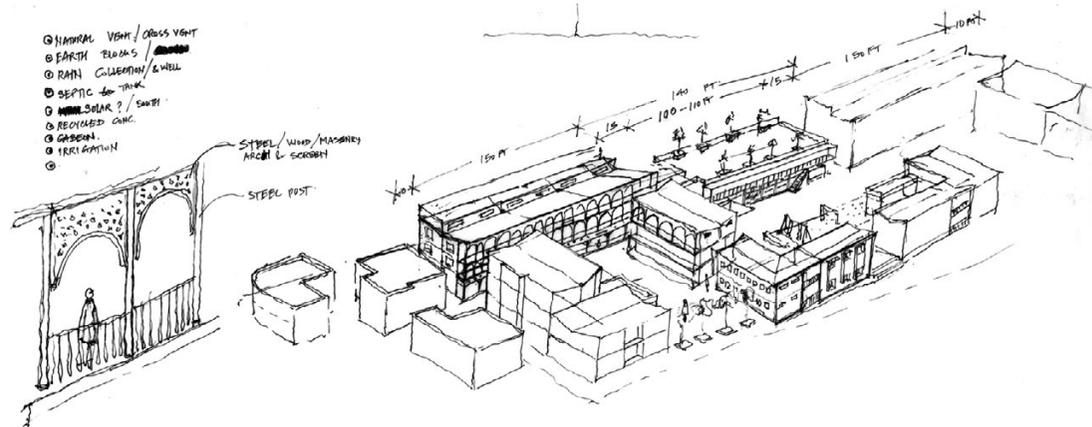
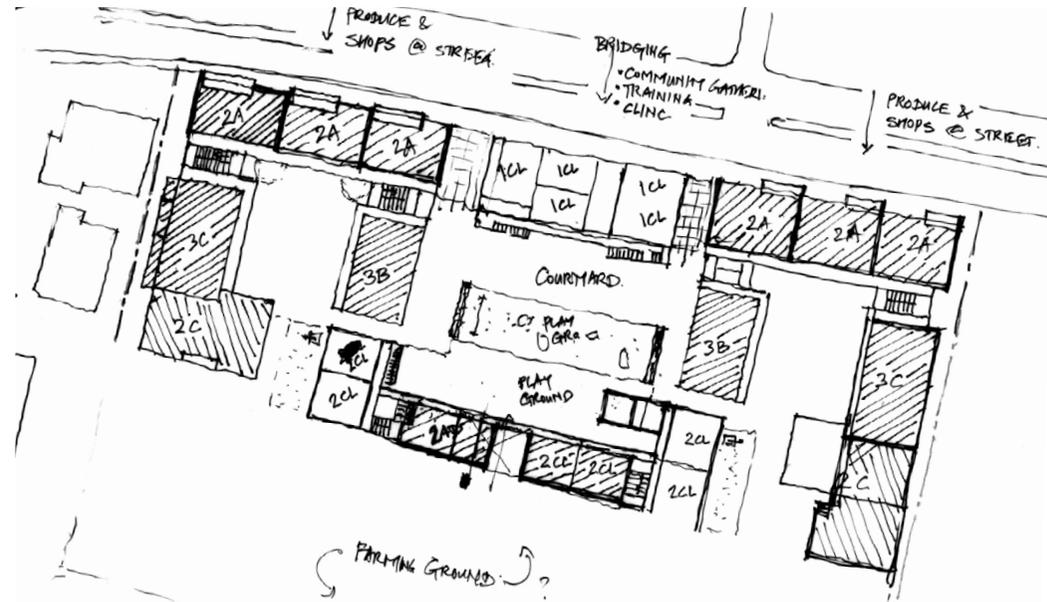
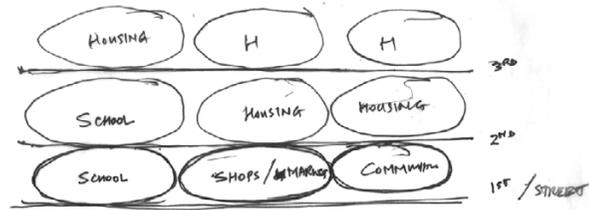
Some reading of the massings, for example, begins to highlight the type of relationship that may exist in height, orientation, private and public spaces, opportunities for natural ventilation, adjacencies, etc.



As a campus intended to restore some of the qualities many Syrians pride themselves with, in terms of tolerance among its residents such as sectarian differences, the design uses a series of courtyards that are interconnected.

Three stories of residential wings, with each having a courtyard, are connected to a community center that supports the needs of the residents and the neighborhood beyond. The courtyards are about having human interaction with varying levels of privacy intertwined around them as a place of interaction.

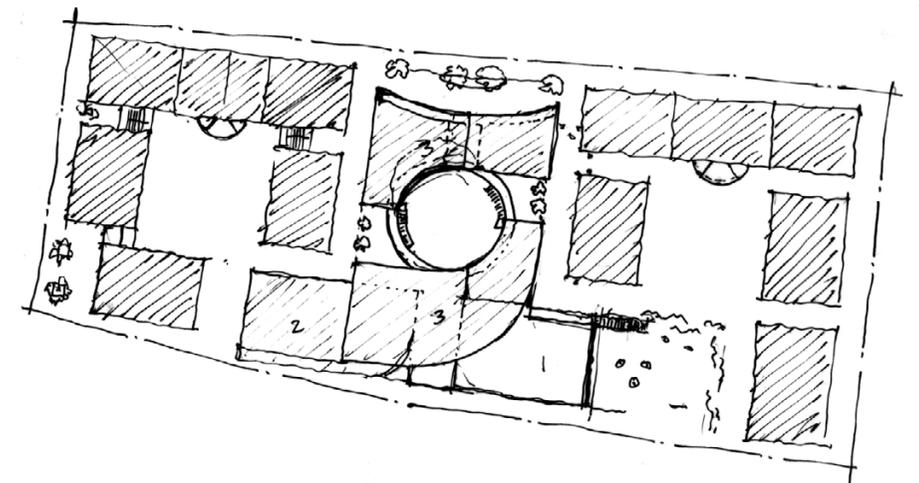
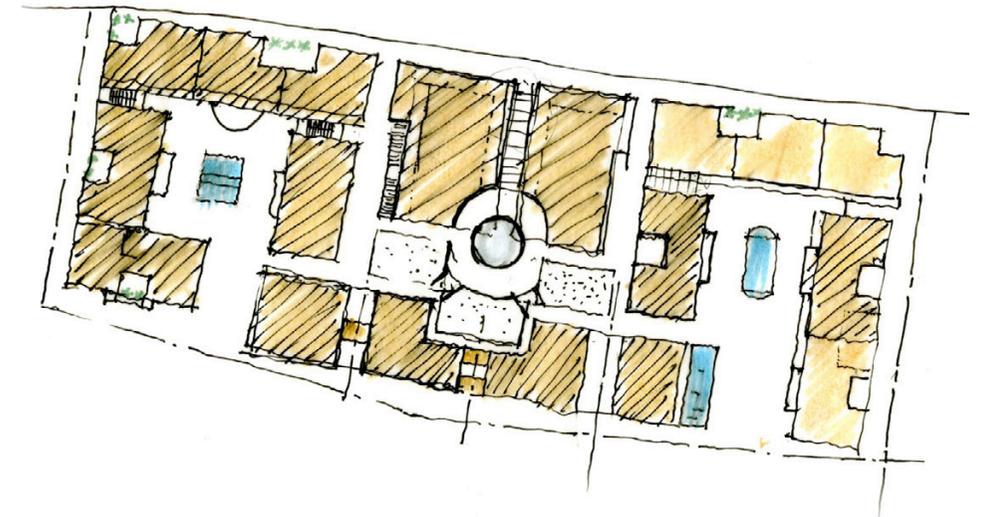
- HOUSING
- SCHOOL (K-6)
- SCHOOL (JABARA)
- SHOPS - BAKERY
- PAstry
- PRODUCE & FRESH VEGETABLES/PRODUCE
- COMMUNITY - GARDENING SPACE
- CLINIC
- COURTYARD



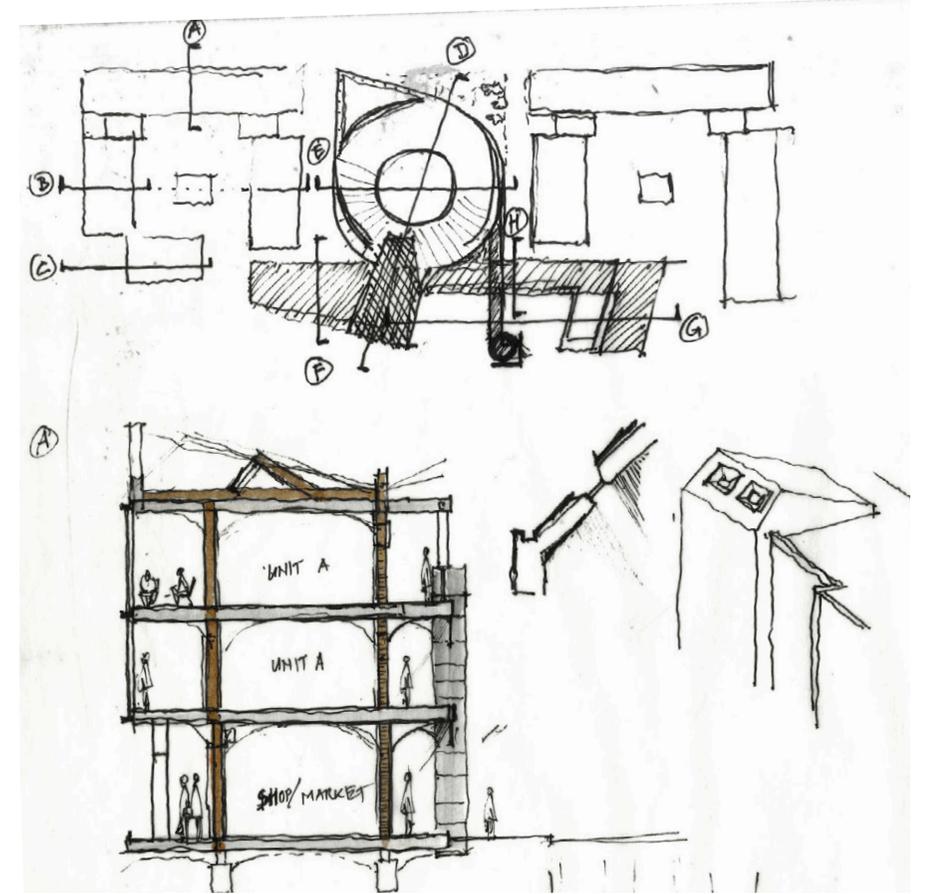
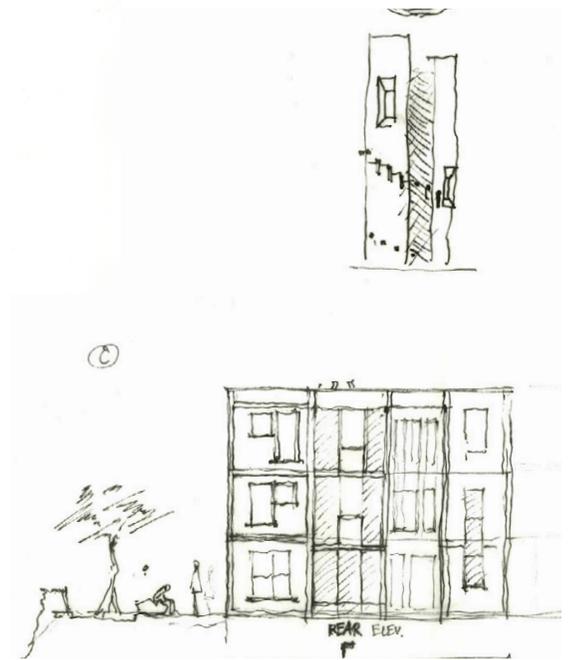
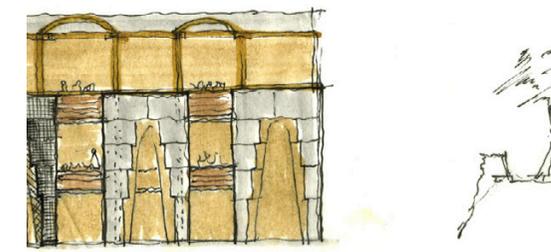
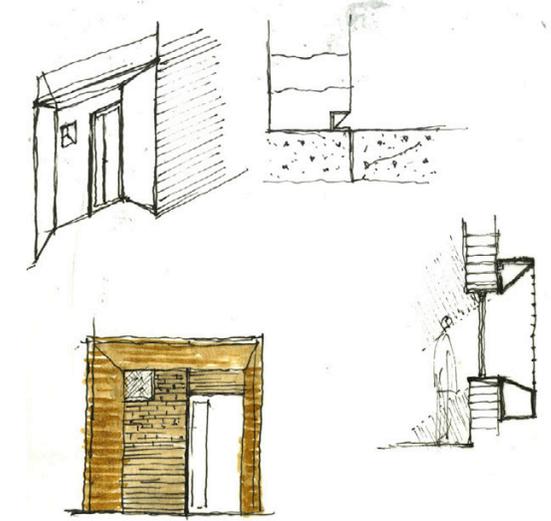
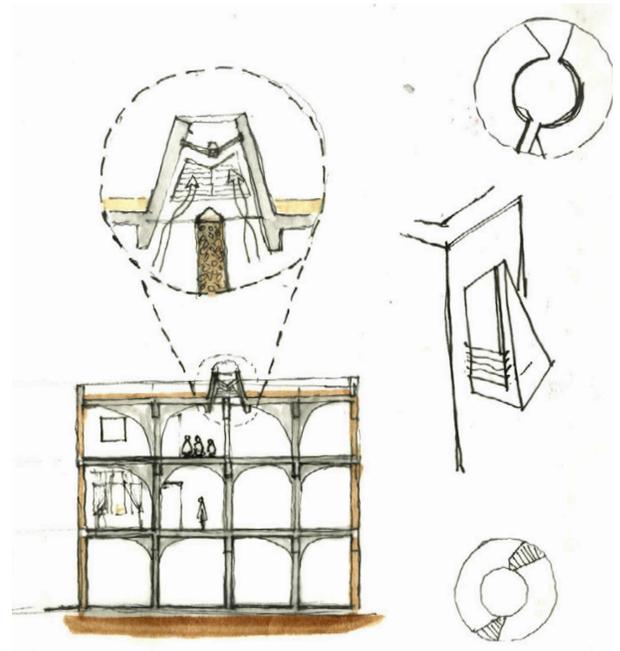
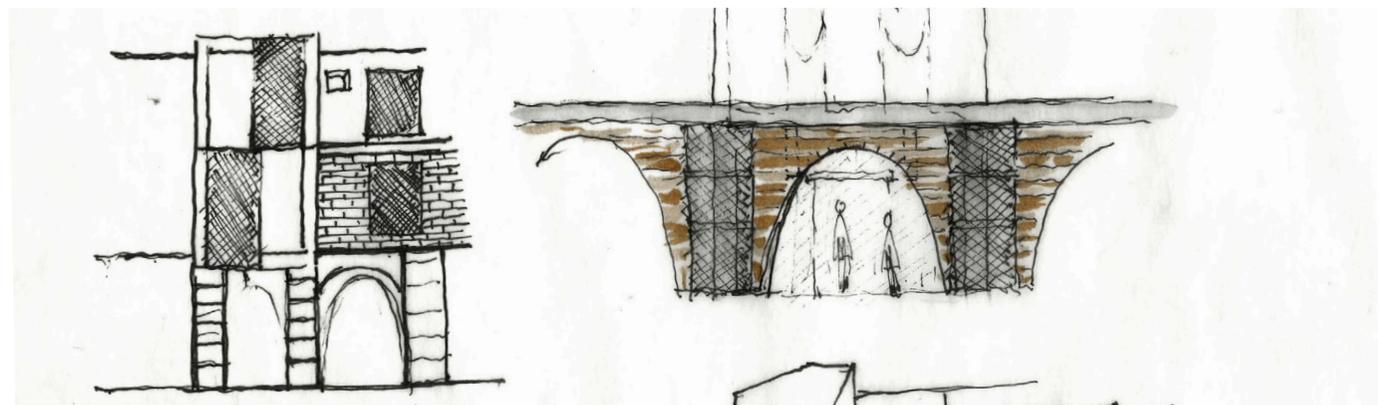
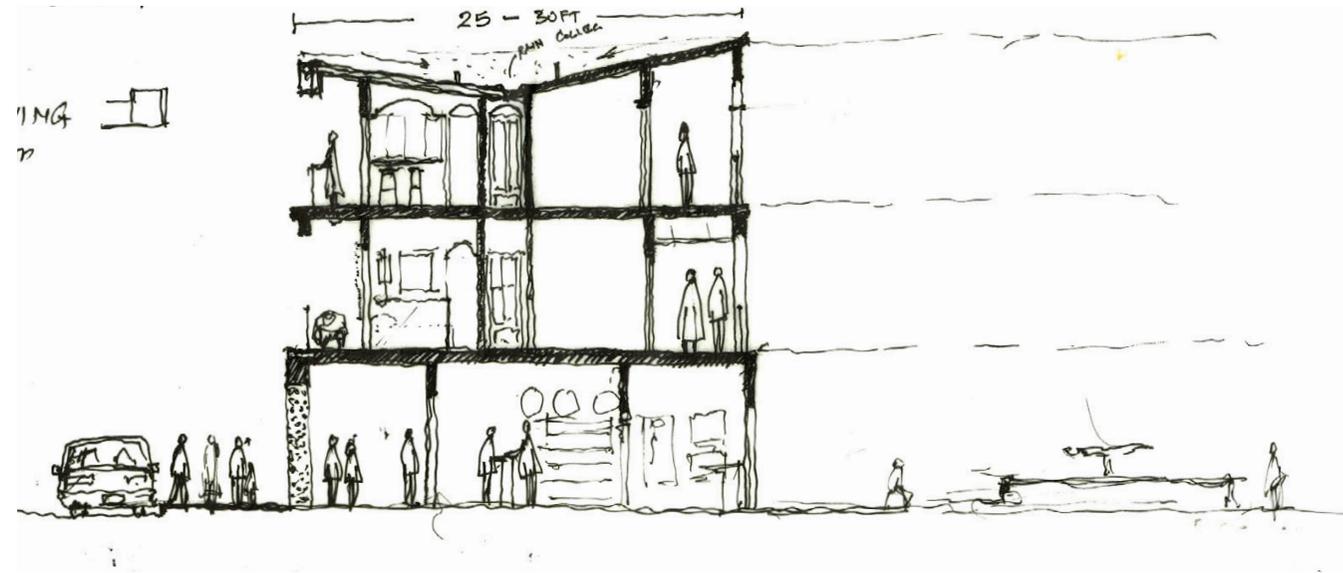
The series of courtyards being the heart of the campus, shops located under the residential wings at the street level are incorporated to create an active place of interaction. These shops are also intended to primarily be a workplace for the residents who likely would be women breadwinners. The shops then provide them with a space to learn and work in crafts, bring good or produce for sale from the farms nearby enabling them to support their families while also building a tight knit community.

The central community building on the other hand incorporates a clinic, schools and workshops for children and adults, a produce teaching roof farm, operation spaces for local charities and organizations, a gathering and worship hall, as well entertainment and recreation spaces which all together can form an active and vibrant complex for rebuilding and support of the surrounding community at many levels.

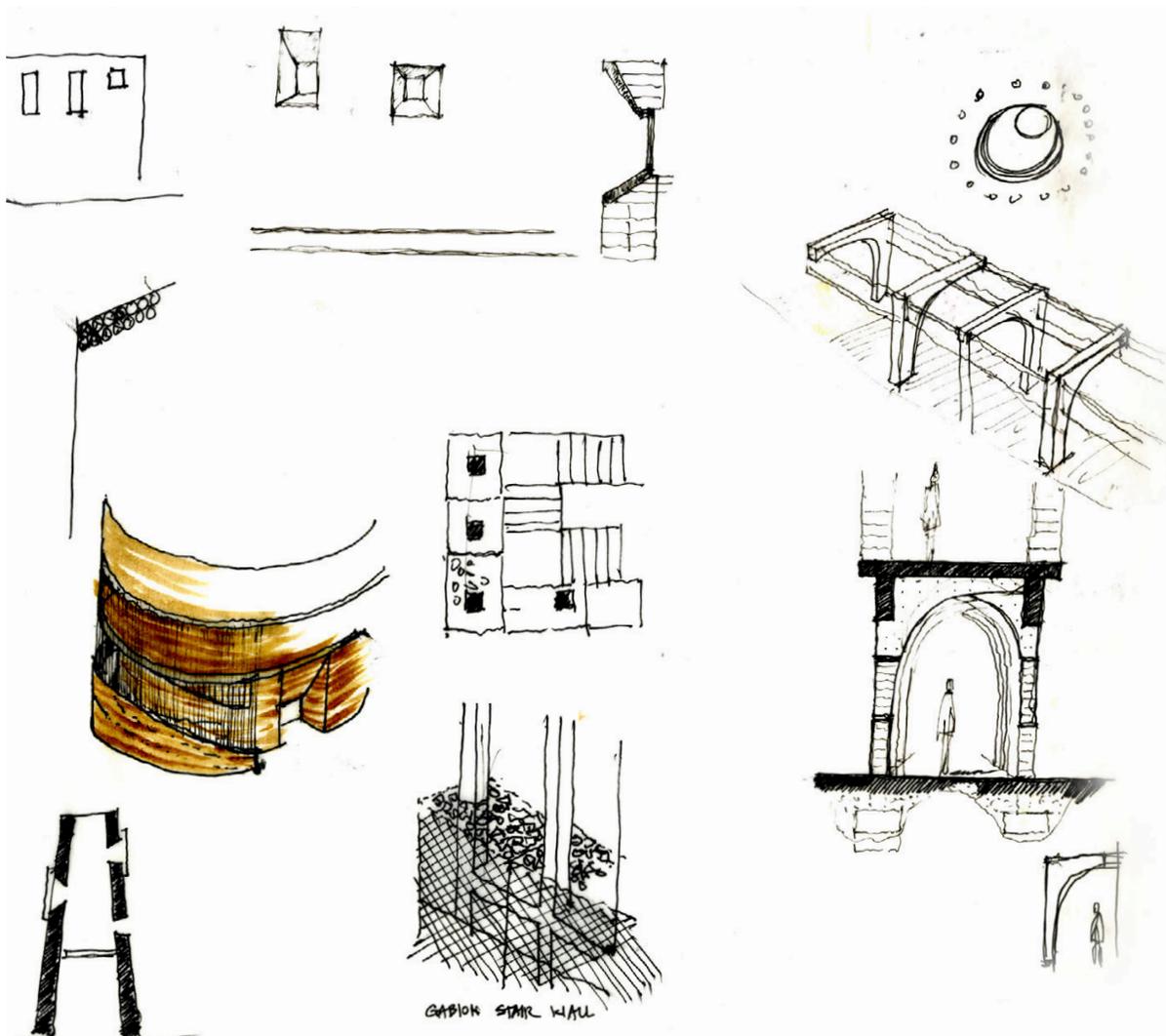
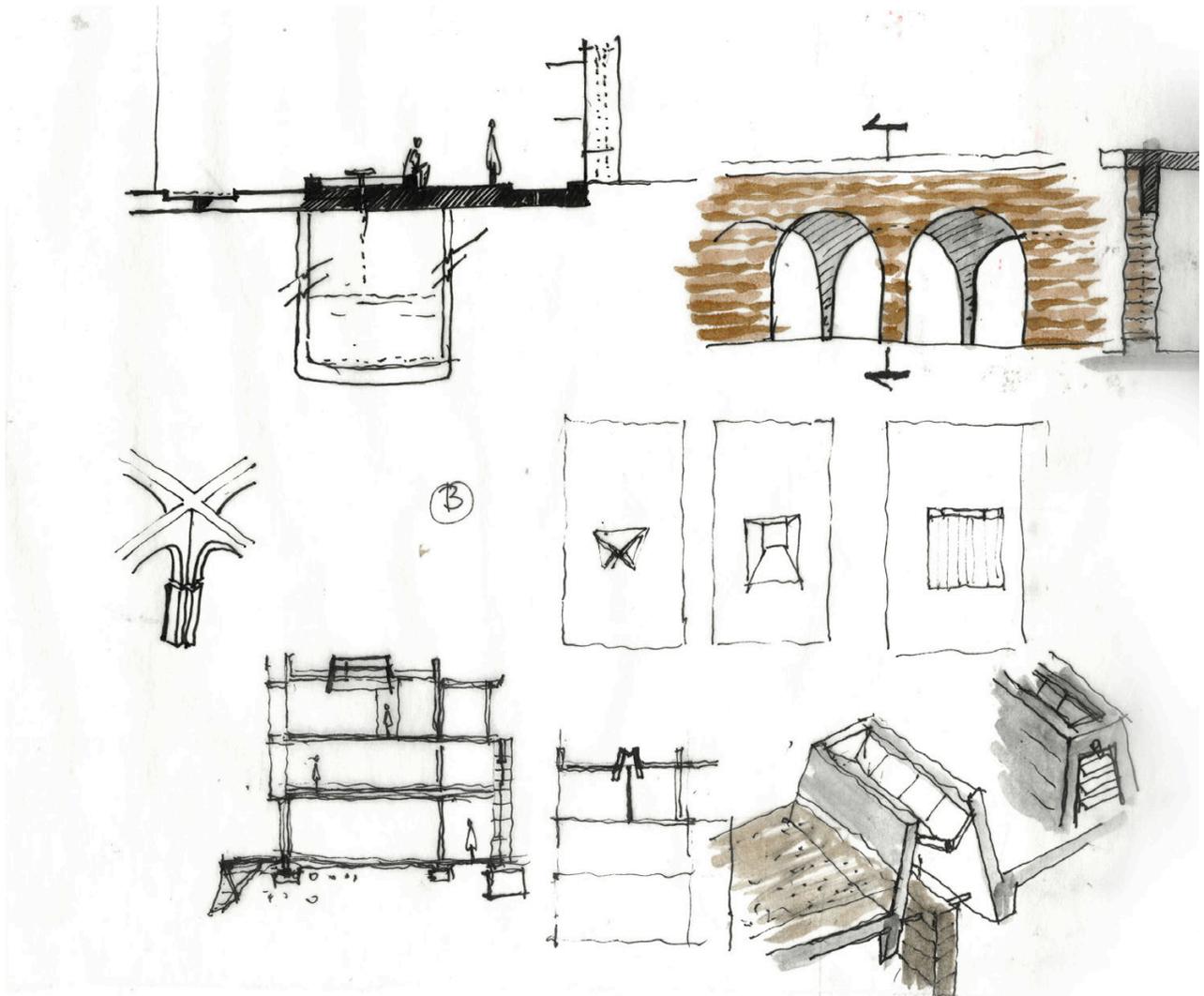
To support different family sizes in the complex, each residential wing based on the size of the site is made up of three unit types; 6 units of smaller family size to the north (Type A units), 6 units for mid-size families on the outer side edges and to the south (Type B units), and 3 units for large size families on the inner sides of each wing. Together, the campus has 30 units able to host 220 residents but is capable of accommodating more than that as the families grow in size.



Section And Elevation Study Sketches



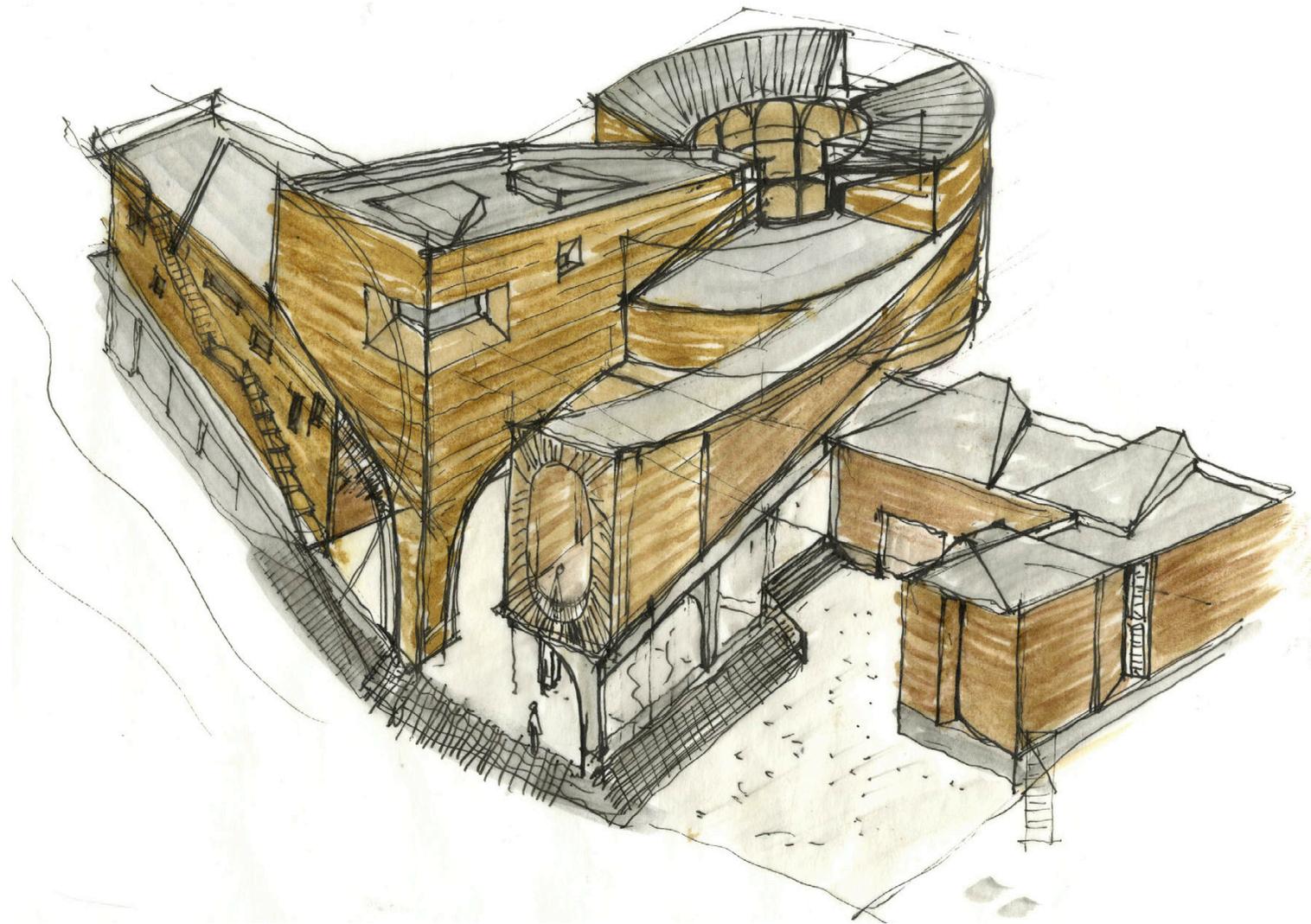
Sections, Elevations and Perspective Study Sketches



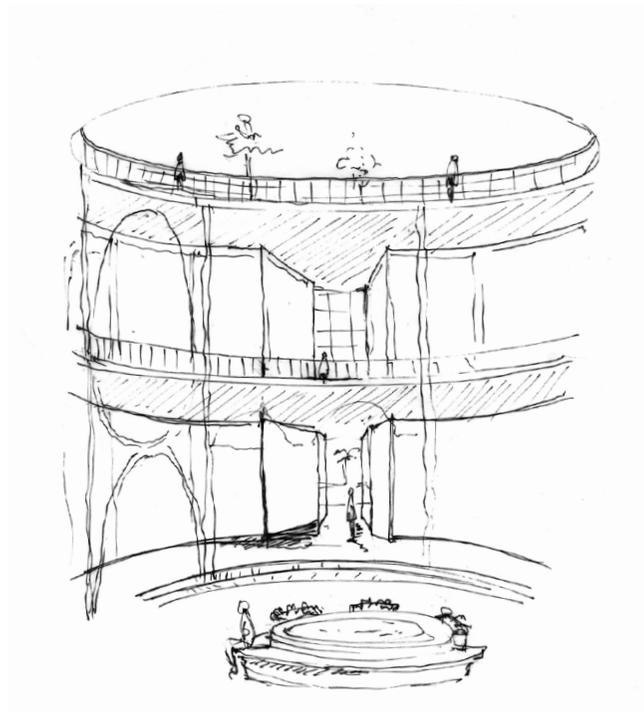
Elevations and Perspective Study Sketches



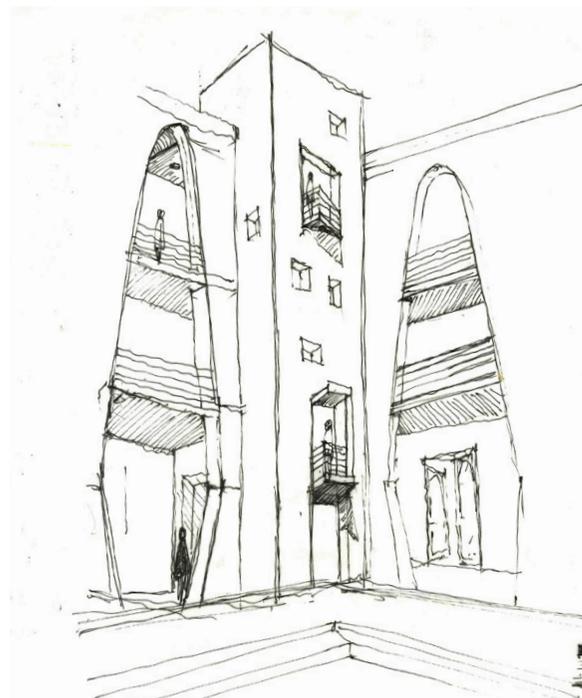
Partial south elevation of campus



Perspective view of community center building

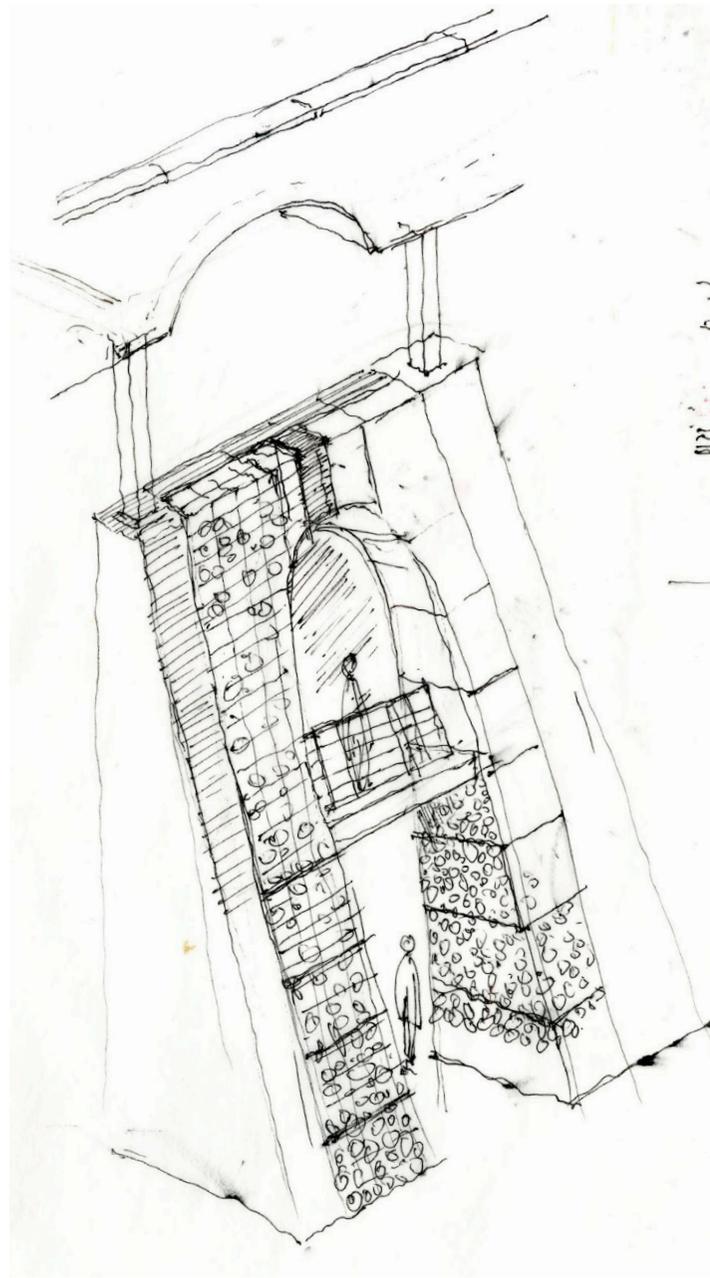


View of community center building courtyard



View of residential wings courtyard

Elevation, Section and Perspective Study Sketches



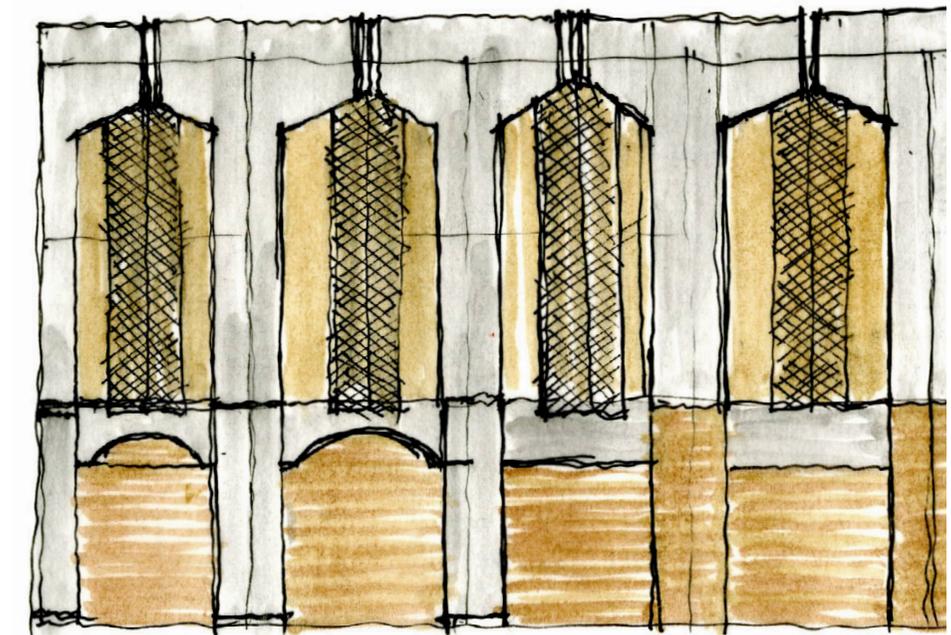
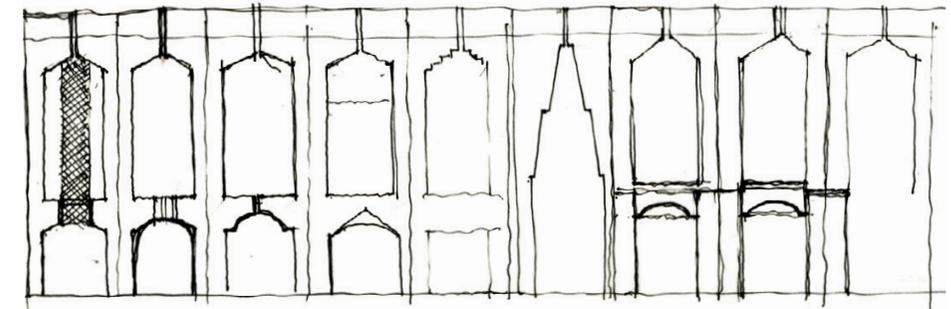
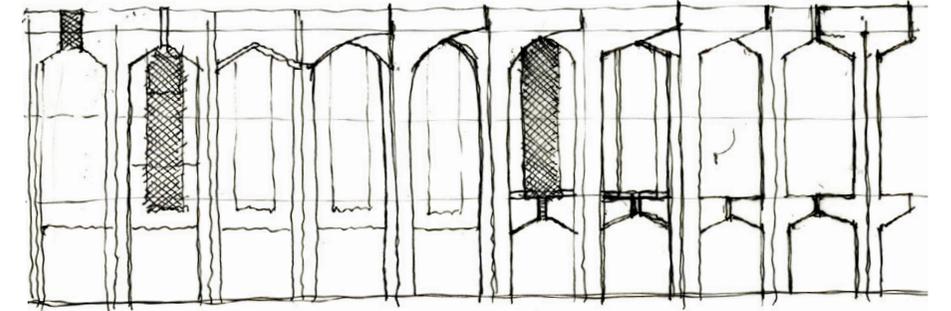
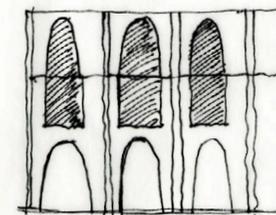
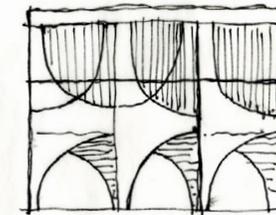
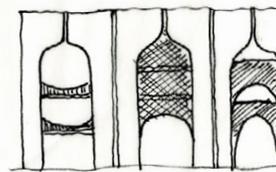
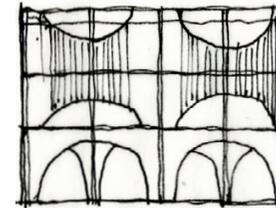
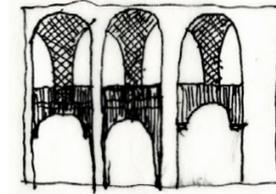
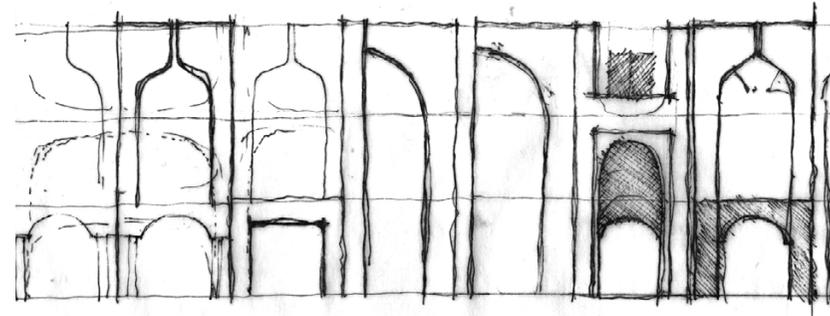
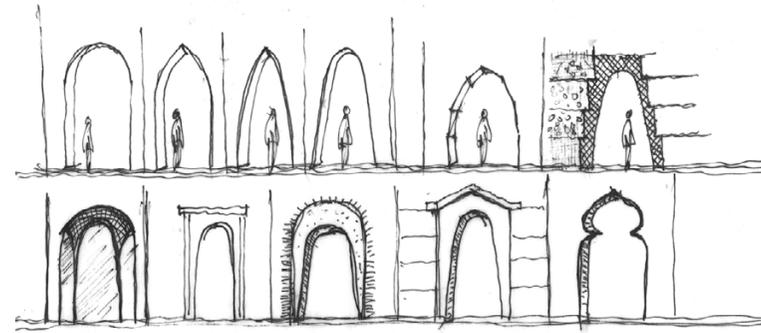
Views of residential wings courtyard archway

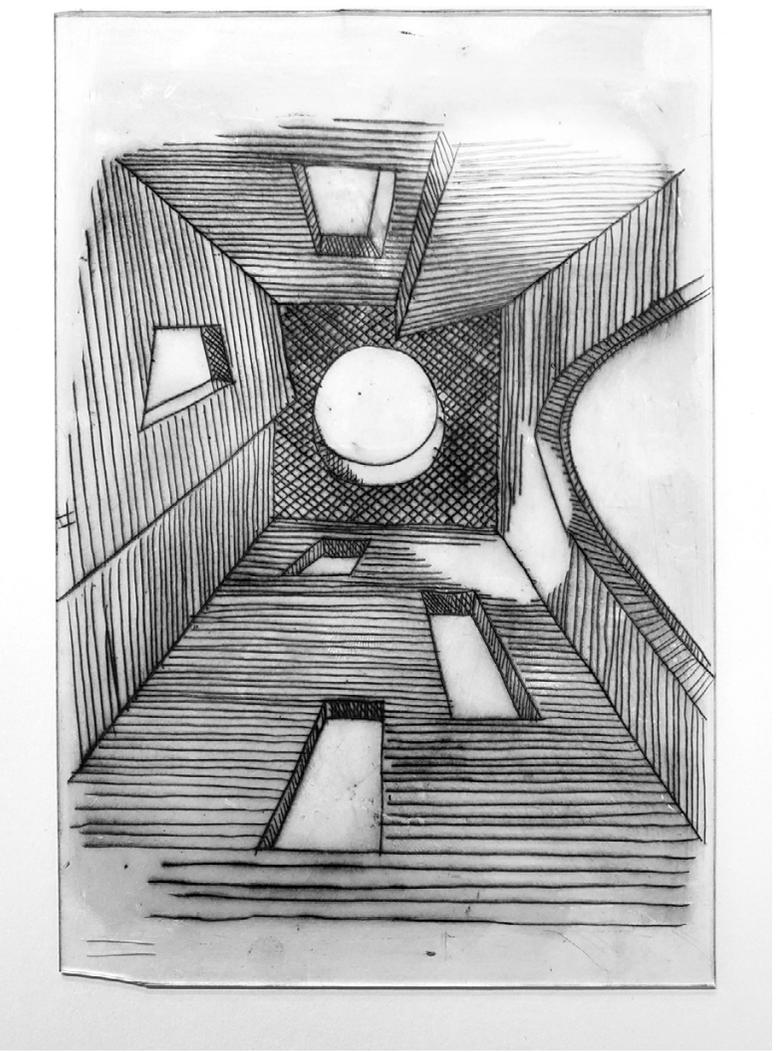
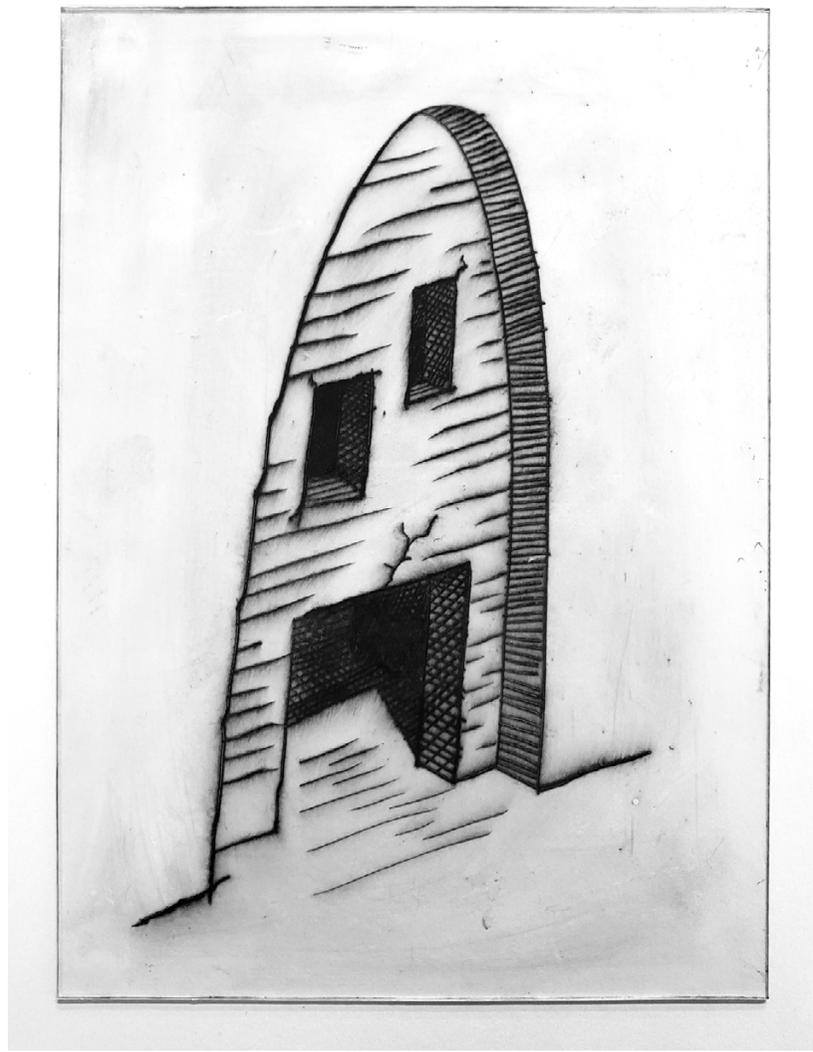


Taking advantage of the available debris on the site, monumental two-story gabion archways are created in combination with metal screen walls made partly from recycled wire mesh and roads on the site.



Arches Study Sketches





While the chosen neighborhood is sparsely populated, the campus is designed to fit on a 2.25 acre/ 9000 square meter site providing housing together with a community center building.

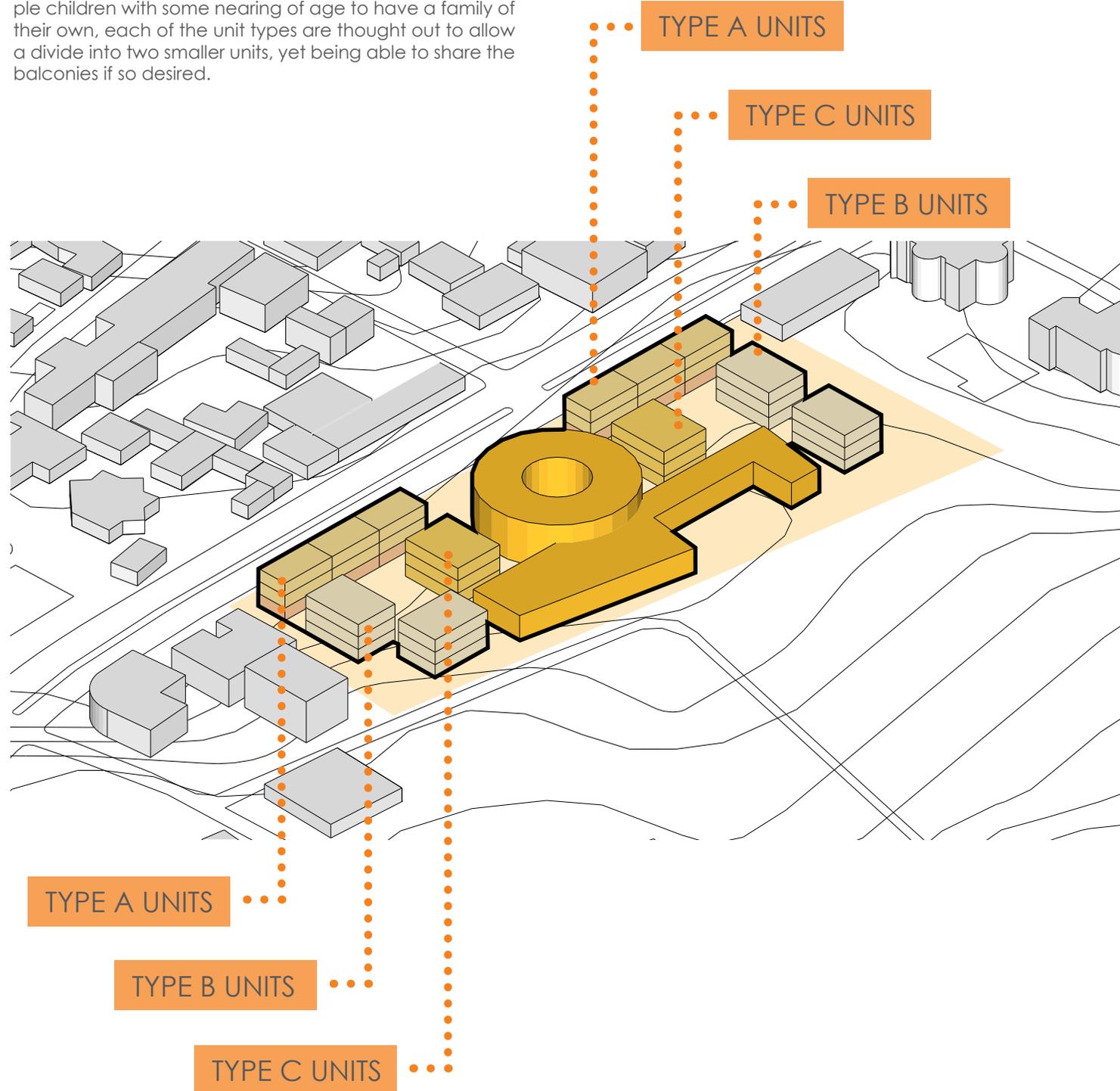
Because the site is located in the city periphery with comparably fewer damaged buildings nearby, also resting against farmlands and a river beyond, it enjoys fewer confrontations with the ruins. Particularly for the younger population of the complex, such a setting is also meant to support their wishes and aspirations as they heal away from what they have lived through for years.



SITE PLAN



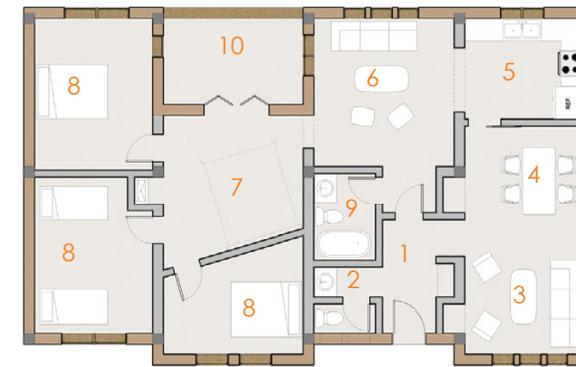
Given the incoming residents of the campus have multiple children with some nearing of age to have a family of their own, each of the unit types are thought out to allow a divide into two smaller units, yet being able to share the balconies if so desired.



Syria being a majority muslim country, when designing a muslim's home multiple factors have been considered and incorporated.

- Privacy of entrances, and place for removing shoes and cleansing
- Windows that enhance privacy
- Toilets not to be oriented facing Mecca/ Qiblah
- Having a dedicated place for worship/ Musalla
- Having a direction marker toward Mecca for worship
- Cleanse area for Musalla
- Incorporates nature
- Guest areas separated from family rooms and the rest shared spaces of the home
- Being spacious to allow diverse use
- Ideally separate the boys and girls bedrooms
- Balconies and porches which have privacy
- Is considerate of neighbors, not to block the sun and wind
- Considers the climate for passive heating and cooling

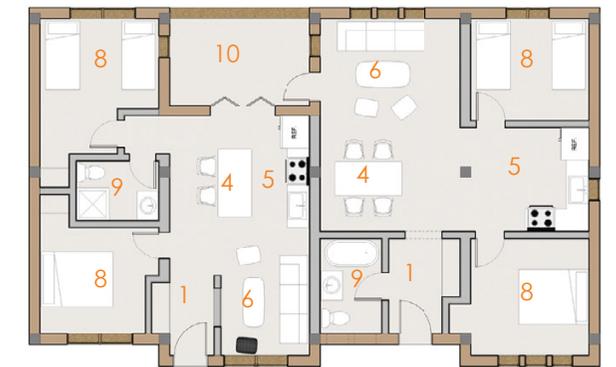
PROPOSED UNIT PLANS



TYPE A UNIT

- For A Family Of 3-5
- 1400 Sf (3Br And 1 1/2 Bath)

PROPOSED FUTURE PLANS



TYPE A1 AND A2 UNITS

- 650 Sf And 750 Sf Units (2Br And 1 Bath Each)

LEGEND

- | | |
|------------------|-----------------|
| 1. Entry | 6. Family Room |
| 2. Powder Room | 7. Worship Room |
| 3. Living/ Guest | 8. Bedroom |
| 4. Dining | 9. Bathroom |
| 5. Kitchen | 10. Balcony |



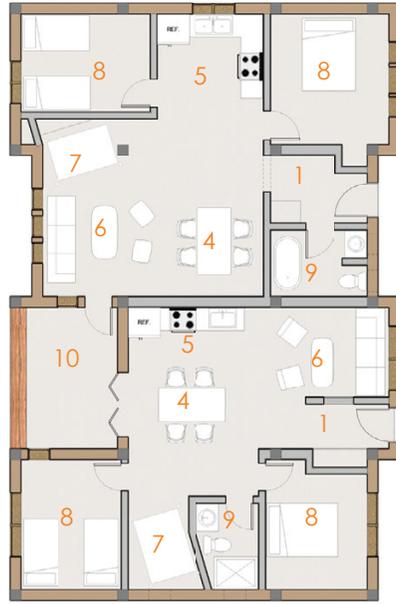
PROPOSED UNIT PLANS



TYPE B UNIT

- For A Family Of 6-9
- 1600 Sf (4Br And 1 1/2 Bath)

PROPOSED FUTURE PLANS

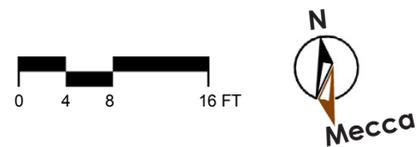


TYPE B1 AND B2 UNITS

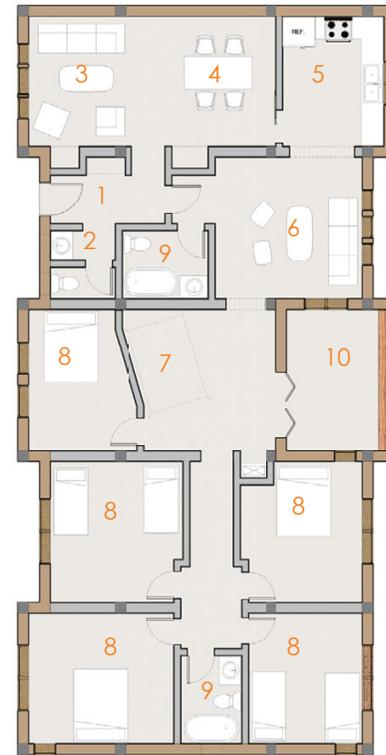
- 750 Sf & 850 Sf (2Br And 1 Bath Each)

LEGEND

- | | |
|------------------|----------------|
| 1. Entry | 6. Family Room |
| 2. Powder Room | 7. Prayer Room |
| 3. Living/ Guest | 8. Bedroom |
| 4. Dining | 9. Bathroom |
| 5. Kitchen | 10. Balcony |



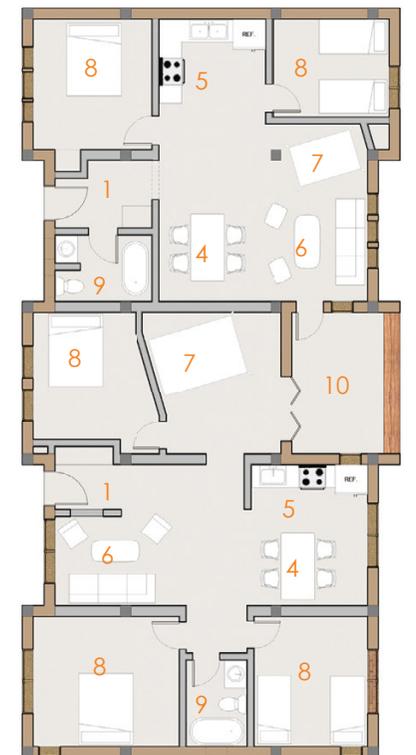
PROPOSED UNIT PLANS



TYPE C UNIT

- For A Family Of 10-13
- 2000 Sf (5Br And 2 1/2 Bath)

PROPOSED FUTURE PLANS

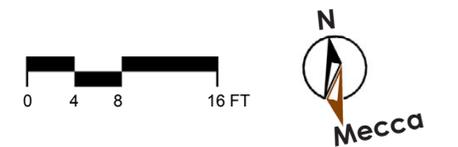


TYPE C1 AND C2 UNITS

- 800 Sf (2Br And 1 Bath)
- 1200 Sf (3Br And 1 Bath)

LEGEND

- | | |
|------------------|----------------|
| 1. Entry | 6. Family Room |
| 2. Powder Room | 7. Prayer Room |
| 3. Living/ Guest | 8. Bedroom |
| 4. Dining | 9. Bathroom |
| 5. Kitchen | 10. Balcony |



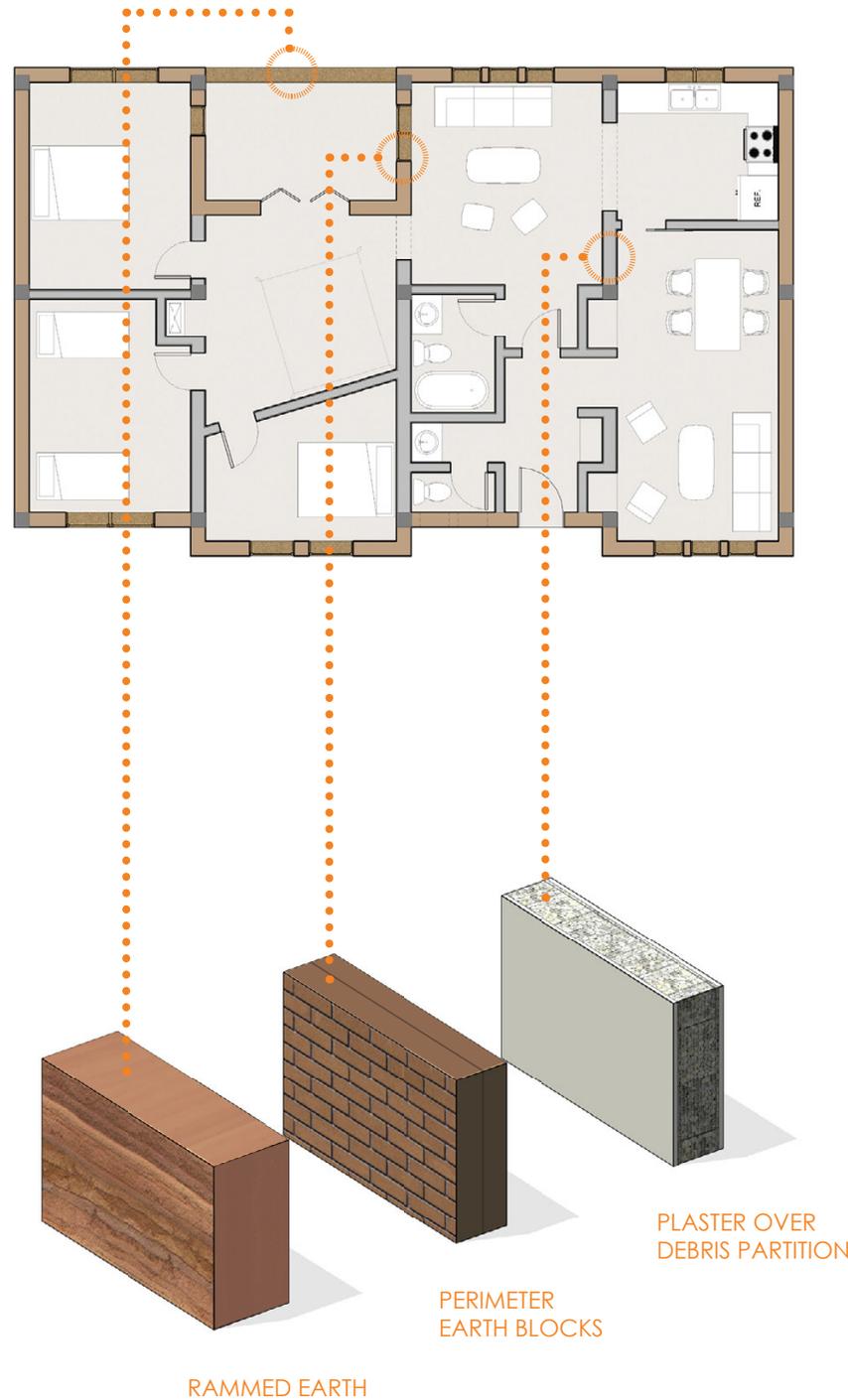
Based on the climate of the region, readily available time tested building materials, and ease of developing skilled labor, three wall systems are used together with concrete structural framing to build the campus.

- Rammed Earth
- Earth Blocks
- Debris filled concrete partitions and Gabion wall systems

Because of the thermal quality of earth blocks, which are machine pressed earth and cement mix blocks that can easily be produced on-site, the perimeter blocks of residential wings are built out this modest material.

On the other hand, the interior partitions of the units are built using debris from the site. To create the walls, small chunks of crushed concrete are filled into wood and metal lath partition which then is plastered over as a finish.

Rammed earth for this project is also selected for its thermal qualities, as well its tactile and visual appeal, while also being made out of a widely available material among others. But since building with rammed earth is more labor-intensive, its application is limited to the community center building and the street level shops to have more unity and continuity between the buildings of the complex.



COMMUNITY BUILDING MAIN ENTRY AND PLAZA VIEW

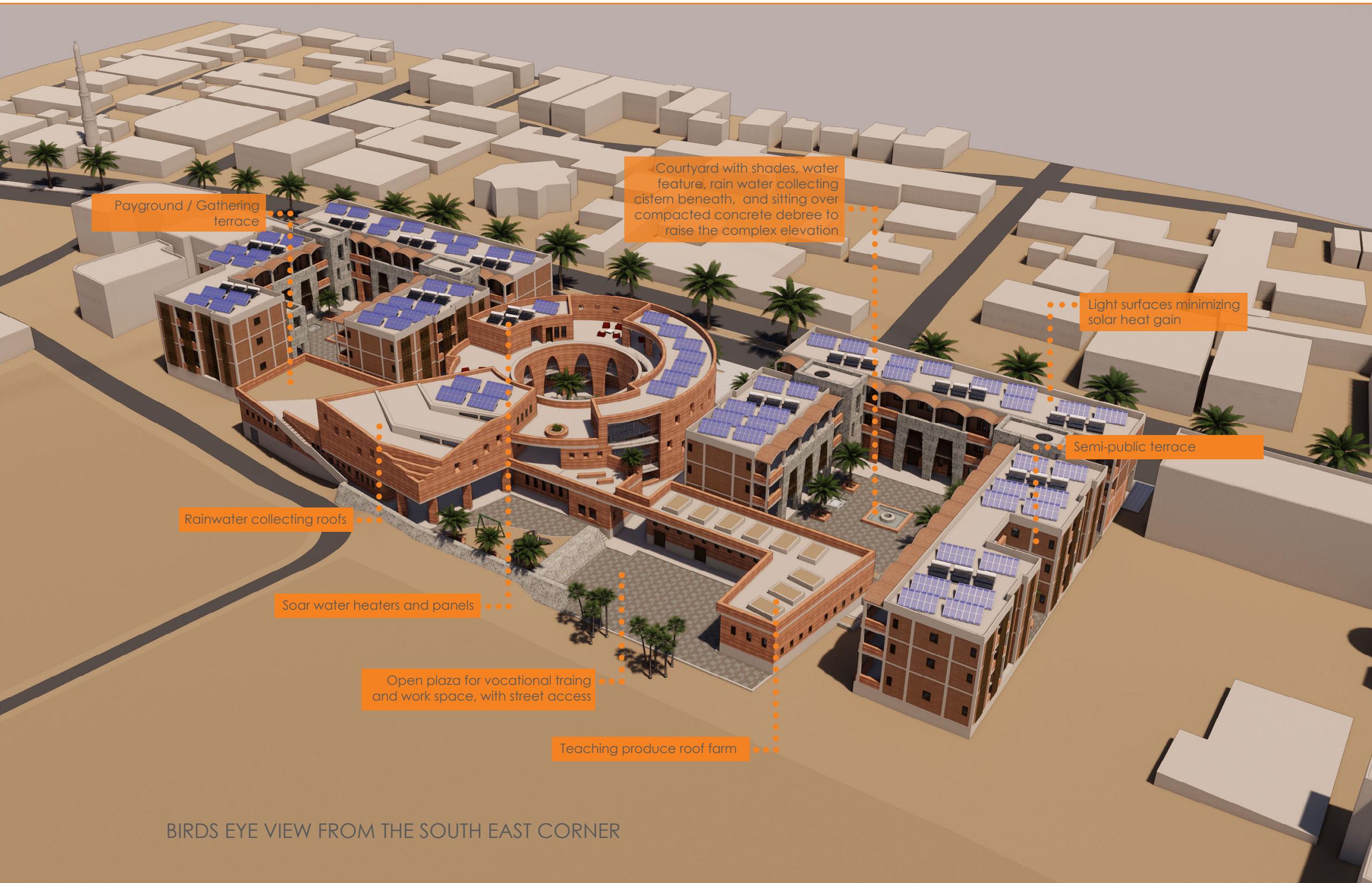


COMMUNITY BUILDING COURTYARD VIEW



COMMUNITY CENTER BUILDING COURTYARD

The round courtyard nestled in the community center is the hub of the whole campus complex serving as a bridge between the two residential wings while also connecting to the outside with its inviting large opening that shows off its courtyard. Also by having programs that draw in the community near and far, the courtyard is intended to be a place of relaxation for the youth, education for the community and the school, healing for the patients visiting the clinic, as well a resting stop for pedestrians from the shop and passersby.



Payground / Gathering terrace

Courtyard with shades, water feature, rain water collecting cistern beneath, and sitting over compacted concrete debris to raise the complex elevation

Light surfaces minimizing solar heat gain

Semi-public terrace

Rainwater collecting roofs

Solar water heaters and panels

Open plaza for vocational training and work space, with street access

Teaching produce roof farm

BIRDS EYE VIEW FROM THE SOUTH EAST CORNER



FIRST FLOOR PLAN

RETAIL & RESIDENTIAL WINGS

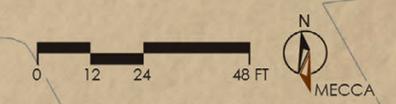
- 1. ENTRY
- 2. LIVING
- 3. DINING
- 4. KITCHEN
- 5. FAMILY ROOM
- 6. PRAYER ROOM
- 7. BEDROOM
- 8. BALCONY
- 9. STORE/ MARKET
- 10. STORAGE
- 11. COURTYARD
- 12. PATIO
- 13. SHOPS RESTROOMS

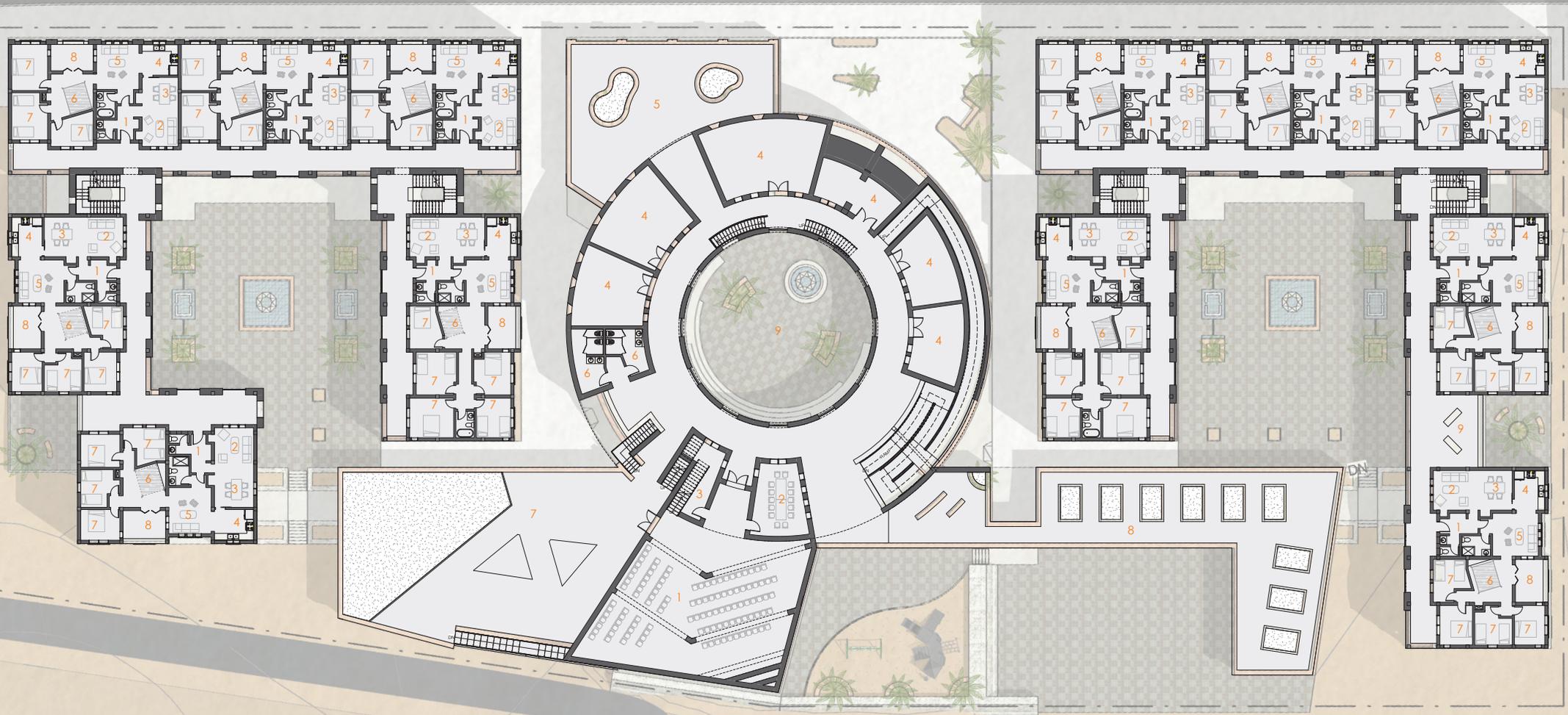
COMMUNITY BUILDING

- 1. COURTYARD
- 2. CLINIC LOBBY
- 3. NURSES STATION
- 4. EXAM ROOM
- 5. MEDICAL OFFICE
- 6. MEDICATION STORAGE
- 7. RECORD ROOM
- 8. PATIENT BED
- 9. STORAGE
- 10. BRAKE ROOM
- 11. UTILITY ROOM
- 12. PATIENT & STAFF RESTROOM

- 13. RESTROOM
- 14. SCHOOL LOBBY
- 15. PLAY ROOM
- 16. OFFICE
- 17. STORAGE
- 18. HALL
- 19. OPEN CLASS ROOM
- 20. CLASS ROOM
- 21. PLAY GROUND
- 22. SCHOOL OFFICE
- 23. RESTROOM

- 24. WORKING PLAZA
- 25. SHOP AND CRAFTS
- 26. COUNSELING OFFICE
- 27. OFFICE
- 28. ENTRY PLAZA





WING BUILDINGS

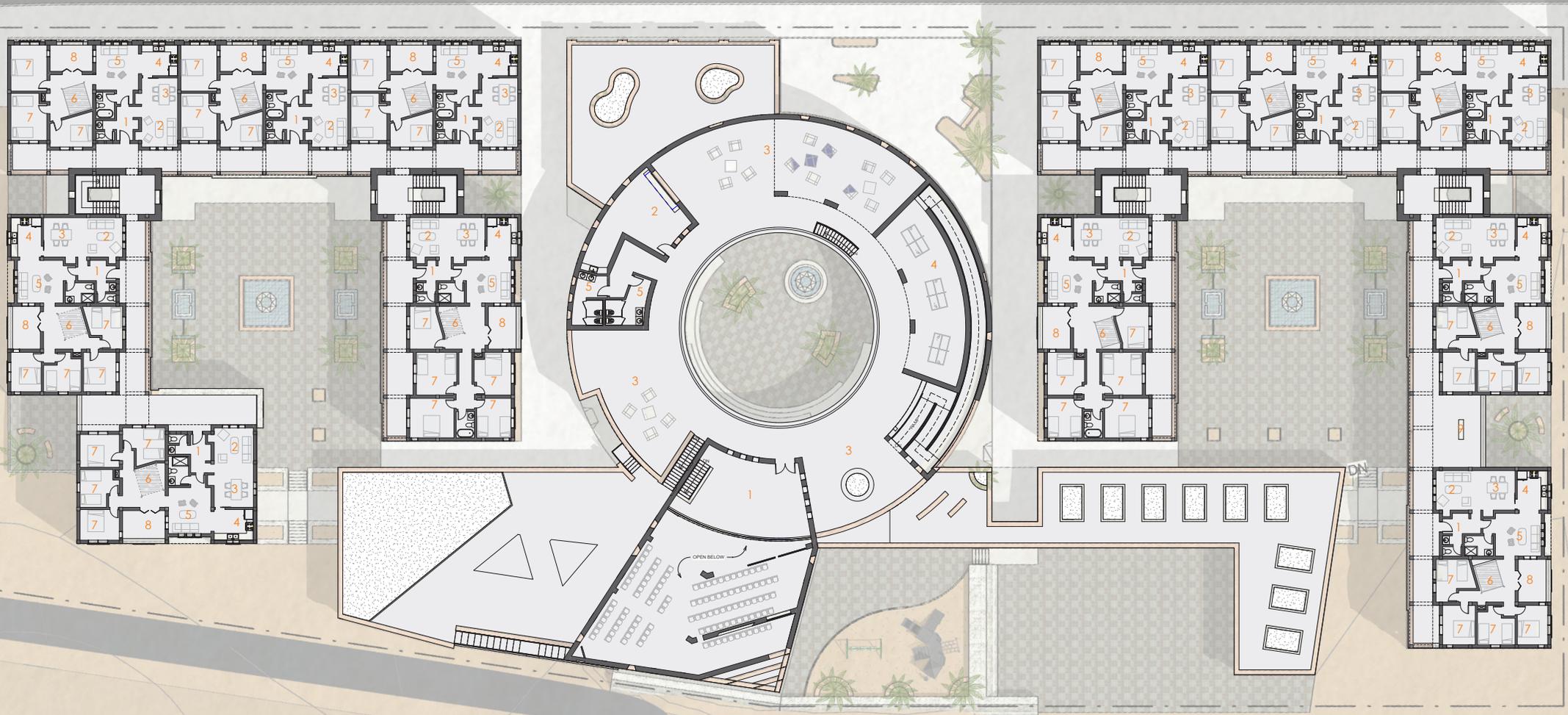
- 1. ENTRY
- 2. LIVING
- 3. DINING
- 4. KITCHEN
- 5. FAMILY ROOM
- 6. PRAYER ROOM
- 7. BEDROOM
- 8. BALCONY
- 9. SHARED TERRACE

COMMUNITY BUILDING

- 1. GRAND HALL
- 2. CONFERENCE ROOM
- 3. STORAGE
- 4. OFFICE
- 5. NORTH TERRACE
- 6. RESTROOM
- 7. PLAYGROUND / SOUTH TERRACE
- 8. TERRACE / ROOF FARM VA
- 9. OPEN TO BELOW

SECOND FLOOR PLAN





THIRD FLOOR PLAN

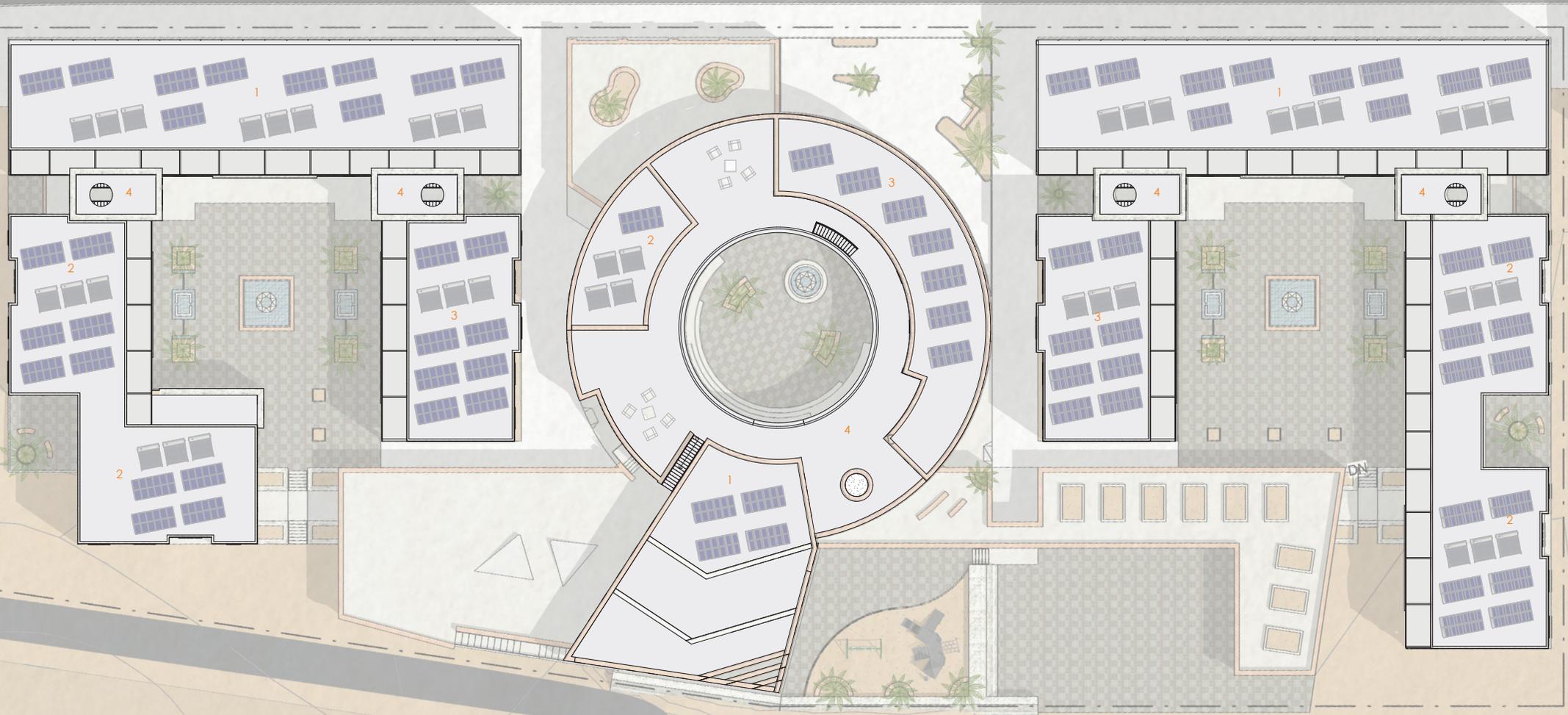


WING BUILDINGS

- 1. ENTRY
- 2. LIVING
- 3. DINING
- 4. KITCHEN
- 5. FAMILY ROOM
- 6. PRAYER ROOM
- 7. BEDROOM
- 8. BALCONY

COMMUNITY BUILDING

- 1. CONFERENCE ROOM
- 2. CAFE
- 3. SEATING/ LOUNGE
- 4. RECREATION
- 5. RESTROOM



ROOF PLAN



WING BUILDINGS

- 1. ROOF OVER TYPE A UNITS
- 2. ROOF OVER TYPE B UNITS
- 3. ROOF OVER TYPE C UNITS
- 4. ROOF OVER STAIR SHAFT

COMMUNITY BUILDING

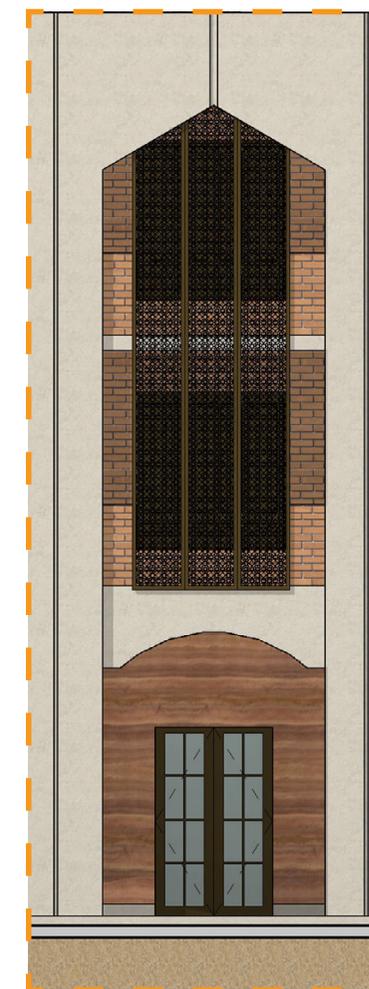
- 1. GRAND HALL ROOF
- 2. CAFE AND RESTROOMS ROOF
- 3. LOUNGE ROOF
- 4. TERRACE BELOW



NORTH ELEVATION



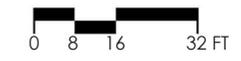
SOUTH ELEVATION



Screens to be made out of recycled steel meshes by local crafts men/ women, which are framed by the concrete arches and mounted into the earth walls, add a layer of privacy over balconies and windows of units while also creating rhythm on the street facades of the complex. On the other hand, the orthogonal concrete arches are meant to tie the building with some of the traditional arch styles of the region, yet adapted to fit the material used and for a contemporary look.



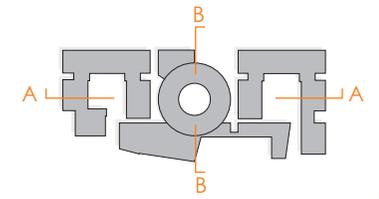
CAMPUS CROSS-SECTION A-A



COMMUNITY CENTER LONGITUDINAL SECTION B-B

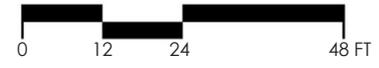


Each of the campus building is designed to collect rainwater from the roofs and plaza, which then can be purified for use in toilets, roof farms and for the fountains and evaporative cooling of the courtyards.





EAST ELEVATION



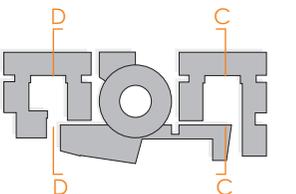
WEST ELEVATION



LEFT WING LONGITUDINAL SECTION C-C



COMMUNITY CENTER LONGITUDINAL SECTION D-D





Because the campus sits along the major Ar Raqqa - Deir-Ez-Zor highway, the street, and shops would likely become active as communities around the campus seek the services available.

CAMPUS STREET VIEW LOOKING EAST



Rows of shops serve the neighborhood bringing goods that are needed by the community like bakeries, local and homemade produces among others.

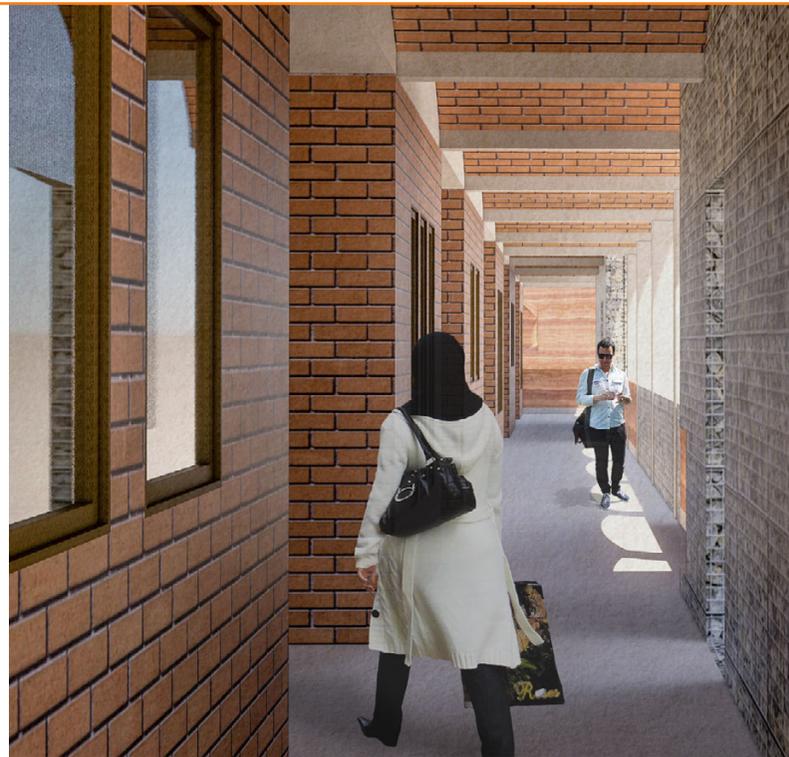
MARKET ARCHWAY



Unlike single-family home courtyards common to urban homes across Syria and the region, the residential wing buildings have a larger courtyard that can accommodate the population of the residents, while also giving direct rear access to the residents who run the shops.

A series of gabion archways and stair towers create a sense of renewal and healing for the residents as the ruins of the war are re-imagined into a new purpose that can set a direction for many cities of a similar fate.

By having the entrances of individual units pushed away from the rest of the facade, a layer of privacy is added in the units.



NORTH SIDE RESIDENCES CORRIDOR

Corridors along the residential units allow and enjoy a view of the courtyard while receiving some privacy and shading from the crafted on-site metal screens.



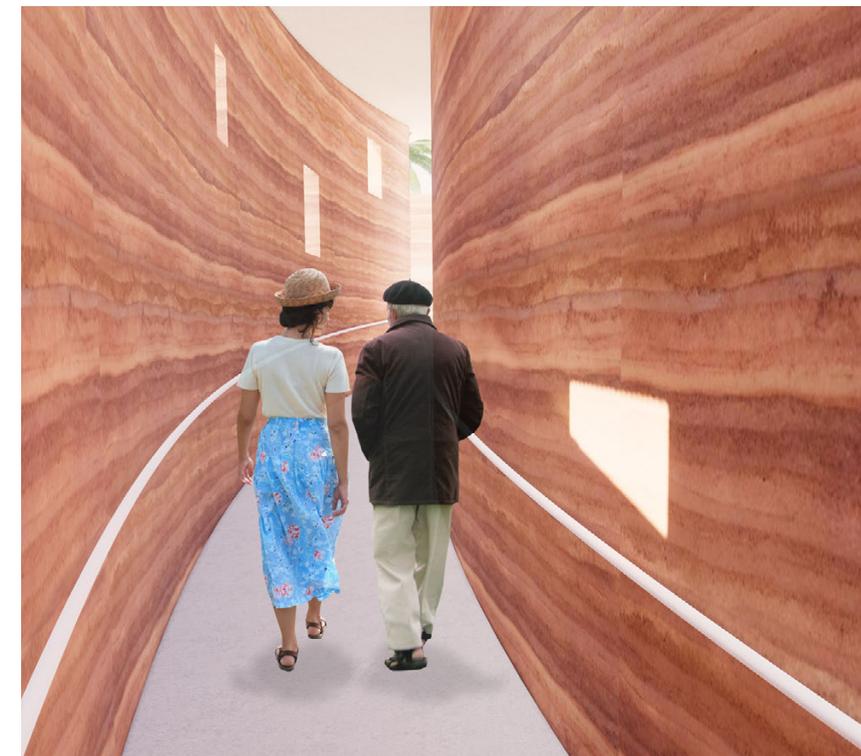
EAST SIDE RESIDENCES CORRIDOR

Outdoor terraces, similar to courtyards on the ground level, create more opportunities for users of the community building to interact and relax.



SECOND FLOOR TERRACE

Given the city has undergone through a civil war, the building is designed to accommodate those who may be handicapped by having an experiential ramp and passage in the community building which connects all levels of in the building.



PERIMETER RAMP

With the majority of the schools in the neighborhood being damaged or destroyed, the school offers a space of educating as many as 180 students targeting kindergarten to 6 graders for children of the residents as well the nearby community.



VIEW OF K-6 SCHOOL HALLWAY

Visually semi-secluded from the rest of the campus, the school provides play spaces which rests against the farmlands to the south. By sheltering the playground from the noise and realities of the rest of the city, the space is intended to help the children get back the childhood they have long been denied.



An additional play area, which can also serve during gatherings of the community hall, is designed over the roof of the classrooms. This roof area also enjoys the view into the farms to the south and the river beyond it.





VIEW OF THE COMMUNITY HALL



Raqqa has lost many buildings for the war, including mosques among others. Hence, the community hall is designed to serve the diverse needs of the community including for worship by orienting the prime corner of the hall towards Mecca, which is marked also by sun light that washes across three parallel roof openings as a spiritual marker. In addition, the use of rammed earth enhances spiritual quality of the space through its humble material, colors, ambiance and texture.



COMMUNITY HALL UPPER DECK



ROOF TERRACE LOUNGE AND RECREATION

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