

The Mind of the **UNHCR**

The Universalisation of Standards
and the Emergency Handbook
as the Invisible Architect of
Refugee Camps

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Preface

This thesis would not have been possible without the support and guidance of several people to whom I am deeply grateful.

First of all, I would like to thank my supervisor, Sven Sterken, and my co-supervisor, Sanja Banjevlav. Throughout the entire research process, they were always there for me and willing to help, leaving no single question unanswered. Whenever I was looking for a new angle, additional sources or a more refined theoretical approach, they assisted me with sincerity and enthusiasm. The feedback sessions were not only educational, but also truly enriching. Each conversation pushed my own thinking further and helped me view the research from angles I hadn't considered myself. Their dedication and commitment have truly made a difference to the quality of this work.

I would also like to express my sincere appreciation to Phoebe Goodwin and Patrick Mutai, who both made time for me even though they had busy schedules. Their generosity in sharing their professional experience and expertise was invaluable to this research. The insights they provided have brought the theoretical framework of the thesis into direct contact with the reality on the ground, and for that I am very grateful to them.

Finally and most importantly, I would like to express my sincere gratitude to my parents and my family. From the very first day of my studies until the last page of this thesis, their support was the one thing I could always count on. No matter how challenging the process became, they were always there with patience, encouragement and an unconditional belief in me that I myself did not always have. Whenever doubt arose, their confidence gave me the strength to carry on. Without them, this journey would have looked very different and for that - and so much more - I am infinitely grateful.

June 2026,

Phebe Vantomme

Abstract

The United Nations High Commissioner for Refugees (UNHCR) is universally recognised for its humanitarian role, but it also acts as a worldwide architect of the global landscape of displacement. This thesis repositions the organisation as a central architectural player by analysing how its internal guidelines and standard criteria, documented in a technical Handbook, function as the blueprints for refugee camps worldwide. The digitalisation of this Handbook in 2015 marked a crucial turning point, shifting the manual from a guide to a dominant spatial instrument that enforces a process of universalisation.

The research is structured in two main analytical perspectives: (1) Technical perspective: first, we delve into 'the mind of the UNHCR' by reviewing existing literature and peer-reviewed papers to shift the focus from humanitarian aid to spatial design. By combining these academic insights with a thorough analysis of the UNHCR's digital *Emergency Handbook* (2015), we identify the three key pillars - shelter, context around the shelter and management - which together form the organisation's 'ideal model'. This perspective defines the framework that the organisation will implement globally as a 'standard script'. (2) Implementation perspective: this 'ideal model' is evaluated on the basis of three in-depth global case studies: Greece (Europe), Kenya (Africa) and Bangladesh (Asia). Through a comparative matrix, we investigate whether this 'ideal model' is consistently applied across all these different contexts. Although the process of universalisation implies that the spatial outcome should be identical in every context, this perspective actually reveals the specific situations where this is not the case. By focusing on these inconsistencies, we analyse the tension between the UNHCR's universal standards and local reality.

In this way, this study aims to demonstrate that the UNHCR's rules and standard measurements are not neutral technical requirements, but influential spatial instruments. Understanding these standards illustrates how the physical layout of refugee camps shapes both the perception and physical reality of a permanent system of temporary living.

Key words: UNHCR | refugee camps | universal standards | digital *Emergency Handbook* | universalisation | ideal model | comparative matrix

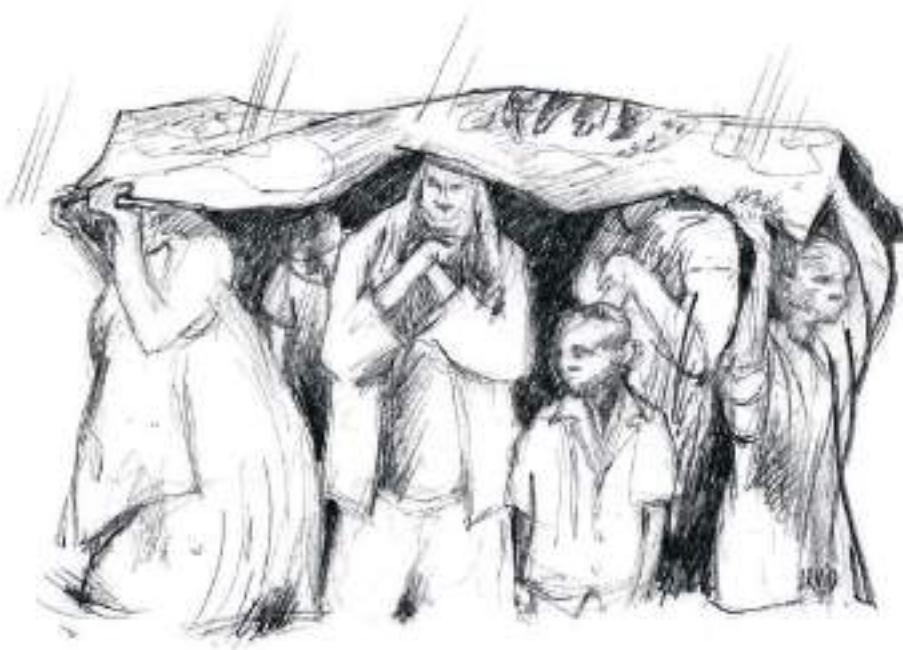


Fig. 2: Graphic illustration of refugees holding a tarp, from the chapter 'Site Selection, Planning and Shelter' in the *Handbook for Emergencies*, Second Edition (p. 132). Copyright 1999, UNHCR (United Nations High Commissioner for Refugees).

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Introduction



Fig. 3: Satellite view of Chicago, showcasing the enduring impact of the rigid grid system established by the Land Ordinance Act of 1785 on the urban landscape.
Source: Google Earth, 2024.



Fig. 4: Satellite view of Zaatari Camp in Jordan, illustrating the application of the UNHCR's rigid grid system and universal standards on the desert landscape.
Source: Google Earth, 2024.

The architecture(s) of global governance is usually associated with permanent, monumental buildings. These structures use materials like stone, marble and glass combined with an imposing scale to display power and enforce respect. However, in the world of people forced to flee their homes, a different kind of architecture has emerged: humanitarian architecture. It is not designed to be impressive or unique, but to be quick, cheap and easy to build anywhere in the world.

The United Nations High Commissioner for Refugees (UNHCR) is best known for providing aid. Over time, the organisation has also grown into a global power that affects the daily lives of millions of people. According to the UNHCR Global Appeal, the number of people forcibly displaced at the beginning of 2026 exceeded 136 million, of whom 31.8 million refugees fell under the mandate of the UNHCR.¹ Due to this enormous scale, refugee camps have become a permanent part of our global landscape. Although the work of the UNHCR is often seen as 'care', the organisation also has a hidden role: that of a global spatial authority. Using

technical Handbooks and universal standards, the organisation designs blueprints for refugee camps around the world.

This research, titled 'The Mind of the UNHCR: The Universalisation of Standards and the Emergency Handbook as the Invisible Architect of Refugee Camps', aims to investigate the processes behind the design of displacement. Although the UNHCR is mainly seen as a humanitarian aid organisation, this thesis shifts the perspective and treats the agency as a global architectural player.

The main argument of this thesis is that the standards and dimensions defined by the UNHCR are not simply neutral technical requirements, but influential spatial instruments. Even though these guidelines are presented as practical solutions for emergency aid, they function as an 'ideal model' that predetermines the physical reality of millions of people. This research demonstrates how the digitalisation of the Handbook in 2015 acted as a turning point, allowing this 'ideal model' to be universalised as a digital 'default

¹ UNHCR, "Global Appeal 2026."

script' that takes priority over the local context. This approach is aligned with the Jefferson Grid of 1785, an early example of the grid system in which a strict, mathematical layout was applied to the American West in order to divide, organise and control the area.² Similarly, the UNHCR uses its Handbook to determine a strict geometry, specifying the location of every road, tent and water source in advance.

The research is structured in two perspectives. First, we delve into 'the mind of the UNHCR' by combining a literature review with a thorough analysis of the Emergency Handbook (2015).

Next, we identify the three key pillars: shelter, context around the shelter and management which together form the organisation's 'ideal model'.

From this perspective, we examine how digitalisation reinforces the process of universalisation, turning the Handbook into a 'standard script' that enforces spatial uniformity worldwide. Second, this 'ideal model' is evaluated using three case studies: Greece, Kenya and Bangladesh. Using a comparative matrix, we investigate whether this universalisation actually leads to uniformity in these different contexts. In this phase, we also identify the specific points where the model's universal standards and local reality do not align.

Framework

State of the Art

The research regarding the United Nations High Commissioner for Refugees (UNHCR) often remains limited to its humanitarian role. However, as said in the introduction, this dissertation approaches the organisation as an architectural actor. An analysis of multidisciplinary literature is necessary to determine how the spatial role of the UNHCR has been documented and to identify research gaps.

To provide a clear overview, the literature is categorised into the two main perspectives that form the framework of the research:

- Technical perspective
- Implementation perspective

Technical perspective: the power of the UNHCR

The UNHCR's growing spatial authority is a result of its transformation from a temporary agency to a permanent global power.³ Researchers like Gil Loescher and Alexander Betts study this institutional evolution describing the organisation not as a neutral intermediary, but as a bureaucracy with a distinct culture that acts as a "teacher of refugee norms."⁴ This permanence allows the UNHCR to establish universal standards for camp management that states are expected to follow.

While their work focuses on political authority, Moulin and Nyers, and Michael Kagan build on this by defining the organisation's role as a 'surrogate state'.⁵ Their work is essential because it shows how this power is experienced in practice, as expressed by the refugees themselves: "We live in a country of the UNHCR."⁶ By illustrating that the organisation's rules not only regulate aid provision but also actively shape the spatial and daily reality of displaced

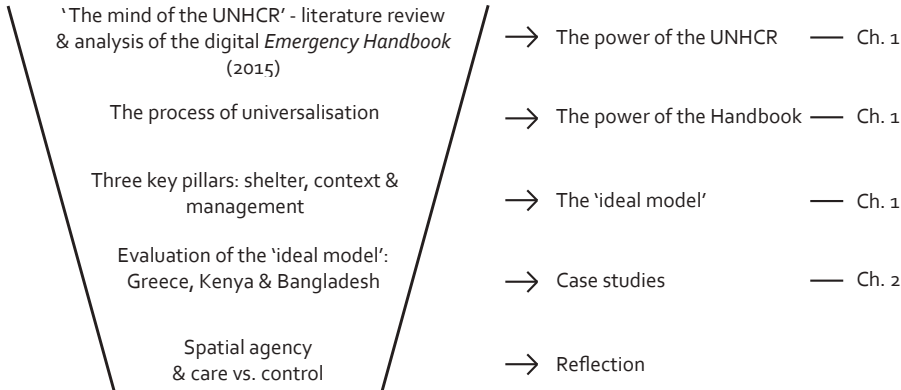


Fig. 5: Research structure overview.
Source: Author, 2026.

² Geib, "The Land Ordinance of 1785," 1-13.

³ Loescher, *The UNHCR and World Politics: A Perilous Path*, 5.

⁴ Loescher, *The UNHCR and World Politics: A Perilous Path*, 233.

⁵ Moulin and Nyers, "We Live in a Country of UNHCR," 356-372.

⁶ Kagan, "'We Live in a Country of UNHCR': The UN Surrogate State and Refugee Policy in the Middle East," 3-27.

populations, these sources justify an analysis of the organisation as the 'architect' of refugee camps.

From an architectural perspective, Barnett states that this power creates a "mix of care and control". He argues that refugee protection is no longer just about aid, but also about acting as a powerful authority that manages and controls populations through structured spatial frameworks.⁷ Here, the institution acts as a spatial operator: by defining boundaries, standard measurements and technical minimums for site planning, shelter and sanitation infrastructure. The UNHCR puts a specific structure on the landscape.⁸

While these sources clearly describe the UNHCR's history and political power, there is a research gap regarding how this power shapes the physical space of a refugee camp. Many researchers focus on the political side of the organisation, often overlooking its spatial influence on the built environment of displacement. To bridge this gap, this perspective examines the organisation's primary technical documents as the actual blueprints of displacement. The central source of this analysis is the *UNHCR Emergency Handbook*, which functions as the standardised framework for camp design, specifying everything from the

orientation of shelters to the placement of sanitary facilities. The architectural significance of these guidelines was first identified by James Kennedy (2004), who argues that every decision in a camp's layout is fundamentally an architectural choice. Kennedy warns that treating a camp as a fixed technical drawing ignores the way a settlement naturally develops through social zones and informal markets. This perspective was later updated by Manuel Herz (2013), who analysed how these blueprints evolved into a 'machine' of technical protection. Herz confirms that the fixed technical drawings Kennedy warned about have become a permanent, rigid feature of contemporary camp design.

While Kennedy and Herz based their critiques on older, printed editions, this dissertation focuses on the current digital platform and mobile app launched by the UNHCR in 2015. Unlike the static paper versions of the past, this digital tool allows for real-time updates, making standardised guidelines even more immediate in the field. By analysing this digital primary source, the research explores the UNHCR's contemporary architectural mindset and the latest evolution of its technical authority.

To better understand this architectural aspect and fill this gap, the research uses the explanation of Phoebe Goodwin. As a senior architect at the UNHCR, she provides the perspective of the 'designer'. Phoebe explains that the organisation effectively functions as a global design agency. Her research shows that the UNHCR uses master plans to design refugee camps. However, these plans prioritise technical infrastructure, such as roads for heavy trucks and water networks, over the actual social needs of the residents. By analysing her work, this thesis shows how the UNHCR uses technical tools such as the 'master plan' and the 'grid' to manage and control the physical space of camps.⁹

To delve deeper into this analysis, the thesis also studies Abu-Aridah and Henn's research on the Zaatari camp, which shows how the UNHCR's planning frameworks create a strict hierarchy of districts and blocks. This layout follows a grid in which the width of the roads is adapted to heavy trucks rather than people, and communal facilities are grouped to simplify technical maintenance. Because this fixed design ignores the reality of long-term living, residents are forced to adapt the space themselves, as Agier described, they break through the grid to create private courtyards and social clusters. This shows that while the UNHCR designs for logistics and housing, residents have to reclaim the space to make it liveable.¹⁰

⁷ Barnett, *Empire of Humanity: A History of Humanitarianism*, 221.

⁸ Barnett, *Empire of Humanity: A History of Humanitarianism*, 214.

⁹ Consortium for Sustainable Urbanization, "Humanitarian Architecture with UNHCR," 20:33 to 45:00.

¹⁰ Abu-Aridah and Henn, "Construction 4.0 in Refugee Camps," 7 - 14.

Implementation perspective:
case studies

This perspective studies the translation from theoretical guidelines to actual reality by focusing on the period between 2015 and 2026. This time span is crucial because it marks the shift from the UNHCR’s traditional printed handbooks to the digital *Emergency Handbook*. It investigates how these digitalised universal standards act as the ‘blueprints’ for contemporary refugee camps worldwide.

However, despite this wealth of data, a significant research gap remains. Most existing studies focus on the politics or sociology of these camps, while there is very little research that looks at the architectural logic.

Although maps and reports are available, there is still a lack of analysis regarding how the UNHCR’s digital ‘blueprints’ actually shape the physical space.

To explore this, this research uses a global comparison approach. By looking at three different case studies, the thesis examines the universal reach of the UNHCR’s technical requirements:

- Kara Tepe 2 in Europe (Greece)
- Kalobeyei in Africa (Kenya)
- Kutupalong in Asia (Bangladesh)

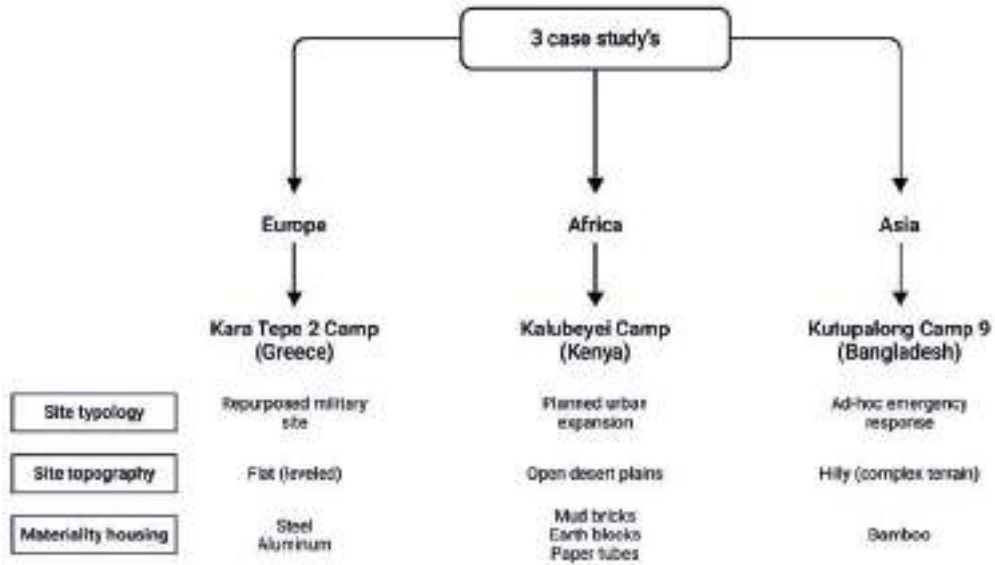


Fig. 6: Schematic overview of the chosen case studies and their architectural differences.
Source: Author, 2026.

Research Questions

The master’s thesis focuses on the following research questions:

Historical:

What is the genealogy of the *UNHCR Emergency Handbook’s* spatial standards?

Spatial:

How do the standards of the *UNHCR Emergency Handbook* function as influential spatial instruments that enforce a universal ‘default script’ over local physical realities?

Application:

How does the universalisation of the ‘ideal model’ function as a strict blueprint when confronted with the diverse architectural realities of Kara Tepe 2, Kalobeyei and Kutupalong?

Universalisation:

How has the transition to a digital Handbook since 2015 enforced the universalisation of the UNHCR’s ‘ideal model’?

Methodology

To fill the research gap, I used a method known as triangulation.¹¹ This involves approaching the challenge from three different angles, which follow one another in a cyclical process: the blueprint, the application and the reality.

The research starts with the technical perspective, focusing on the blueprint. To understand the *UNHCR Emergency Handbook*, I thoroughly studied the digital platform and the mobile app. However, to understand the 'logic' beyond the screen, the research went a step further by conducting interviews with experts. These primary sources provided insights into the UNHCR's internal decision-making processes and details that are not included in public reports. A key part of this phase was creating the comparative matrix. This tool was developed by extracting information and rules directly from the UNHCR's app such as density, circulation and zoning. These standards were then organised into clear structural categories to form the matrix. The matrix represents the UNHCR's 'ideal model'. This approach makes the spatial influence of the UNHCR visible and easy to measure.

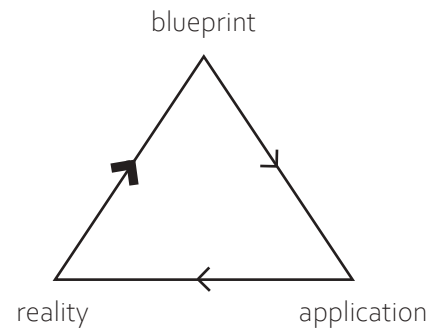


Fig. 7: Schematic representation of the triangulation.
Source: Author, 2026.

Next is the implementation perspective, focusing on the application. This part of the research was the most difficult because there is almost no information available on how these rules are actually applied on the ground. To solve this, a detailed spatial study has been carried out on three case studies: Kutupalong (Bangladesh), Kalobeyei (Kenya) and Kara Tepe 2 (Greece). Using satellite imagery and field reports, these camps were evaluated according to the comparative matrix. Given that the UNHCR strives for universal standards, the 'ideal model' should, in theory, ensure that every camp looks the same.

The matrix was used to test whether this uniformity actually exists or whether the digital 'default script' ignores the local landscape. As the interviewees had not worked at these specific locations, independent architectural analysis was required to see how the app's blueprint limits the designer's freedom.

The study concludes with a final reflection, which focuses on the reality. In this final step, the technical findings from the case studies were combined with the stories and information from the interviews and secondary literature. This made it possible to analyse the gap between the strict standards of the matrix and the practical experiences of the people

living in the camps. By comparing these different sources, the tension between 'care' and 'control' was researched.

This process forms a vicious circle. The reason the arrow from reality points back to the blueprint is that feedback from the field often only reinforces the original model. Instead of adapting the rules when they do not align with local reality, reality is often forced to adapt to the rules. This creates a vicious circle in which the 'ideal model' is constantly reinforced and reused, even if it does not function perfectly in practice. By tracing this cycle the research can clearly reveal how the UNHCR's digital tools maintain their power over the space of the refugee camp.

¹¹ Carter et al. "The use of triangulation in qualitative research."

Data Management

This research follows the KU Leuven Research Data Management (RDM) policy (approved February 2025) to ensure research integrity and the FAIR data principles.

The information collected for this research includes qualitative interviews with experts, digital criteria from the *UNHCR Emergency Handbook* app and spatial reports from the case studies. In addition, various secondary sources were consulted, such as academic literature, NGO reports and existing policy documents. To ensure that the data is easy to understand, all files are provided with clear documentation (metadata). To ensure privacy and comply with GDPR rules, all interview data is strictly anonymised. The names of interviewees are replaced by codes

(e.g., 'expert A') to protect their privacy and all participants have given their consent. The interview notes are kept confidential to protect the privacy of the participants and will not be shared publicly or included in the final thesis. During the research, all data is stored and backed up via the secure KU Leuven OneDrive linked to the institutional account. For transparency and potential reuse, all secondary sources and research data have been organised in a Google Drive folder. Access to this folder can be granted on request via a shared link to interested students and researchers. Following KU Leuven Principle V, all research data and documents will be kept for at least 10 years after publication for verification and reuse.

Statement on AI

I did use the generative AI assistance tool Gemini (Google) during the research and writing process of this thesis in the following ways:

Gemini was used as a search engine to learn about a particular topic.

Specifically, I used the tool to navigate through a large number of collected sources, such as older editions of the UNHCR Handbook and NGO reports. It allowed me to efficiently identify specific technical details and criteria, which were then manually checked for accuracy and relevance.

Gemini was used for short-form input assistance.

I used the tool to ask for feedback on the logical structure of my text and to rewrite certain passages, with the aim of improving the overall clarity and readability of the research.

Gemini was used to generate visuals.

I used the tool to process and enhance my original research photographs. Specifically, the tool was used to improve the visual quality of these images and to convert them to grayscale. This was done to ensure a professional appearance and to align the visual documentation with the minimalist and uniform style of the thesis layout.

The text / images in this thesis are my own (unless otherwise specified) and generative AI has only been used in accordance with the KU Leuven guidelines and appropriate references have been added. I have reviewed and edited the content as needed and I take full responsibility for the content of the thesis.

Chapter I: Technical Perspective

1. The Mind of the UNHCR: The 'Ideal Model'

In this first part, the theoretical and technical foundations of the UNHCR are analysed. While the introduction described the organisation as a global power, this part focuses on the specific instruments through which that power is exercised. The analysis focuses on the internal logic of the organisation, in this study defined as the 'mind of the UNHCR'.

The goal is to reveal how abstract humanitarian principles are translated into a tangible, physical reality through standardisation. At the core of this is the UNHCR's *Emergency Handbook*, which serves not only as a guide, but as a strict blueprint for the design of the living environment of displacement.

1.1 The Power of the UNHCR

To understand how refugee camps are designed, we must first look at the authority of the organisation itself. In the UNHCR's *Emergency Handbook*, the organisation describes its mandate as "entirely non-political and strictly humanitarian".¹² This gives the impression that the UNHCR takes only neutral, technical decisions. In reality, this neutral position is the reason why they have so much influence over the built environment. It is precisely by claiming that its decisions are purely technical that the organisation gains the freedom to set up camps without national governments standing in its way.¹³

This allows the UNHCR to function as a global spatial authority whose design agency is depersonalised: the power to shape space does not lie with an individual designer but is hidden behind a complex bureaucratic system of norms and standards. In practice, this means that the *UNHCR Emergency Handbook* itself takes on the role of architect. Rather than a person making site-specific decisions, the Handbook defines the spatial layout by translating design logic into a set of standardised guidelines.

Protection	Emergency Assistance	Coordination and Communication	Support the Response	Staff in Emergencies												
2. Space allocation The size of a settlement and area per capita is critical as crowded conditions lead to increased morbidity and stress, also complicating service delivery. The provision of adequate space, both outside and inside shelters and for basic services, is an essential requirement. The average area per person (sqm/m²) indicator measures the average living space to which a person has access in a settlement. This space should accommodate all services while promoting dignified living conditions. • 45 sqm per person is the recommended standard • 30 sqm per person is necessary for shelter plots, roads, foot paths, educational facilities, sanitation, firebreaks, water storage, distribution points, markets, storage for relief items and administration and security. It excludes any land for significant agricultural activities or livestock. • 15 sqm per person is allocated to household gardens attached to the family plot which should be included in the size plan from the outset. • Going below the minimum standard (e.g. less than 20 sqm/person) is strongly discouraged. Although it may have to be considered for specific situations (e.g. when certain services are already present in transit centres where household gardens are not required; very specific topographies that may limit meeting the minimum standard etc.). • Take into account the necessity of accommodating future expansion, including for the natural demographic growth (average of 3-4% per year). <table><tr><th>Population size</th><th>Minimum settlement area (sqm)</th><th>Minimum settlement area (hectares)</th></tr><tr><td>5,000 persons</td><td>225,000</td><td>22.5</td></tr><tr><td>10,000 persons</td><td>450,000</td><td>45</td></tr><tr><td>20,000 persons</td><td>900,000</td><td>90</td></tr></table>				Population size	Minimum settlement area (sqm)	Minimum settlement area (hectares)	5,000 persons	225,000	22.5	10,000 persons	450,000	45	20,000 persons	900,000	90	In this section: 1. Overview 2. Reference for emergency operations 3. Main guidance 4. Standards 5. Links 6. Main contacts
Population size	Minimum settlement area (sqm)	Minimum settlement area (hectares)														
5,000 persons	225,000	22.5														
10,000 persons	450,000	45														
20,000 persons	900,000	90														
3. Emergency standard for planning settlements The plan should include natural features and contain topographical information outlining the physical features of the landscape (rivers, valleys, mountains) and general parametric information describing locations and facilities in the settlement. The plan should ideally have a metric scale between 1:10,000 and 1:5,000. <table><tr><th>Description</th><th>Minimum Standard</th></tr><tr><td>Covered living area</td><td>3.5 sqm per person minimum</td></tr><tr><td></td><td>In cold climates and urban areas 4.5 sqm, to 5.5 sqm.</td></tr></table> See Emergency Shelter Standards entry for more guidance.					Description	Minimum Standard	Covered living area	3.5 sqm per person minimum		In cold climates and urban areas 4.5 sqm, to 5.5 sqm.						
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Covered living area	3.5 sqm per person minimum															
	In cold climates and urban areas 4.5 sqm, to 5.5 sqm.															

Fig. 9: The *UNHCR Emergency Handbook* app translates technical standards into a physical camp layout, proving that the Handbook dictates the built environment instead of a human designer. Source: Author, 2026; content based on the digital *UNHCR Emergency Handbook*.

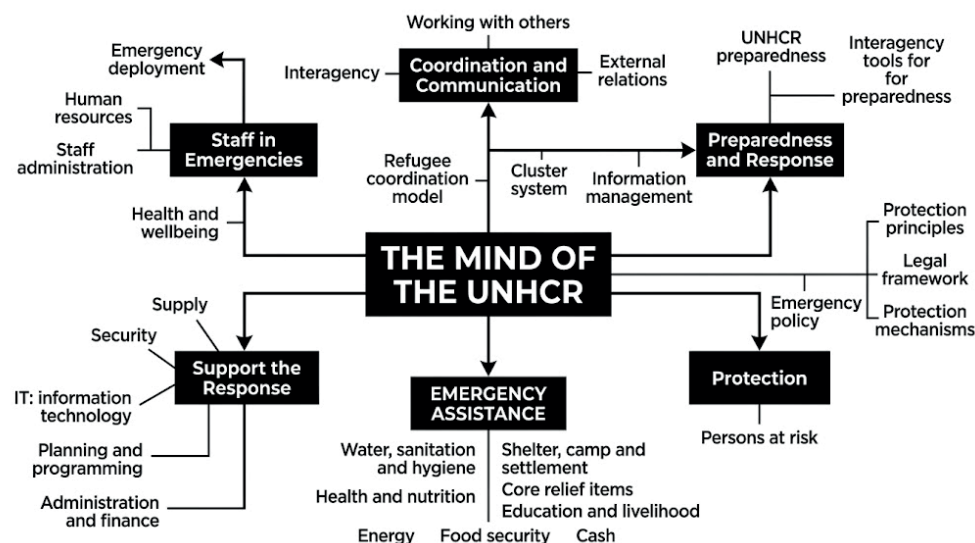


Fig. 8: Mindmap of 'the mind of the UNHCR' based on the six main categories and their subcategories from the *Emergency Handbook*'s digital application. Source: Author, 2026.

¹² UNHCR, *UNHCR Emergency Handbook*, 20.

¹³ Loescher, *The UNHCR and World Politics: A Perilous Path*, 145.

¹⁴ Loescher, *The UNHCR and World Politics: A Perilous Path*, 233.

standards worldwide, the organisation reinforces its status as the only authority with the power to define these standards.

However, this 'apolitical' character is exactly what allows the UNHCR to expand its influence into what Michael Barnett describes as a form of global governance. They do not limit themselves to providing humanitarian aid such as food or blankets, they organise and manage the entire daily lives of millions of people. In this study, it is described as a 'permanent system of temporary housing'. This form transforms the UNHCR into a 'surrogate state'. As Michael Kagan argues, this involves "a de facto transfer of responsibility for managing refugee policy from sovereign states to United

Nations agencies."¹⁵ According to this definition, the UNHCR no longer acts as just a supporting humanitarian organisation, but also takes over the sovereign responsibilities of a national government. This means that the organisation is fully responsible for managing refugee camps, registering asylum seekers and providing essential public services such as education, healthcare and security. This is experienced in practice by the refugees themselves, as noted by Moulin and Nyers: "We live in a country of the UNHCR."¹⁶

To understand how this architectural power is exercised in practice, we must focus on the organisation's primary instrument: the *UNHCR Emergency Handbook*.

1.2 The Power of the Handbook: A Spatial Instrument for Universalisation

As introduced in the previous part, the primary spatial instrument of displacement is the *UNHCR Emergency Handbook* itself. In the organisation's official documentation and secondary sources, the *Emergency Handbook* is presented as a 'reference tool'.¹⁷ The organisation describes their Handbook as a practical aid for field workers to ensure the quality of humanitarian aid. However, a critical analysis reveals that this Handbook is in fact a powerful instrument that shapes the physical reality of millions of people through strict standards.

By creating technical standards, the UNHCR builds a universal framework. Although the Handbook is presented as a guidance document, governments, NGOs and urban planners rely on these standards to support their spatial planning decisions. The universal influence of this document is not purely a side effect of the provision of aid, instead it is the result of a strategic institutional approach to translate the UNHCR's political mandate into a framework of technical standards that dictate spatial reality. Through this Handbook, the UNHCR ensures that

spatial planning remains within the organisation's realm, a position it secured during a serious crisis of legitimacy.

The *Emergency Handbook* is the result of a major institutional crisis and a historical shift that has occurred over a period of thirty years. Between its establishment in 1950 and the late 1960s, the UNHCR operated from a rather limited, Eurocentric perspective and acted primarily as a temporary legal and political mediator. At that time, the agency's primary objective was to provide 'international protection' to refugees. The focus was on ensuring that states respected the principle of non-refoulement and on providing legal status and travel documents to refugees. As Gil Loescher explains, this principle prevents any country from returning a person to a place where they face a real risk of persecution or harm. In practice, this meant that the UNHCR's role was primarily to ensure that asylum seekers remained protected from deportation until their asylum claims had been properly examined. During that period, the organisation maintained a strictly non-operational position, acting as

¹⁵ Kagan, "'We Live in a Country of UNHCR': The UN Surrogate State and Refugee Policy in the Middle East," 3.

¹⁶ Kagan, "'We Live in a Country of UNHCR': The UN Surrogate State and Refugee Policy in the Middle East," 3-27.

¹⁷ UNHCR, *UNHCR Handbook for Emergencies*, 3rd ed., 12.

a neutral intermediary supervising the implementation of international treaties, rather than constructing physical infrastructure or managing camps.¹⁸

However, as Gil Loescher explains, the 1970s led to an intense crisis of legitimacy as displacement patterns shifted towards the South, where legal intervention alone was insufficient to respond to the massive influx of people who needed immediate assistance to survive.¹⁹ This shift is clearly visible in the statistical data from that period, the data on African refugees (fig. 10) show a dramatic turning point from 1970 onwards, with the number of refugees rising explosively between 1970 and 1980 from less than 1 million to nearly 4 million.²⁰ At the same time, migration figures for South America (fig. 11) also show a clear upward trend that began precisely in 1970, with an increase of 5 million migrants recorded by 1980.²¹ Faced with the need to prove its relevance in a world of state-centred politics, the UNHCR had to reinvent itself and make the transition from a distant legal agency to a permanent, global operational force. The publication of the

first *Emergency Handbook* in 1982 was the strategic instrument for this transformation and served three primary purposes:

Firstly, it provided an opportunity for a significant operational expansion. This represented a fundamental change in the UNHCR's scope. The organisation transformed from a distant authority into an active operational force on the ground. From then on, it became directly involved in the practical organisation, logistics and spatial design of refugee camps.

Secondly, the Handbook functioned as a technocratic shield. By presenting the design of refugee camps as a scientific, standardised process, the UNHCR could demonstrate its expertise to sceptical donor countries and transform the chaos of displacement into a well-organised and fundable sector.

Thirdly, it enabled a form of spatial diplomacy. By creating a monopoly on technical expertise, the UNHCR used its own Handbook as the only international standard to overrule local authorities, keeping spatial planning under the organisation's strict control.

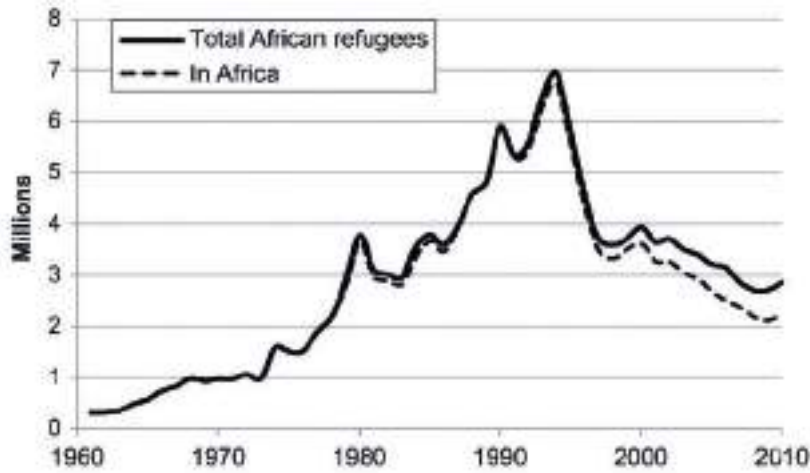


Fig. 10: Total number of African refugees, 1961–2010. Source: UNHCR Statistical Online Population Database.

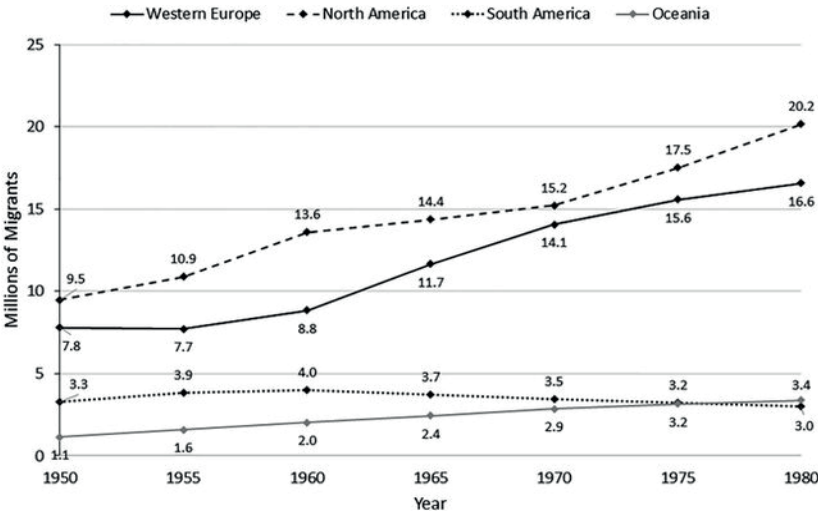


Fig. 11: Total number of international migrants in four regions of the world, 1950–1980. Source: UN Population Division, compiled by Douglas S. Massey.

¹⁸ Loescher, *The UNHCR and World Politics: A Perilous Path*, 145–233.
¹⁹ Loescher, *The UNHCR and World Politics: A Perilous Path*, 11.
²⁰ Robert E.B., *Handbook of the Economics of International Migration* Chapter 26, 1145–1596.
²¹ Massey, "The Shape of Things to Come," 36.



Fig. 12: Timeline of the evolution of the UNHCR Emergency Handbook.
Source: Author, 2026.



Fig. 13 + 14 + 15 + 16: All four editions of the UNHCR Emergency Handbook.

Since the publication of the first edition in 1982, several new editions were created. The second (2000), third (2007) and fourth (2015) versions were published to cope with the increasingly complex and dangerous nature of contemporary humanitarian crises.²² These revisions allowed UNHCR to integrate insights gained by staff working in the field and NGO partners, to address new challenges such as security awareness, sexual and gender-based violence (SGBV) and HIV/AIDS. By documenting these complex social and protection risks in technical standards, UNHCR was able to bring every new aspect of displacement under its institutional control.

Furthermore, the transition to a digital platform in 2015 has transformed the

nature of this authority. Whilst the physical Handbook remains a static document, the digital version suggests a state of constant updating, accessibility and universal applicability. It functions as a standard script that is accessible worldwide, filling the gap between the head quarters in Geneva and the local situations on the ground via a single screen displaying standardised information.

This digitalisation marks the main argument of the thesis: by evolving from a 'reference tool' into a dominant spatial instrument, this digital evolution drives a process of universalisation. Because the Handbook has become a standard script that is instantly accessible on smartphones, it has created a new level of global spatial uniformity. As

technical standards are no longer just a set of guidelines but direct digital requirements, the diversity of local architectural solutions is being reduced.

This technocratic approach is reflected in the UNHCR's 'master plan', an instrument based on the belief that human needs are universal and identical across the globe and therefore require a 'neutral', standardised planning method. In this framework, the individual refugee family or tent serves as the smallest, basic unit of a strictly hierarchical 'modular planning' system. The Handbook dictates how these units must be mechanically upgraded: sixteen tents form a cluster, sixteen clusters a block and four blocks a sector. This process results in the creation of a complete camp which, in its 'ideal' form, accommodates exactly 20.000 refugees.²³

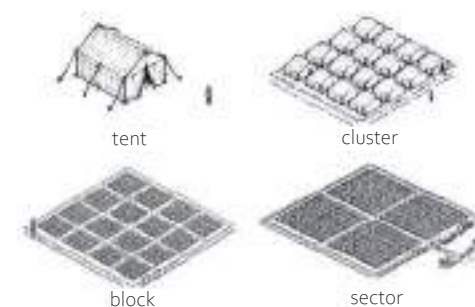


Fig. 17: Modular planning system of the UNHCR.
Source: Author, 2026.

This urge for uniformity becomes problematic as soon as the UNHCR starts interfering in the smallest details of daily life. It is logical to say that every refugee worldwide has a right to shelter, but it is unreasonable to claim that the same universal logic also applies to the layout of a person's living space or their daily routine. As Kennedy argues, the Handbook is based on an 'assumption of universal applicability', even when the focus shifts from general human rights to obsessive regulation of every individual aspect of aid provision.³⁸ This results in a system in which everything is regulated down to the last detail. The UNHCR prevents any discussion by presenting standards as pure data: lists of numbers without any justification or human context. The result is an inflexible structure in which the authority of the data is more important than the specific needs of the place itself, the Handbook specifies exactly how many pieces of chalk a teacher in a camp must receive (6 boxes, totalling exactly 144 pieces), or the precise number of footballs per 1000 people.²⁴ Through this strict and mathematical structure, the camp's architecture is transformed into a purely quantitative system. Here, the UNHCR does not design a living environment that responds to its context, but manages a human

²² UNHCR, *UNHCR Handbook for Emergencies*, 2nd ed., 8.

²³ Herz, "Refugee Camps in Chad," 4.

²⁴ Kennedy, "Towards A Rationalisation of the Construction of Refugee Camps," 19.

inventory through a universal grid that can be laid over any landscape through a digital screen.

This is further reinforced by the way in which UNHCR staff are trained and expected to work, as site planner Phoebe Goodwin explained during the interview, the similarity between different camps can be explained by the fact that staff are all trained to the same standards and are expected to apply them uniformly worldwide.

However, the influence of the Handbook extends far beyond UNHCR alone. As Kennedy points out, whilst major humanitarian organisations such as Médecins Sans Frontières (MSF) and the ICRC do have their own guidelines, they base their standards for camp design and construction on the *UNHCR Handbook*. This means that the document is no longer just an internal 'reference tool', but serves as the universal standard for the entire humanitarian sector. Kennedy also

argues that any proposal for camp construction must now take into account the standards of the Handbook, even if it is only to criticise them or explore alternatives. This confirms the Handbook's status as an irreplaceable source of power: the Handbook has become so dominant that people can no longer even imagine how a refugee camp might be built in any other way.²⁵

To understand how this universalisation is implemented in practice, it is necessary to look beyond the institutional logic and analyse the technical blueprints themselves. The UNHCR's digital authority is not purely abstract, it finds its physical expression in a standardised spatial script that the UNHCR uses to shape the environment of displacement. In the following section, we will break down this 'ideal model' by examining the specific technical requirements and guidelines that ensure that every camp, regardless of its geographical or cultural context, follows the same universal logic.

1.3 The Genealogy of Standards

Before diving into the current UNHCR standards, it's essential to ask why such standards exist in the first place. A 'standard' is a technical document developed through experts in the field and approved by a regulatory authority. Traditionally, standards were created to ensure quality, safety and uniformity in production and construction.²⁶

The use of technical standards is not a contemporary invention. Already in the 4th century BC, the Eleusis Inscription established strict standards for bronze building materials in ancient Greece. Inscribed on a stone stele, it specified that the bronze used for the column dowels of the Portico of Philo had to consist of precisely eleven parts copper and one part of tin. The components also had to be shaped on a lathe according to an official reference model kept at the site. The inscription also named the contractor responsible for the work and a guarantor who would ensure compliance. These standards were not vague guidelines, but binding, measurable and enforceable requirements. In other words, they functioned exactly as a modern technical standard would. These guidelines were meant to prevent fraud and ensure that all building components

were identical and safe. This shows that standards have always been a tool for governments to check the technical quality of a project.²⁷

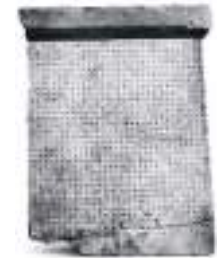


Fig. 18: The Eleusis Inscription (4th century BC). An early example of technical standardisation, in which strict rules for the composition of metals were defined to prevent fraud.

Source: Georgios Varoufakis

Centuries later, this same logic of standardisation - uniformity, control and the prevention of fraud - reappeared in a very different context. When tracing the history of modern humanitarian aid, it becomes clear that the standards outlined in the first *UNHCR Emergency Handbook* from 1982 did not emerge from architectural principles, but from three specific historical sources.

The first source is military logistics. The spatial layout of refugee camps - rectangular grids, divided into sectors and blocks, with centralised facilities and controlled access routes - reflects a tradition of spatial control with deeply rooted historical foundations. The Roman army applied this logic on a large scale: every Roman military

²⁵ Kennedy, "Towards A Rationalisation of the Construction of Refugee Camps," 16.

²⁶ Anastasopoulos, "The first standard: Looking back at the dawn of conformity assessment."

²⁷ EDU4Standards, "History of Standardisation."

camp followed a standardised layout, with the headquarters (principia), the commander's quarters (praetorium), the hospital (valetudinarium) and the grain stores (horrea) always positioned in a fixed and recognisable location. As Goldsworthy describes, almost all forts had the classic rectangular shape, with two central roads - the via principalis and the via praetoria - dividing the internal space.²⁸

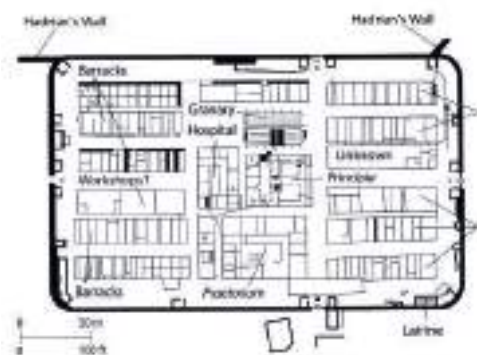


Fig. 19: Plan of the Roman auxiliary fort at Housesteads on Hadrian's Wall, showing the standardised layout of the granary (horrea), hospital (valetudinarium), headquarters (principia) and commander's house (praetorium).

Source: Adrian Goldsworthy

A soldier being transferred from one end of the empire to the other would immediately recognise where everything was located. This standardisation of living space designed for control, efficiency and rapid deployment did not disappear with the Roman Empire. It was refined and formalised through centuries of military

practice. It is specifically this logic - the efficiency of screening, counting and managing large groups of people through administratively controlled spatial layouts - that reappears as the spatial principle at the heart of the 1982 *UNHCR Emergency Handbook*.

The second source is 19th-century hygiene science, also known as sanitary engineering. This field of study developed in response to the epidemic diseases that spread through densely populated, enclosed communities during the Industrial Revolution: cholera, typhus and fever plagued military barracks and urban slums. As Edwin Chadwick documented in the case of a Glasgow workers' building known as 'the Barracks', where overcrowding and poor ventilation created conditions in which diseases could spread undisturbed.²⁹ Chadwick argued that diseases could be controlled through improved living conditions, ventilation and sanitation, and that "efficient drainage, sewerage and cleansing of towns come within the acknowledged province of the legislature".³⁰ Minimum floor space per person, distances between latrines and requirements for drainage became the tools of public health policy. These standards were not

based on studies of human well-being or comfort, they were the minimum standards that would prevent mortality rates from becoming unacceptably high. It is from this tradition that the standard for refugee camps of 3,5 m² of covered living space per person most likely originates: a survival standard, not a standard for a decent life.

The final source is direct experience in the field. As the UNHCR explains, in the 1970s best practices for emergency response were shared across the organisation through the exchange of handwritten notes: documents on shelter, WASH (water, sanitation and hygiene) and protection that were passed from one emergency to another around the world. During the major refugee crises in Thailand and Bangladesh in that decade, aid workers had to improvise solutions under extreme time pressure and with minimal resources. The handwritten sketches circulating between field staff - showing the layout of the camps, the location of water points and the distances between latrines - were not the result of planning committees or research institutes. Instead, they were responses to urgent crises. In 1982, these documents arrived at UNHCR's headquarters in Geneva and were collected in the first printed edition of the *Emergency Handbook*.³¹

³¹ UNHCR, "Emergency preparedness."

³² Kennedy, "Towards A Rationalisation of the Construction of Refugee Camps," 29.

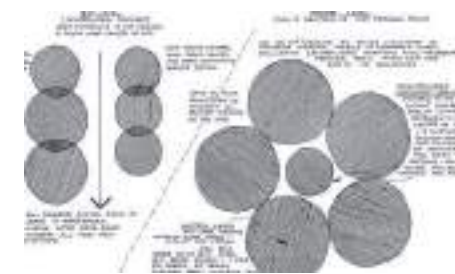


Fig. 20: A handwritten note that was shared within the organisation during refugee crises, showing the spatial layout of a refugee camp divided into site, sector and section level, with decentralised community services and the minimum floor space standard of 3,5m² per person already visible.

Source: UNHCR



Fig. 21: A handwritten note that was shared within the organisation during refugee crises, showing a scene from everyday life in a refugee camp.

Source: UNHCR

This background has a crucial and often overlooked significance: the specific standards in the 1982 Handbook are not the result of thorough scientific research. Kennedy shows that an analysis of the available literature reveals no evidence of any study having been published that verifies the standards in the Handbook using strict scientific research methods. No controlled experiments were performed, no basic comparisons were ever made between different spatial layouts.³² Kennedy further notes that

²⁸ Goldsworthy, "The Complete Roman Army," 82-89.

²⁹ Chadwick, "Report on the Sanitary Condition of the Labouring Population and on the Means of its Improvement", 58.

³⁰ Chadwick, "Report on the Sanitary Condition of the Labouring Population and on the Means of its Improvement", 157.

the minimum of 3,5 m² per person is barely distinguishable from the 3 m² that the Handbook itself describes as the minimum for transit camps that are spaces considered temporarily acceptable for three to five days, but not for the long term.³³ The standard that defined the living conditions of millions of refugees was basically a survival minimum based on improvised practical experience, rather than a measurement based on evidence of what is considered acceptable living conditions for humans. By making these temporary solutions

official, the camp became a system that operates in two ways simultaneously: it uses a military logic to control people and a humanitarian logic to take care of them. This dual logic confirms anthropologist Michel Agier’s argument that refugee camps function as a ‘space of exception’ where humanitarian care and police control are intertwined. The camp is a constructed space rooted simultaneously in a military logic of imprisonment and classification, and in a humanitarian logic of protection and care.³⁴

1.4 Defining the Three Pillars of the ‘Ideal Model’

The UNHCR’s ‘ideal model’ is analysed in this study based on the most recent, digital version of the *Emergency Handbook*. By analysing this digital platform, three main pillars of standardisation can be identified: the shelter, the context around the shelter and management of the camp.

These three pillars are not independent components, they are intertwined and form the physical environment of

refugees, representing the institutional requirements of the UNHCR in tangible form. Within this system, every decision regarding the tent and the spatial layout of the context around the tent is strategically designed to enable efficient management. Together, they form the ‘standard script’ that ensures a camp, wherever in the world, is built according to the same institutional DNA.

Pillar	Standards
Shelter	• 3,5m²/person in warm climates (min. shelter area) • min. 2m height at the lowest point in warm climates • 4,5m² to 5,5m²/person in cold climates (min. shelter area) • max. 2m height in cold climates • 5 persons/unit • lockable doors/access • internal partitioning • use of appropriate shelter materials • socio-economic space for assets and livelihoods • modular planning
Context around the shelter	• 45m²/person (total area: shelter + context) • hierarchical layout • logistical zones • plot ratio 1:2 to 1:5 • 30m firebreaks every 300m • max. 50m distance to nearest cluster neighbour • min. 2m between shelters • infrastructure must follow topography
Management	• open access of public routes • grid-infrastructure alignment • max. 20000 persons/settlement unit • 45m² total land area/person • max. 500m to water point • max. 5km to clinics • road safety management

Fig. 22: The ‘ideal model’ of the UNHCR: the standards for the three pillars of displacement. Source: Author, based on the *UNHCR Emergency Handbook* (2015).

³³ Kennedy, “Towards A Rationalisation of the Construction of Refugee Camps,” 32.
³⁴ Agier, *Managing the Undesirables*, 80-81.

1.4.1 Shelter

The first pillar focuses on the most intimate, smallest scale of the camp: the shelter. It is the space in which refugees sleep, eat, care for their children and store their belongings. Thus the most important space in the design, as refugees spend the vast majority of their time here. Although it is central to refugees' daily lives, the UNHCR defines the living space primarily through a set of quantitative minimum standards. These standards do not describe a home, but they describe the minimum requirements for survival. To understand the 'shelter' pillar, each standard should therefore not be seen as a design ambition, but as a survival requirement.

The standard of 3,5 m² of covered living space per person in warm climates is the most criticised and controversial standard in the entire Handbook. As the history of standards shows (see 1.3), this standard is not based on scientific research on suitable living conditions for humans. Kennedy argues that it is practically indistinguishable from the 3 m² standard applied to transit camps but unfeasible for long-term residence. The standard applied to the

permanent living conditions of millions of refugees only differs by 0,5 m² from the emergency minimum.³⁵

To make this standard tangible: 3,5 m² is about the size of a wheelchair-accessible public toilet, the legal minimum under Belgian building regulations (165 cm x 220 cm).³⁶ For comparison, the European Committee for the Prevention of Torture (CPT) recommends a minimum of 6 m² for a single-occupancy prison cell³⁷ and Belgian animal welfare legislation requires 7 m² for a large dog (>75 cm).³⁸ A convicted prisoner and large dogs are both technically granted more space than refugees.

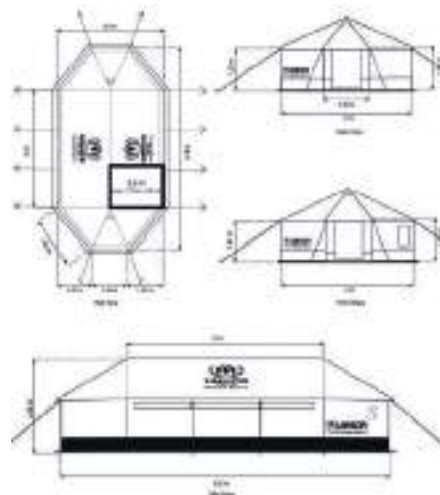


Fig. 23: Technical drawing of the standard UNHCR family tent, showing the total footprint of 4m x 6.6m with the 3,5m² minimum living space per person indicated. The tent is designed for five persons. Source: UNHCR

The standard applies specifically to warm climates and excludes cooking facilities or kitchen areas. The reason given in the Handbook is that in warm climates certain activities, such as cooking, are expected to take place outside. This assumption is culture-specific and context-dependent: it is based not only on climatic conditions, but also on social habits, safety conditions and the availability of outdoor space.³⁹

The Handbook does acknowledge that the standard is an absolute minimum and encourages its modification in more developed contexts where residents have an income. However, the logic of the digital platform and its universal application mean that, in practice, the minimum is considered the standard. The critical gap between the technically acceptable minimum and the desired minimum is closed by the logic of universal standardisation.

In cold climates, the standard is increased to between 4,5 m² and 5,5 m² per person, because refugees spend more time indoors during the cold seasons, activities such as cooking and studying take place inside and more storage space is needed for winter clothing and equipment.⁴⁰ The use of a range rather than a fixed number allows

for a degree of contextual flexibility that is uncommon in the Handbook's otherwise strict rules. This also causes some confusion, however, as no clear guidelines are provided to identify which limit of the range should be used in a particular context.

As Agier argues, humanitarian care and control in refugee camps are inseparable⁴¹, the system that provides shelter also determines where people live and how close they are to one another. The 3,5 m² standard is the most direct expression of this duality: this standard defines both the minimum space the humanitarian system is prepared to provide and the spatial density that makes the camp administratively manageable.

The standard of five people per shelter unit is one of the most radical and least controversial standards in the Handbook. It defines the camp's basic organisational structure, namely the family as containing exactly five people. This number is not based on demographic data on the composition of refugee households, it is a design assumption that defines the entire spatial hierarchy of the modular layout. Sixteen shelter units, with five people each form a cluster of eighty people, sixteen clusters form a block of 1280,

³⁵ Kennedy, "Towards A Rationalisation of the Construction of Refugee Camps," 32-33.

³⁶ Vlaanderen, "Toegankelijk publiek sanitair."

³⁷ COE, "CPT Standards," 1.

³⁸ EMIS Navigator, "Koninklijk Besluit van 27 april 2007 houdende erkenningsvoorwaarden voor inrichtingen voor dieren en de voorwaarden inzake de verhandeling van dieren," 1.

³⁹ UNHCR, "UNHCR Emergency Handbook: Emergency Shelter Solutions and Standards."

⁴⁰ UNHCR, "UNHCR Emergency Handbook: Emergency Shelter Solutions and Standards."

⁴¹ Agier, *Managing the Undesirables*, 4.

four blocks form a sector of 5120 and a full camp provides space for 20.000 people divided into four sectors (see fig. 17).⁴²

Module	Structure	Approximate number
Family	1 x family	4 - 5 persons
Community	16 x families	60 persons
Block	16 x communities	1.250 persons
Sector	4 x blocks	5.000 persons
Settlement	4 x sectors	20.000 persons (max)

Fig. 24: Standard modular planning units
Source: Digital UNHCR Emergency Handbook

The standard five-person household thus serves both as the foundation on which the entire modular planning system is built and as the point at which the system’s most fundamental weakness becomes visible. By assuming that every household consists of exactly five persons, the Handbook guarantees that larger families, which are the norm in many refugee contexts, will be systematically forced to live in a space that does not meet the minimum standards.

Although the *UNHCR Emergency Handbook* does not prescribe a specific construction material, plastic sheeting has become by far the most widely used shelter material in UNHCR camps worldwide, so dominant that it functions

in practice as the default standard. The blue and white sheeting with the UNHCR logo has become an iconic symbol of humanitarian displacement. The use of this material represents a specific list of priorities: cheap, lightweight, easy to transport, quick to set up and does not require expert skills to assemble.⁴³ It is the physical representation of the core values of the Handbook: speed, uniformity and adaptability.



Fig. 25: Rows of identical UNHCR family tents in La Guajira camp, Colombia. The visual uniformity is a direct consequence of the plastic sheeting standard.
Source: Bloomberg, taken by Federico Rios.

However, the use of plastic sheeting also has well-known limitations. It provides minimal thermal insulation, in warm climates the material becomes burning hot and in cold climates dangerously cold.⁴⁴ The material is also not fire-resistant, even highly flammable. This last limitation was proven with catastrophic consequences in March 2021 at Kutupalong Camp 9 in Bangladesh - one of the three case studies examined in chapter II of this

thesis - where a fire spread rapidly through a densely populated area of bamboo shelters covered with plastic sheeting, destroying thousands of homes within a matter of hours.

The final shelter standard that requires analysis is the modular planning of shelters into standardised clusters, blocks and sectors that together form a fixed spatial layout. This modular approach is the spatial translation of the Handbook’s central logic: the camp as a replicable and universally adaptable spatial design that can be implemented anywhere in the world by any trained field worker.

The operational advantages of modular planning are obvious. It allows camps to be designed without the need for specialist architectural expertise. It also ensures that facilities are positioned at predictable distances from one another. It creates a spatial layout that is clearly visible from above, which makes aerial surveillance and operational management easier. Furthermore, it ensures uniformity: a camp in Chad follows the same spatial logic as a camp in Syria, meaning that staff, supplies and institutional knowledge can be deployed across different contexts without the need for local adaptations.



Fig. 26: Modular planning in Chad, Africa.
Source: UNHCR



Fig. 27: Modular planning in Syria.
Source: Belga News Agency, photo Omar Haj Kadour.

⁴² UNHCR, “UNHCR Emergency Handbook: Emergency Shelter Solutions and Standards.”
⁴³ UNHCR, “Plastic Sheeting as a shelter response.”
⁴⁴ Ullal et al. “Comparing thermal performance of standard humanitarian tents,” 1.

The problem with this approach is the assumption that a community can be built like a construction kit. It treats a settlement as a scalable product, when in fact a village or town is a social entity that grows from the bottom up. Kennedy argues that treating a camp as a fixed technical drawing ignores the way a settlement naturally develops through social zones and informal markets. To illustrate this, he uses the neighbourhood layout models of Caminos and Goethert (1978) as a comparative case. Both the 'optimum layout' and the 'deficient layout' are designed for a perfectly flat square.

Kennedy made this comparison to show what the UNHCR's approach has in common with this planning tradition: the assumption that a site is a blank, uniform canvas that leaves no space for topographical differences or site-specific characteristics.⁴⁵

Secondary sources argue that grid-based camp studies worldwide reveal a strict hierarchy in which the physical terrain must adapt to the UNHCR's approach, rather than the approach being adapted to the topography. According to Den Duijf local landscapes are frequently "bulldozed and ignored" in order to conform to universal technical standards.⁴⁶

1.4.2 Context Around the Shelter

The second pillar of the 'ideal model' focuses on everything surrounding the housing units : the distances between the living units, the layout of roads and firebreaks, the location of communal facilities and the relation between the built environment and the natural landscape.

Three standards are essential in order to understand this pillar: the total floor area of 45 m² per person which defines the spatial scale of the entire camp, the 30m firebreak standard and the minimum standard of 2m between shelters.

The most general standard within the context pillar is a total area of 45 m² per person. This standard includes the total area assigned to each person living in the camp: accommodation space, access routes, communal facilities, sanitation facilities, water points, firebreaks and personal garden plots.

The calculations behind this standard are significant. Of the 45 m² per person, 30 m² is reserved for roads, footpaths, educational facilities, sanitation infrastructure, firebreaks, water storage, distribution points, markets and administration. The remaining 15 m² is allocated to kitchen gardens.

This means that the actual private living space per person represents only 7,8% of the total area assigned to each individual (3,5 m² standard). The remaining 92.2% is communal, logistical or agricultural space. The camp is thus primarily an infrastructure of management, with a minimal amount of private space.

Kennedy points out that when all the minimum standards for roads, facilities, firebreaks and gardens are calculated separately and added together, they cover more than 45 m². The standard used in discussions with host countries on land allocation is, mathematically speaking, insufficient for the spatial layout that needs to be realised. This means that there is a structural deficiency that is invisibly repeated in every camp that is designed according to the standards of the Handbook.⁴⁷

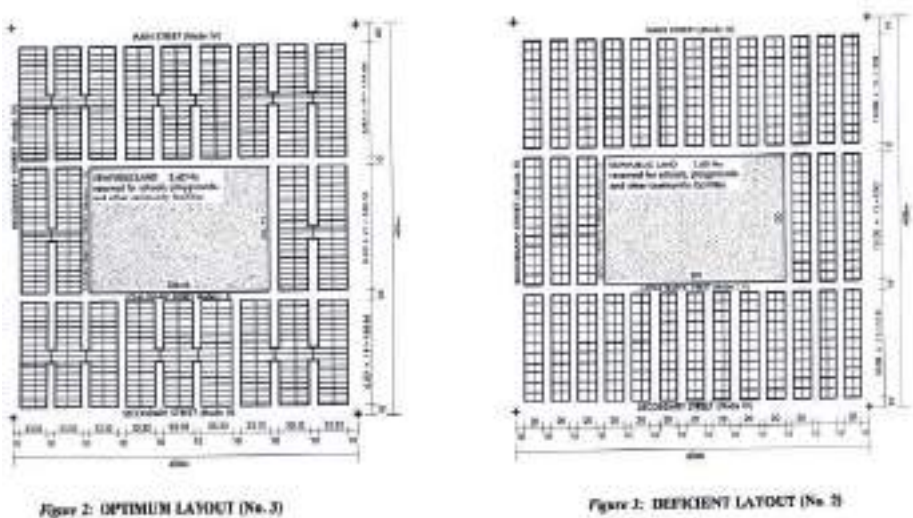


Fig. 28: Two neighbourhood layout models.
Source: James Kennedy, image Camino & Goethert.

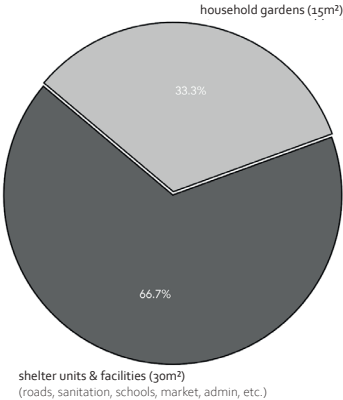


Fig. 29: Division of the recommended space per person (total 45m²).
Source: Author, 2026.

⁴⁵ Kennedy, "Towards A Rationalisation of the Construction of Refugee Camps," 10.
⁴⁶ Den Duijf, "Dignified Displacement," 3 10.

⁴⁷ UNHCR, "UNHCR Emergency Handbook: Principles & Standards for Settlement Planning."

The standard specifying that firebreaks must be 30 m wide and located every 300 m is one of the most crucial safety standards in the Handbook. It is also one of the clearest examples of how the three pillars of the 'ideal model' are intertwined: the choice of plastic sheeting and bamboo as primary building materials in the 'shelter' pillar directly results in the need for firebreaks in the 'context' pillar. Because the materials are flammable, the space between them must be wide enough to prevent a fire from spreading throughout the entire camp. The 30 m standard for firebreaks is thus not a design choice dictated by external considerations, it is a safety standard resulting from the materials used in the construction of the camp. This works in combination with the minimum distance of 2 m between each shelter, ideally twice the height of the structure. To create a layered fire control strategy the space of 2 m between shelters slows the spread of fire between individual shelters, whilst the firebreak of 30 m prevents the fire from spreading from one area of the camp to another.⁴⁸

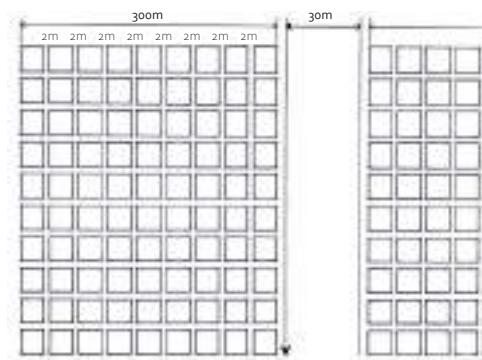


Fig. 30: Schematic representation of the 30m firebreak standard.
Source: Author, 2026.

However, the Handbook is based on a static population within a fixed spatial layout. In reality, the population of the camps is growing due to natural increase and new arrivals, which means that pressure on the available space within the camp's fixed boundaries is constantly increasing. Residents are gradually expanding into both the 2 m wide spaces between shelters and the 30 m wide firebreaks. Refugees fill these spaces with informal structures, storage areas and extra shelters to provide housing for growing households. Kennedy documents how, within a few years of a camp's establishment, the spatial standards that were appropriate for the initial population density become structurally insufficient, yet there is no official guidance in the Handbook to prevent or deal with this issue.⁴⁹

1.4.3 Management

The third and final pillar of the 'ideal model' focuses on the management of the camp overall: the rules, standards and spatial layout that allow the UNHCR and its partner organisations to manage, monitor and control the camp population. At this level, the camp reveals itself most clearly as what Agier calls a 'space of exception', where humanitarian care and control are intertwined and he states that "there is no care without control".⁵⁰ Three management standards are significant to discuss: the requirement for open access of public routes, the recommendation of a maximum capacity of 20,000 people per camp and the distance standards for water and sanitation facilities.

The first standard requires open access of public routes. The Handbook specifies that roads and pathways must remain accessible to ensure the free circulation of emergency vehicles, humanitarian supplies and security staff.⁵¹ According to Phoebe Goodwin the primary reason for this is safety, she states "safety and logistical efficiency are often best achieved through the use of a grid in spatial planning - clear and unobstructed access routes, ease of egress".⁵²

However, this standard for open access also creates a situation in which everything is permanently visible. This logic is structurally integrated into multiple standards that cover all three pillars simultaneously: the straight roads of the grid infrastructure eliminate blind spots, the minimum distance of 2 m between shelters prevents the creation of enclosed private spaces, the hierarchical layout provides wide access routes between clusters, blocks and sectors and the building density of 1:2 to 1:5 guarantees that the outdoor space is consistently larger than the area of the shelters. Together, these standards create a camp landscape in which every movement in the public space is permanently observable through the spatial design.

Goodwin explicitly confirms that "no surveillance cameras are placed in camps, only within UNHCR offices if needed" and that "the control is mostly about being able to track the locations of these affected communities so that UNHCR can continue to reach them".⁵³ However, as Patrick Mutai confirms, resident-led adaptations, such as building walls for privacy, can cause security issues such as reduced visibility

⁴⁸ UNHCR, "UNHCR Emergency Handbook: Principles & Standards for Settlement Planning."

⁴⁹ Kennedy, "Towards A Rationalisation of the Construction of Refugee Camps," 44.

⁵⁰ Agier, *Managing the Undesirables*, 4.

⁵¹ UNHCR, "UNHCR Emergency Handbook: Safe and Secure Settlements."

⁵² Phoebe Goodwin, interview by author, April, 24, 2026.

⁵³ Phoebe Goodwin, interview by author, March, 18, 2026.

and may need to be removed if they block safe access or exit. He states that “when a refugee builds a wall for privacy, it is not just a personal act of spatial appropriation, it is a direct challenge to the logic of visibility on which the camp’s management system is based”.⁵⁴

Yet Goodwin also recognizes the limitations of this spatial logic in practice: “camps often develop organically and the grid, even if initially incorporated during the design phase, is ignored or rejected. People group their dwellings according to their own personal and cultural preferences - often in circular formations. It is therefore important to find a way to integrate adequate security and access measures without destroying this organic layout”.⁵⁵ The standard that protects and the standard that controls are the same, but the people who live in the camp keep finding ways to reclaim the space between them.

The standard specifying a maximum of 20,000 persons per camp is the ‘ideal model’s’ maximum population size.⁵⁶ This standard is directly linked to the modular planning system and defines the largest number of residents that the UNHCR’s management model can support without exceeding its operational limits. By limiting

the number of residents, serious environmental damage is reduced to a minimum, overcrowding is prevented and essential services such as water, sanitation and security remain manageable.

In practice, this standard is regularly being exceeded by a factor of ten or more. The Dadaab camp in Kenya has, at certain times, provided shelter for more than 400,000 people.⁵⁷ These are not occasional or exceptional cases, this is the daily reality. When a camp designed for 20,000 people expands to 200,000 other standards are not automatically adjusted. Water points designed for 20,000 people have to supply water to ten times that number, firebreaks are surrounded by informal settlements that have grown into and over them. The 20,000 person standard is therefore both a technical specification, an administrative ambition and an acknowledgement that the UNHCR’s ‘ideal model’ was not designed for the world as it actually is.



Fig. 31: Overcrowding in Dadaab Camp, Kenya.
Source: DW News

The standards prescribing maximum distances of 500 m to water points and 5 km to health centres translate humanitarian obligations into spatial guidelines. As Kennedy states: “In reality, it is access to water sources which determines the layout and the shape of refugee camps. Water supply is the primary concern for refugee camps, even beyond the need for shelter and food. If there is no water supply, a refugee camp can quite simply not exist on that spot”.⁵⁸ Despite this importance, the 500 m water distance standard has not always been this permissive: both the second and third printed editions of the Handbook prescribed a stricter maximum of 100 m to water points per community. The current digital

fourth edition relaxes this to 500 m, with the specific note that this distance should “be reduced as the emergency stabilises”.⁵⁹

A distance of 500 m may not seem like much on paper, but in practice it has significant consequences. For someone who is weakened by displacement, poor nutrition or illness, a 1 km trip to collect water places a considerable physical burden on them, especially when they have to carry heavy cans.

In addition to the physical exhaustion, the time required to collect water has a greater impact on women and girls, leaving them with less time for education, livelihood activities and caring for children.⁶⁰

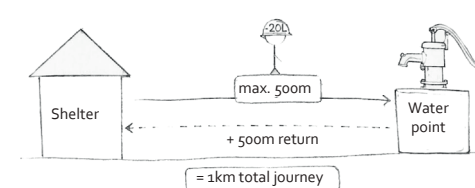


Fig. 32: Schematic representation of the UNHCR 500m water point distance standard.
Source: Author, 2026.



Fig. 33: Refugees collecting water from water point in Niger.
Source: Sean Smith, Flickr.

⁵⁴ Patrick Mutai, interview by author, March, 24, 2026.

⁵⁵ Phoebe Goodwin, interview by author, April, 24, 2026.

⁵⁶ UNHCR, “UNHCR Emergency Handbook: Principles & Standards for Settlement Planning.”

⁵⁷ UNDRR, “Integrating Disaster Risk Reduction in Kenya’s Dadaab Refugee Complex.”

⁵⁸ Kennedy, “Towards A Rationalisation of the Construction of Refugee Camps,” 51.

⁵⁹ UNHCR, “UNHCR Emergency Handbook: Principles & Standards for Settlement Planning.”

⁶⁰ Caruso et al. “Women’s experiences collecting and accessing water in Guatemala,” 3.

In camps that significantly exceed the recommended maximum of 20.000 persons, the prescribed 500 m distance to water points becomes increasingly difficult to maintain. As populations grow beyond the planned capacity, the distances between refugees and water points increase. Agier explains the safety risk this creates, namely “women in the Dadaab camps were attacked while travelling beyond the immediate camp environment to collect essential resources”.⁶¹ The 500 m rule is therefore not just a logistical standard, but also a gender-based safety standard. The shift from 100 m to 500 m and the frequent failure to implement it in practice have direct consequences for the physical safety of the camp’s most vulnerable residents.

The 5 km distance to healthcare facilities is also of great concern. For older residents, pregnant women, young

children and people with disabilities, this represents a major barrier to access care. This is particularly the case in camps where freedom of movement is limited, no public transport is available and residents may not be allowed to leave the camp without permission. A distance of 5 km on foot in conditions of heat, poor nutrition and physical weakness is not a spatial standard: it is a barrier that affects whether someone has access to healthcare at all.

In practice, it depends entirely on the availability of funding and not so much on spatial planning. The Handbook does describe what is required, but whether donor countries and NGOs make resources available for this is a completely different matter. The gap between the spatial standard and practice is one of the clearest examples of the Handbook’s limitations: whilst it can prescribe the ideal, it cannot guarantee its implementation.

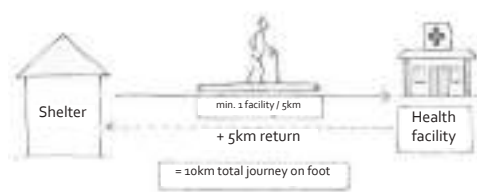


Fig. 34: Schematic representation of the UNHCR 5km health facility standard.
Source: Author, 2026.

1.5 Interim Conclusion

Chapter I has shown that the *UNHCR Emergency Handbook* does not function as a neutral reference tool, but as a powerful spatial instrument. By claiming political neutrality, the UNHCR disassociates its design authority from any personal character and masks it behind a bureaucratic system of technical standards that, in practice, determine the spatial reality of millions of displaced people. As Kennedy confirms, the Handbook has become so dominant that even organisations such as Médecins Sans Frontières and the ICRC base their own camp design standards on it, making it difficult to suggest alternatives without consulting the *UNHCR Emergency Handbook* first.

The standards that together form the ‘ideal model’ - the three pillars of shelter, the context around the shelter, and management - are not the result of architectural research. As the history of the standards’ development shows, they have their origins in three historical traditions: military spatial logic, nineteenth-century sanitary engineering and improvised practical experiences recorded in 1982 under emergency conditions. The minimum of 3,5 m² per person in warm climates, the most criticised standard in the

Handbook, has never been scientifically proven and is hardly distinguishable from the transit minimum of 3 m², which the Handbook itself considers acceptable for only three to five days. The three pillars are structurally intertwined and create their own internal contradictions: the flammable materials of the shelter pillar directly result in the firebreak requirements of the context pillar, whilst the management pillar ensures that every movement in the camp’s public space remains permanently observable.

The digitalisation of the Handbook in 2015 marks the crucial turning point discussed in the thesis. By transforming a static printed document into a permanently accessible digital platform and a mobile application, the UNHCR has institutionalised its spatial standards as a standard protocol: a universally applicable guideline which, in theory, should result in the same spatial outcome in every context worldwide - the same modular clusters, the same 30 m wide firebreaks, the same 3,5 m² per person, the same hierarchical grid - regardless of the landscape. This claim on universality forms the central hypothesis that is examined in the thesis. Chapter II tests it by applying the ‘ideal model’ to three case studies that represent different realities.

⁶¹ Agier, “Between war and city,” 327.

Chapter II: Implementation Perspective

2. A Comparative Study: The 'Ideal Model' vs. Case Studies

Chapter I focused on the theoretical and technical foundations of the 'ideal model': the standardised framework through which the *UNHCR Emergency Handbook* prescribes the physical layout of refugee camps worldwide. The three pillars - shelter, the context around the shelter and management - together form the 'standard script' which, through the process of universalisation, should in theory lead to the same spatial result in any context worldwide. If universalisation were fully achieved, every refugee camp built under the authority of the UNHCR would look the same: the same modular clusters, the same 30 m wide firebreaks, the same 3,5 m² per person, the same hierarchical grid overlaying every landscape. Regardless of whether that landscape is a military coastal zone on a Greek island, an uninhabited desert plain in North-West Kenya or a hilly river valley in South-East Bangladesh.

This second chapter moves from the blueprint to the application. It analyses whether the process of universalisation described in chapter I actually results in spatial uniformity when the 'ideal model' is confronted with three different geographical, political and social realities. The three case studies have been selected precisely because they represent the full range of displacement contexts in the period after the digitalisation of the Handbook in 2015: Kara Tepe 2 on Lesbos, Greece represents the European context. It is a repurposed military site governed by EU legislation. Kalobeyei in Turkana County, Kenya represents the African context. It is a very ambitious attempt to transform a refugee camp into an integrated urban settlement and Kutupalong Extension Camp 9 in Cox's Bazar, Bangladesh represents the Asian context. It is the world's largest refugee camp, built at a speed and on a scale that no Handbook could have predicted.

The spatial evaluation is structured around a comparative matrix, as explained in the methodology, which translates the three pillars into a set of measurable spatial standards. Each standard is then evaluated against the documented situation in the camp, determining whether the standard is applied, partially applied or not applied. The ratings are based on a combination of satellite imagery, secondary academic sources and existing field research. The matrices do not serve as a quality assessment - a checkmark does not mean that a standard is good for the residents and a cross does not always mean that the camp is worse for lacking it. Rather, they give an indication of the UNHCR's influence: a tool for measuring the impact of the Handbook on the physical layout of refugee camps.

The matrices on the following pages translate the 'ideal model' into a measurable framework. The first three matrices analyse each standard within the respective pillars individually and are each placed at the end of the corresponding case study analysis, serving as a spatial summary of the findings discussed. The fourth matrix provides a general overview of all three pillars across all three case studies and is placed at the interim conclusion of Chapter II. Together, these four matrices form the analytical framework of Chapter II: any deviation from the 'ideal model' captured in the matrices is further explained and contextualised in the case study analyses.

Legend

✓	Standard is implemented correctly	◐	Standard is partially implemented
✗	Standard is not implemented	N/A	Standard is not applicable to this specific context

2.1 Case Study I: Kara Tepe 2, Greece

2.1.1 Introduction and Historical Context



Fig. 35: Satellite view of Kara Tepe 2 Camp in Lesbos, Greece.
Source: Google Earth, 2023.

Kara Tepe 2, officially known as the Mavrovouni Reception and Identification Centre (RIC), is located on the north-eastern coast of the Greek island of Lesbos. The founding of the camp is directly linked to the destruction of its forerunner. On the night of September 8 2020, a fire that had started in a small section of the Moria camp spread rapidly through the densely clustered tents and reception centres, completely destroying the camp within a matter of hours. With more than 12.000 people left homeless, the Greek government was faced with

an urgent and extreme housing crisis. Within days of the fire, it was decided to move the entire population to the Mavrovouni site, a former army firing range.⁶²

The speed and scale of Kara Tepe 2's realisation reflects a tension that characterises the entire history of refugee camp design, namely the conflict between the humanitarian urgency of providing immediate shelter and the architectural need for a considered spatial layout adapted to the context.

As den Duijf argues in his analysis of refugee camps in Lesbos, "the engineer approach for planning refugee settlements provides for very practical, but very rigid and inflexible lay-outs. The specific context of the landscape and its advantages and disadvantages is often not analysed and used, but rather bulldozed and ignored".⁶³ At Kara Tepe 2, the UNHCR report shows that extensive infrastructure work was required to prepare the site for construction, including levelling of steep areas, laying gravel and concrete on the main roads and installing fences and shade structures.⁶⁴ The site's military roots meant it was a clearly defined and enclosed area, but even this required topographical adjustments before the standard grid layout from the Handbook could be implemented.

The political context in which Kara Tepe 2 was built is crucial to understanding its spatial character. Technical experts from the UNHCR were directly involved

in providing advice on the layout and infrastructure of the camp and the Greek government received large amounts of emergency funding from the European Union.

The camp was managed with financial support from the EU from 2020 onwards, a relationship that has shaped both the material standards that have been applied and the management structure under which the camp has operated.

According to the UNHCR's own documentation on the Kara Tepe camp, there were at least thirty organisations active in the camp in 2020, coordinated under the supervision of UNHCR staff who were assigned to the town of Mytilene.⁶⁵ This multi-organisational coordination structure created a governing environment with resources far exceeding those of a typical camp context and this environment of resources directly shaped the application of the Handbook's standards.

⁶³ Den Duijf, *Dignified Displacement*, 2.

⁶⁴ UNHCR, "Kara Tepe more than a home 2016-2021," 3.

⁶⁵ UNHCR, "Kara Tepe more than a home 2016-2021," 1-3.

⁶² Den Duijf, *Dignified Displacement*, 4-5. Mdmgreece, "Mavrovouni | New Kara Tepe."

2.1.2 Site Characteristics: The Military Heritage



Fig. 36: Satellite view of the former army firing range.
Source: Google Earth, 11 September 2020.

The Kara Tepe 2 site provided exactly the tabula rasa that the UNHCR's modular planning approach requires. Unlike the complex topographies of the other case studies, this site had already been deforested and boundary marked. When the UNHCR arrived, it turned out that a militarised architecture of fences and checkpoints had already prepared the site for the grid layout.

However, this location creates a challenging microclimate that the standards of the Handbook do not take into account. Continuous wind and high solar radiation turn the metal containers into unbearable ovens in summer and cold freezers in winter.⁶⁶ Although the Handbook tries to intervene with a spatial standard for cold climates



Fig. 37: Satellite view of Kara Tepe 2.
Source: Google Earth, 28 September 2020.

(4,5–5,5 m²), the standards only take into account surface area and say nothing about the material quality of the shelter. The standard is measured in square metres, it does not measure temperature.

Finally, this closeness to the sea puts a heavy psychological weight on the residents who have recently survived a traumatic crossing in inflatable boats. Whilst the criteria for site selection in the Handbook value water solely for hygienic and logistical reasons, the layout of the camp forces residents to live with a constant view of what is most associated with their trauma. The Handbook completely ignores the psychological geography of the Aegean coast.

2.1.3 Pillar I: Shelter

The most visible element of the shelter at Kara Tepe 2 is the use of prefabricated containers rather than the tent structures with plastic sheeting that have historically been the dominant form of emergency shelter in UNHCR camps. According to the UNHCR's own documentation, 261 prefabricated containers were installed as living units, each insulated and equipped with individual heating and air conditioning.⁶⁷ Den Duijf argues in his analysis that shelter units in planned reception centres on Lesbos are "similar to shipping containers that can be outfitted with for example solar panels and air-conditioning".⁶⁸ As said in 1.4.1 the Handbook does not prescribe a specific material for shelter construction, thus the shelters at Kara Tepe 2 are different from the actual standard, not on the basis of the 'ideal model', but because of legal requirements in the European Union which require shelter conditions that go beyond the minimum standards set out in the Handbook.⁶⁹

The Handbook's minimum standard of 3,5 m² of living space per person for warm climates is achieved in Kara Tepe 2. The Handbook is based on a standard family of five per tent or container. In this camp design, the residents even have more space than the minimum 3,5 m² per person that the Handbook prescribes. However, Tsagarousianou's field research in the original Kara Tepe camp revealed that, in the summer of 2016, the camp housed twice as many people as its intended capacity, a situation which drastically reduces the effective living space.⁷⁰ When two or more families are housed in a container designed for a single family, the floor area per person is reduced to or below the minimum specified in the Handbook. Also the physical characteristics of the container: the fixed walls and the single entrance create extreme overcrowding rather than providing dignified housing.



Fig. 38: Prefabricated ISOBOX container units at Kara Tepe 2.
Source: Wen Hoe

⁶⁶ Oxfam, "Conditions in 'Moria 2.0' camp are abysmal."

⁶⁷ UNHCR, "Kara Tepe More than A Home," 3.

⁶⁸ Den Duijf, *Dignified Displacement*, 14.

⁶⁹ UNHCR, "Aegean Islands Factsheet, 2017," 3.

⁷⁰ Tsagarousianou, "Time and mobility/immobility," 269.

The Handbook's standard for internal partitioning - separation between sleeping and living areas within the accommodation unit - is technically fulfilled in the Kara Tepe 2 containers, the solid walls of the containers create a clearly defined interior space. Yet the containers lack interior flexibility, they can't be extended, adapted or converted to respond to the changing social needs of their residents. Den Duijf argues that expanding shelters "is often one of the first things people implement after settling"⁷¹, which illustrates residents' desire to adapt their environment and claim a form of spatial agency.

The tent made of plastic sheeting prescribed by the Handbook makes spatial expansion possible: awnings can be added, adjacent shelters can be claimed and informal extensions can be built. The stiffness of the container completely prevents these possibilities. The standard for internal partitioning is fulfilled, but the ability to create spaces that feel like a home is not fulfilled.

The socio-economic space standard - the requirement that shelters include space for residents to develop economic assets and livelihood activities - is not fulfilled.

This failure is due to two related causes. The first is related to space: the containers are designed solely as living units, there is no additional storage per household, no private outdoor space for each unit and the camp's layout does not provide space for vegetable gardens or small-scale productive activities. The grid of identical containers and standardised paths is too impersonal. There is literally no space for residents to build something of their own, such as a vegetable garden or a small business.

The second cause is material: even where residents might informally claim the narrow space between containers, the camp administration prevents it from being used for productive activities. Unlike informal settlements, where the boundary between living space and workspace is flexible, the fixed entrance of the container and the open, surveilled pathways in the camp offer no semi-private space in which small-scale trade, repair work or a communal productive activity can start up without the camp authorities noticing right away.⁷² Thus, not only is the socio-economic spatial standard not fulfilled, it is also prevented architecturally and spatially.

⁷¹ Den Duijf, *Dignified Displacement*, 14.

⁷² Nur Osso and van Houtem, "Now You See Me," 731-754.



Fig. 39: A resident on a bucket in front of a standard ISO-box container, which is now being used at Kara Tepe 2 following its first implementation at Kara Tepe. The absence of any private outdoor space or furniture illustrates the spatial limits of the container as a living unit.

Source: UNHCR, taken by Achilleas Zavallis, 2017.



Fig. 40: Interior of an ISO-box container at Kara Tepe 2. A blanket spread on the floor, a heater and scattered personal belongings fill the narrow living space, while clothes hung on improvised ropes attempt to create a sense of separation within the single room.

Source: Ali Muhammad, 2022.



Fig. 41: A family gathered in the narrow space between two ISO-box containers at Kara Tepe 1, a scene that also takes place at Kara Tepe 2. A tarp stretched between the two units creates an improvised shaded area, while a repurposed bed frame serves as communal seating.

Source: Maartje Brockbernd, 2018.

2.1.4 Pillar II: Context Around the Shelter

The context around the shelter at Kara Tepe 2 is, in spatial terms, almost a perfect match of the Handbook's 'ideal model'. The combination of a flat and open site, a population well below the recommended maximum, substantial EU funding for infrastructure development and direct technical involvement of the UNHCR in the planning of the site has resulted in a camp whose spatial organisation meets the standards set out in the Handbook, with a consistency that is exceptional within the global landscape of refugee camp design.

The total area of 45 m² per person was achieved at Kara Tepe 2, but the way that space is laid out differs from what the Handbook wanted. Of the prescribed 45 m², the Handbook reserved 15 m² per person for a kitchen garden - a private, productive outdoor space attached to each shelter.⁷³ In Kara Tepe 2, this element is entirely lacking. The 45 m² is almost completely taken up by roads, fencing, sanitary infrastructure and communal facilities. The quantitative standard is fulfilled, but the intended spatial quality is not fulfilled.

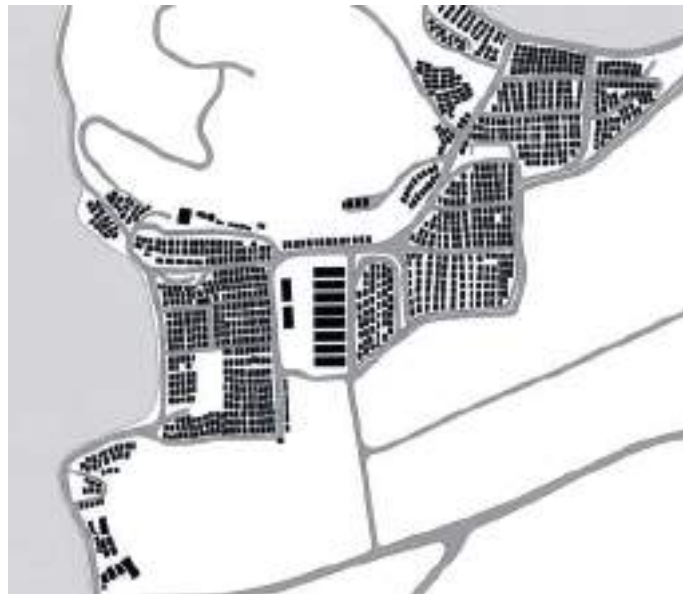


Fig. 42: Schematic site plan of Kara Tepe 2.
Source: Author, 2026.

The schematic site plan shows that a main access road runs along the edge of the camp, allowing vehicles to enter without having to cross through the residential areas. Secondary roads connect the edge of the camp with the inner area and divide the residential blocks. Tertiary paths connect the individual container units. Communal facilities are located at distances from each other that are in accordance with the distance standards set out in the Handbook and are separated from the residential zones in a way that reflects the Handbook's logistical zoning guidelines.

The standard of 30 m firebreak every 300 m is the spatial standard that carries the heaviest historical implication in Kara Tepe 2. The fire that devastated Moria on September 8, 2020 - the immediate reason for the construction of Kara Tepe 2 - spread catastrophically because the spatial conditions that should prevent fires were absent at Moria: highly flammable materials, minimal distances between shelters and the absence of effective firebreaks. Kara Tepe 2 was built in the immediate aftermath of that fire, meaning that fire safety was not just a planning consideration, but a lesson learned from the destruction of its predecessor.



Fig. 43: A firefighter attempts to control the fire at the Moria camp on September 8, 2020. The plastic sheeting is visibly melting due to the heat.
Source: Orestis Panagiotou, 2020.

No source in the available literature provides a direct measurement of the firebreaks width at Kara Tepe 2. However, a spatial analysis of the camp's layout - based on satellite images and the schematic site plan - indicates that the open spaces between the container clusters meet the 30 m standard. Two factors support this interpretation.

Firstly, the character of the site itself: a former firing range is a flat, open and completely empty area. Unlike a military base with roads, buildings and infrastructure there are no structures at all on a firing range, it is a cleared area that is specifically maintained to ensure there are no obstacles between the firing position and the target. This means that when constructing Kara Tepe 2, the designers were working with a blank canvas: no existing buildings to take into account, no fixed infrastructure to work around and no topographical limitations to overcome. This allowed the layout of the camp to be planned

⁷³ UNHCR, "UNHCR Emergency Handbook: Principles & Standards for Settlement Planning."

from scratch, with the distance between the container clusters determined by the design rather than being dictated by existing conditions.

Secondly, the modular layout of the containers themselves: the containers stand in parallel rows with standardised spacing and the clusters are separated by roads and open spaces which, based on visual analysis of the satellite images, appear to be more than 30 m wide at various points on the site. This interpretation is supported by the absence of any documented fire incident in the 261-container camp since its construction in 2020. Unlike Moria,

the combination of fireproof containers and visually sufficient open space at Kara Tepe 2 appears to have prevented this outcome.

The minimum distance of 2 m between the shelters is consistently maintained throughout the camp, which is due to the limited size of the population and the fixed, immovable character of the container units. Unlike camps where the 2 m standard gradually disappears as the population grows and residents informally extend their living space into the areas between the units, the containers in Kara Tepe 2 can't be moved or extended.



Fig. 44: View on Kara Tepe 2 in 2024.
Source: RSA, 2024.

2.1.5 Pillar III: Management

Before discussing the individual management standards, it is necessary to address the most visible and architecturally defining spatial element of Kara Tepe 2: the wall around the camp. Toscano and Ali describe how the camp is situated on a site of approximately 21.000 m² that is completely enclosed by walls and barbed wire, keeping border crossers within the camp.⁷⁴ This physical barrier is architecturally significant because it is not mentioned anywhere in the *UNHCR Emergency Handbook*. The management standards in the Handbook prescribe open access routes, clear circulation networks and an efficient internal organisation,⁷⁵ but don't prescribe fencing, since the spatial

logic of the Handbook assumes that a camp is a humanitarian site that is embedded in the surrounding landscape rather than an enclosed space. The barbed wire at Kara Tepe 2 is an addition not included in the standard script and not mentioned in the Handbook, it has been implemented by the EU's security logic.

The fence is the physical expression of what Nur Osso and Van Houtem describe as the "border within a border". Residents are permitted to leave the camp, but only under strict conditions. Toscano and Ali document that outside trips are limited to two hours a day and that residents risk being fined if found outside without documents.



Fig. 45: The fence around Kara Tepe 2, finished off with barbed wire.
Source: Ali Muhammad, 2022.



Fig. 46: The access gate of Kara Tepe 2, with ISO-box containers visible in the background.
Source: Ali Muhammad, 2022.

⁷⁴ Toscano, and Ali, "The Lesvos limbo," 3.

⁷⁵ UNHCR, "UNHCR Emergency Handbook: Safe and Secure Settlements."

The management pillar of Kara Tepe 2 is where the spatial logic of the Handbook and the EU's security logic come together. The camp's road network is designed to ensure the uninterrupted flow of emergency vehicles, trucks carrying humanitarian aid and security staff. The straight roads that ensure aid vehicles can reach every shelter in the shortest time possible also ensure that no movement within the camp goes unnoticed.

The chronopolitical analysis of life in Kara Tepe 2 camp by Tsagarousianou provides a detailed report on how the residents experience the management standards. Her interviews reveal a highly controlled environment, defined by queues, instructions and temporary restrictions: residents are told when and where to eat, when they may charge their phones and when the lights go out in the evening.⁷⁶ The camp director at the time explained this environment in terms of the residents' well-being: "predictability and structure are important in running the camp, as order is necessary for the wellbeing of the guests".⁷⁷ This language of care where residents are 'guests' and order is for their well-being reveals the dual logic that Agier identifies as the defining condition of the camp:

"there is no care without control".⁷⁸

The maximum population limit of 20,000 people per settlement unit is fulfilled at Kara Tepe 2, but the architectural importance of this achievement does not relate to the spatial layout of the camp itself. Unlike case two and case three, where the population limit isn't fulfilled because the number of displaced persons exceeds the camp's planned capacity, Kara Tepe 2 meets the standard because an external authority - the EU's border management system, the geographical boundaries of the island and the formal asylum procedures - controls the size of the population from outside the spatial framework.⁷⁹ The maximum of 20,000 people in the Handbook is a spatial standard: it defines the limit at which the road network, water infrastructure and camp management systems can no longer function as intended. In Kara Tepe 2, this limit is not reached because the spatial system framework works well, but because the political system prevents it from being exceeded. This is a crucial distinction: the standard is fulfilled, but this is achieved through political measures rather than spatial ones. The Handbook can't replicate this outcome in contexts where there is no

similar political control over population size.

From a purely geographical perspective, the standard requiring a maximum distance of 5 km from healthcare facilities is fulfilled at Kara Tepe 2: the camp is located approximately 2 km from Mytilene, the island's main town, which has a hospital and medical infrastructure. The physical distance comfortably meets the limit set out in the Handbook.

However, behind this spatial compliance lies an accessibility problem. There is

a bus connection between Kara Tepe 2 and Mytilene, but as Ali explains, only one bus route is available to pick up residents and people often have to wait for hours at the bus stop for it to arrive.⁸⁰ In practice, many residents walk the 2 km. For pregnant women, elderly residents and people with disabilities, a 2 km walk under these circumstances is not a spatial standard, it is a barrier. The Handbook measures distance in metres, it does not measure the limitations that determine whether that distance can actually be covered. On paper, the standard is fulfilled but the accessibility it was meant to guarantee is not fulfilled.



Fig. 47: Residents of Kara Tepe 2 waiting along the fence in Kara Tepe 2. The long queue and lack of seating show the difficult conditions for getting transport to Mytilene.

Source: Google Earth, 2023.



Fig. 48: The only bus route authorised to pick up residents of Kara Tepe 2, photographed from the bus stop next to the fence.

Source: Ali Muhammad, 2022.

⁷⁶ Tsagarousianou, "Time and mobility/immobility," 273.

⁷⁷ Tsagarousianou, "Time and mobility/immobility," 273.

⁷⁸ Agier, *Managing the Undesirables*, 4.

⁷⁹ Toscano, and Ali, "The Lesbos limbo," 4.

⁸⁰ Toscano, and Ali, "The Lesbos limbo," 10.

SHELTER

3,5m ² /person (warm climates)	✓
min. 2m height at lowest point (warm climate)	✓
4,5 - 5,5m ² /person (cold climates)	✓
5 persons per shelter unit	✓
lockable doors and secure access	✓
internal partitioning	✓
use of appropriate shelter materials	✓
socio-economic space for assets and livelihoods	✗
modular planning	✓

CONTEXT AROUND THE SHELTER

45m ² /person (total area: shelter + context)	✓
hierarchical layout	✓
logistical zones	✓
plot ratio 1:2 to 1:5	✓
30m firebreaks every 300m	✓
max. 50m distance to nearest cluster neighbour	✓
min. 2m between shelters	✓
infrastructure must follow topography	✓

MANAGEMENT

open access of public routes	✓
grid-infrastructure alignment	✓
max. 20000 persons/settlement unit	✓
45m ² total land area	✓
max. 500m to water point	✓
max. 5km to clinics	✓
road safety management	✓

Fig. 49: Comparative matrix of the three pillars of the *UNHCR Emergency Handbook* - shelter, context around the shelter and management - applied to Kara Tepe 2, Greece.
Source: Author, based on the digital *UNHCR Emergency Handbook*.

2.2 Case Study II: Kalobeyei, Kenya

2.2.1 Introduction and Historical Context



Fig. 50: Satellite view of Kalobeyei camp in Kenya.
Source: Google Earth, 2024.

The Kalobeyei camp is located in Turkana County, in north-western Kenya, approximately 55 km north of the town Kakuma. The settlement was established in 2016 as a direct response to the overcrowding crisis in the nearby Kakuma refugee camp, which over the span of two decades had grown into a massive settlement housing more than 150.000 people.⁸¹ With the outbreak of the civil war in South Sudan in December 2013, which led to a further mass displacement of South Sudanese refugees, Kakuma exceeded the limit of its capacity to accommodate the new arrivals through an expansion of the existing camp.⁸² A new site was needed.

The decision to build Kalobeyei as an 'integrated settlement' rather than a traditional refugee camp represents a major architectural attempt in the history of camp design in East Africa to move beyond the UNHCR's 'ideal model'. As Betts, Omata and Sterck describe in their analysis of the settlement, Kalobeyei was intended to be a model of self-reliance that would enable refugees and the local Turkana host community to live side by side. They would share markets, schools and hospitals and to develop a form of economic mutual dependence that could reduce the institutional dependence on humanitarian aid.⁸³

⁸¹ Terada et al., "Shelter in displacement," 52.

⁸² UNHCR, "Emergency Response for the South Sudan Situation," 7.

⁸³ Betts et al., "The Kalobeyei Settlement," 193.

The design of Kalobeyei involved an exceptional collaboration between various actors. The UNHCR coordinated the humanitarian support and established the technical framework - based on the standards in the *Emergency Handbook* - for the spatial design of the camp. UN-Habitat was engaged to develop an advisory development plan to serve as a guide for the transition to a more sustainable urban environment. The Kenyan government participated in the planning process through the Turkana County authorities and had official control over the land and its use. Furthermore, a range of external architectural and design actors, specifically the collaboration between UN-Habitat and the Voluntary Architects' Network led by the Japanese architect Shigeru Ban, provided prototypes for shelters that

went beyond the minimum standards of the Handbook, moving towards a locally adapted housing design in line with the climate conditions.⁸⁴

The case analysis by Jahre et al. on approaches for the design of refugee camps in Kenya, Ethiopia, Greece and Turkey confirms that the UNHCR's technical standards remained the fundamental framework for the spatial organisation of the settlement. The research shows a tension between the ambitious ideas of the integrated settlement model and the practical reality of its implementation. The integrated settlement model focuses on urban integration, self-reliance and shared public spaces, whilst the practical reality focuses on the grid, the block, the cluster and the minimum area of 3,5 m² that the Handbook has always prescribed.

2.2.2 Site Characteristics: A Blank Canvas in Extreme Conditions

The Kalobeyei site is located in Turkana County, approximately 15 km west of the Kakuma refugee camp complex. Monteil describes the settlement as "flat, dry and windy"⁸⁵, a description that captures the three most defining spatial conditions of the site and how they directly influenced the design of the camp.

The climatic conditions in Turkana County represent a major challenge in terms of the universal applicability of the shelter standards. The Turkana County Government reports an average annual rainfall of 200 millimetres with short but intense storms causing frequent sudden floods. Temperatures range between 20 and 41 degrees Celsius⁸⁶, causing daily extreme heat.

The hydrology of the site reinforces this challenge. When storms hit, the flat and impermeable soil allows water to spread rapidly across the landscape. Monteil's design explicitly required raised platforms and facilities for managing water flows as essential elements of any shelter prototype. The UN-Habitat responded to this by structuring the entire spatial layout around the main

riverbeds, which divide the settlement into three districts, with public and commercial infrastructure spread along the smaller riverbeds.⁸⁷ The Handbook standard that states 'site layout must respond to the natural topography'⁸⁸ is respected in Kalobeyei. However, this is only because UN-Habitat's specific planning process for the site made it possible, not because the Handbook's generic modular system is capable of producing this result on its own.

The site is also characterised by strong, continuous winds blowing in from Lake Turkana, which affect the thermal comfort of shelters, intensify dust storms and determine the orientation of the shelters.⁸⁹

Finally, the scarce grasslands on the dry terrain offer almost no protection against direct sunlight. Unlike sites in more forested areas, where vegetation can temper the microclimate around the shelters, Kalobeyei offers no such protection. The Handbook doesn't discuss the relationship between the local vegetation and thermal comfort, it assumes that the shelter itself is the main thermal boundary.

⁸⁴ Ban, and Monteil, *Turkana Houses*, 25.

⁸⁵ Ban, and Monteil, *Turkana Houses*, 27.

⁸⁶ Republic of Kenya, "Turkana County Climate Change Policy," 4.

⁸⁷ Ban, and Monteil, *Turkana Houses*, 27.

⁸⁸ UNHCR, "UNHCR Emergency Handbook: Principles & Standards for Settlement Planning."

⁸⁹ Ban, and Monteil, *Turkana Houses*, 25-84.

2.2.3 Pillar I: Shelter

When Monteil first arrived at Kalobeyei Settlement in July 2017 as part of the VAN/UN-Habitat collaboration, the site was already dominated by the standard UNHCR temporary shelters: structures covered in tarpaulin, arranged in rows and as he himself described “were laid out to look like a military camp”.⁹⁰ This first impression is architecturally significant as it shows that the integrated settlement model, which was designed to go beyond the traditional humanitarian camp, initially looked exactly the same as a standard camp.



Fig. 51: Rows of standard UNHCR family tents in the new Kalobeyei settlement, showing the grid layout that dominated the site prior to the construction of the VAN prototype shelters.

Source: Quartz, Lily Kuo, 2022.

The participatory study with the residents immediately revealed that the standard shelters were insufficient. When residents were asked about their shelters, they raised three key concerns: the risk of snakes and scorpions entering through the tarpaulin, the

ability of thieves to cut through it easily and the material’s vulnerability to the strong, constant winds and dust storms common in the Turkana climate,⁹¹ as mentioned in 2.2.2. These findings show that the standard shelter material - plastic sheeting - doesn’t meet the requirements in a context where local conditions reveal limitations in terms of insulation, construction and safety.

The prototype shelters designed by Shigeru Ban’s Voluntary Architects’ network (VAN) represented the settlement’s most architecturally ambitious response to these limitations. However, they were explicitly designed as limited-scale prototypes rather than as a replacement for standard temporary shelters on a large scale. This is confirmed by VAN’s own documentation of the construction process: “We are not aiming for mass production of a vast number of houses. We are simply trying to build inexpensive well-built pilot shelters with good construction details.”⁹² Thus, the prototype initiative represents a spatially limited experiment within a settlement that, for the majority of its inhabitants, continued to rely on the standard humanitarian housing approach.

Ban presented three different prototype designs, each consisting of a single 18 m² space with a door, three windows and a roof, with each design utilising different building materials and techniques adapted to the local context.⁹³ The three types are not just aesthetic variants: each represents a different interpretation of the standards set out in the Handbook and of Ban’s design approach, which prioritises the use of local construction techniques and materials that can be maintained and renovated by local communities.⁹⁴

Type A is the Paper Tube House. The design uses paper tubes for cladding, which are woven together with rope

using a technique directly based on the Turkana tradition of weaving tree branches together to build huts.⁹⁵ This choice of materials is an example of a contemporary application of traditional local building techniques in which the plastic sheeting of the standard UNHCR tent is replaced by a structure whose construction method is already familiar to the local population. It is precisely this connection to existing skills that makes the Type A an architectural expression of self-reliance: the shelter can be replicated, maintained and adapted by residents without requiring specialist knowledge or dependence on the supply chain.

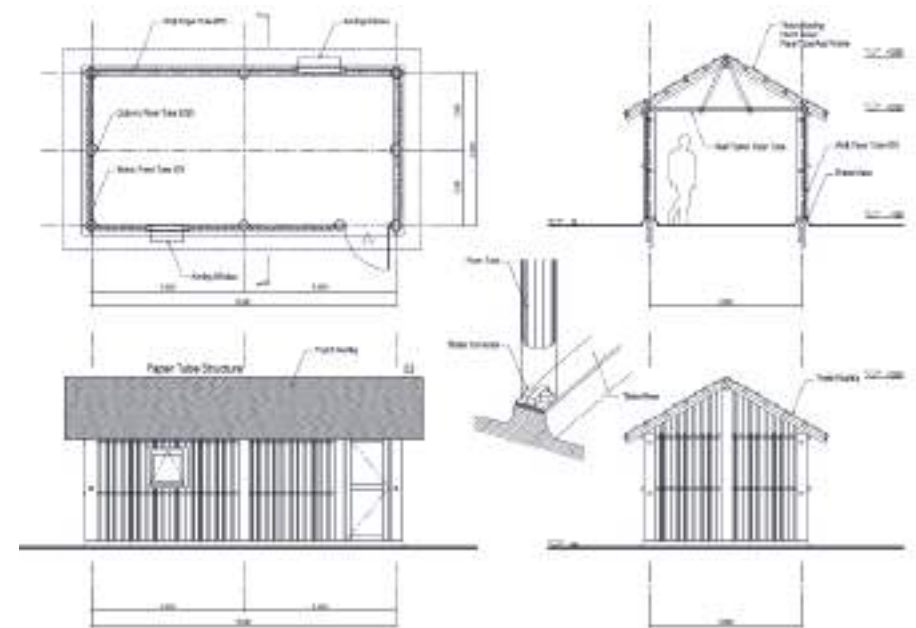


Fig. 52: Groundplan of the Paper Tube House.

Source: Shigeru Ban Architects, 2017.

⁹⁰ Ban, and Monteil, *Turkana Houses*, 37.

⁹¹ Ban, and Monteil, *Turkana Houses*, 56.

⁹² Ban, and Monteil, *Turkana Houses*, 143.

⁹³ Ban, and Monteil, *Turkana Houses*, 81.

⁹⁴ Ban, and Monteil, *Turkana Houses*, 38.

⁹⁵ Ban, and Monteil, *Turkana Houses*, 81.

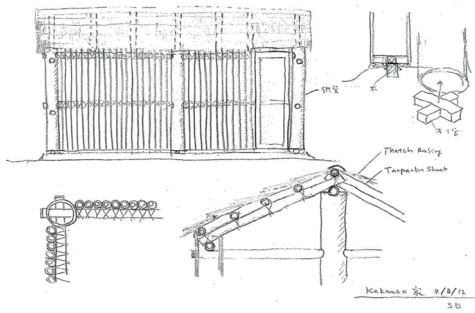


Fig. 53: Shigeru Ban's sketch of Type A.
Source: Shigeru Ban Architects, 2017.

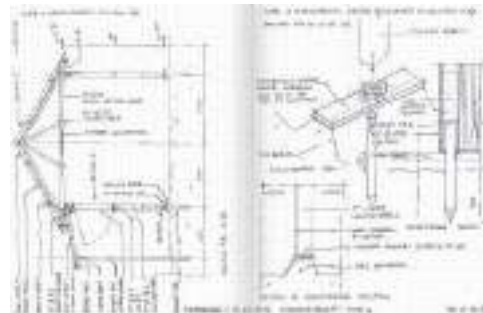


Fig. 54: Type A section AA + detail related to section AA.
Source: Shigeru Ban Architects, 2017.

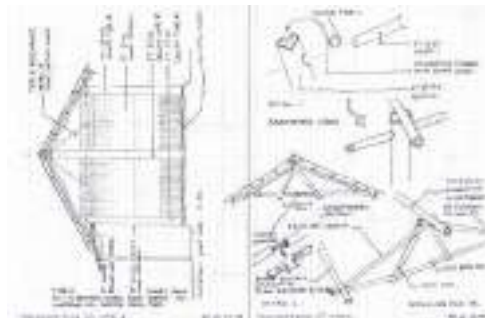


Fig. 55: Type A elevation short side + detail roof structure.
Source: Shigeru Ban Architects, 2017.



Fig. 56: Assembly of paper tube columns and beams.
Source: Shigeru Ban Architects, 2019.



Fig. 57: Women weaving the wall.
Source: Shigeru Ban Architects, 2019.



Fig. 58: Completion of Type A.
Source: Shigeru Ban Architects, 2019.

Type B is the Timber Frame House. The design uses a timber frame filled with burnt bricks as a cladding material, inspired by Ban's earlier project for emergency housing in Nepal following the 2015 earthquake.⁹⁶ Ban explained that the structural logic of the design is appropriate for the context of Kalobeyei because of its simplicity: the brick serves primarily as a filling material, meaning

that the structural stability of the shelter is not threatened if the brickwork is not perfect.⁹⁷ The design also creates direct economic opportunities for the local community, as the timber frames and bricks can be produced locally, supporting the development of a small-scale construction sector within the settlement.

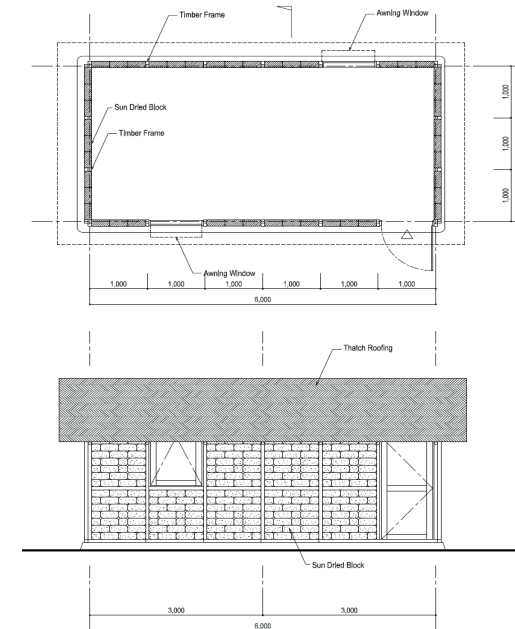
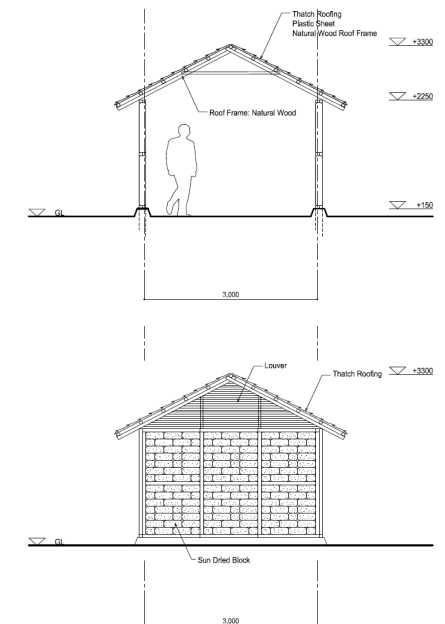


Fig. 59: Groundplan of the Timber Structure House.
Source: Shigeru Ban Architects, 2017.



⁹⁶ Ban, and Monteil, *Turkana Houses*, 9.
⁹⁷ Ban, and Monteil, *Turkana Houses*, 81.

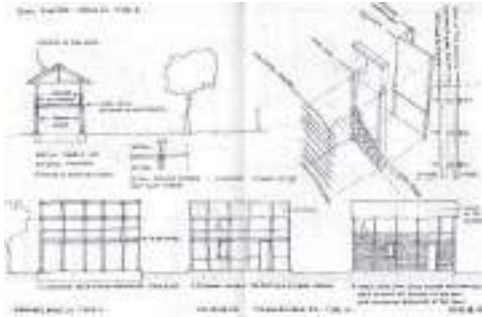


Fig. 60: Shigeru Ban's sketch for Type B.
Source: Shigeru Ban Architects, 2017.

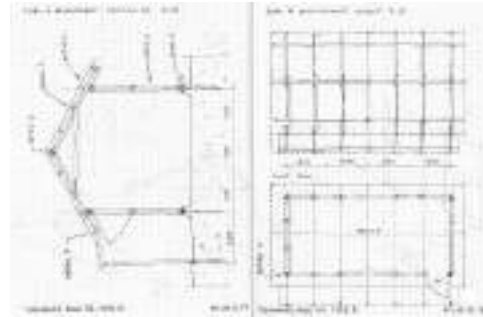


Fig. 61: Type B section AA + roof plan.
Source: Shigeru Ban Architects, 2017.

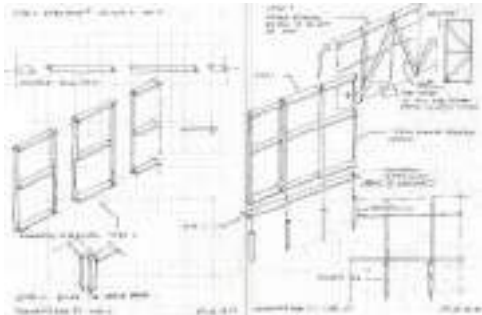


Fig. 62: Type B bracing system.
Source: Shigeru Ban Architects, 2017.



Fig. 63: Completion of timber framework.
Source: Shigeru Ban Architects, 2019.



Fig. 64: Brickwork to infill the frame.
Source: Shigeru Ban Architects, 2019.

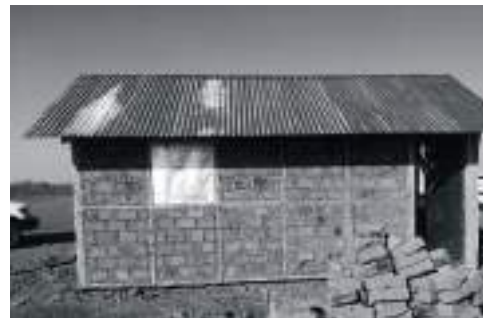


Fig. 65: Completion of Type B.
Source: Shigeru Ban Architects, 2019.

Type C is the CEB house, built using compressed earth blocks. This technique involves using soil from the site itself, which is compressed with a small amount of cement.⁹⁸ According to Ban, this is very common in Africa where suitable soil is available and it's an efficient and inexpensive way to build houses.⁹⁹ The use of locally sourced soil as the primary building

material is an immediate illustration of the ecological and economical logic behind the prototype approach: the material is available on site, requires no transport and provides a shelter with a much greater thermal mass than the standard plastic sheet tents, thereby directly responding to the extreme temperatures described in 2.2.2.2.

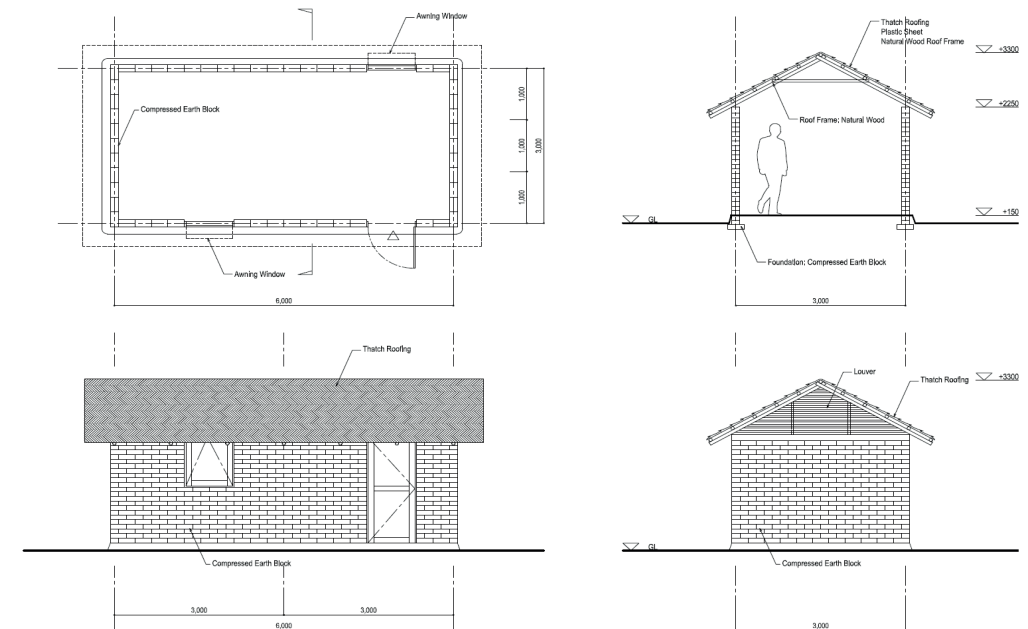


Fig. 66: Groundplan of the CEB House.
Source: Shigeru Ban Architects, 2017.

⁹⁸ Ban, and Monteil, *Turkana Houses*, 62-63.
⁹⁹ Ban, and Monteil, *Turkana Houses*, 81.

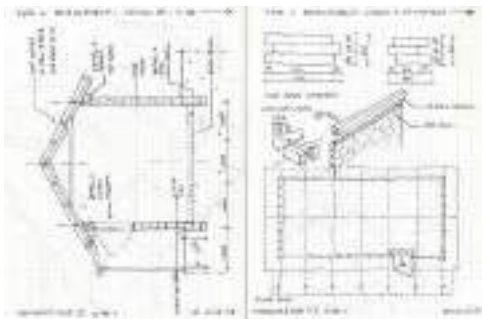


Fig. 67: Shigeru Ban's sketch for Type C.
Source: Shigeru Ban Architects, 2017.

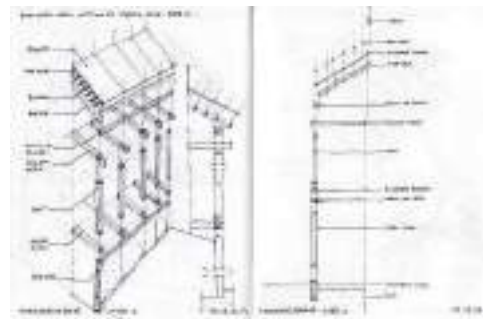


Fig. 68: Type C exploded view.
Source: Shigeru Ban Architects, 2017.



Fig. 69: Stacking of compressed earth blocks.
Source: Shigeru Ban Architects, 2019.



Fig. 70: Completion of Type C.
Source: Shigeru Ban Architects, 2019.



Fig. 71: Types A + B + C
Source: Shigeru Ban Architects, taken by Takeshi Kuno, 2019.

The minimum standard of 3,5 m² of covered living space per person in warm climates is applied in Kalobeyei through the system of assigning building plots. The Advisory Development Plan translates this into a requirement for a total of 210.000 m² of minimum accommodation space for the planned population of 60.000 people.¹⁰⁰ Each of the three prototype shelter units, with an area of 18 m² for a household of five people, provides 3,6 m² per person, just slightly more than the absolute minimum standard of the Handbook. However, the standard is not achieved throughout the entire settlement. The Development Advisory Plan states that the average household size among the refugee population is 5,9 people,¹⁰¹ which is higher than the five people on which the modular planning is based. A shelter of 18 m² housing a household of six people amounts to 3,0 m² per person, which is equal to the minimum of 3 m² for transit camps, which the Handbook describes as acceptable for a stay of only three to five days. This means that the standard is only partially fulfilled: the design of the prototype and the division of the plots are technically correct, but the standard is not fully met due to the demographic reality of the

refugee households living in these units.

The standard for internal partitioning - the separation of sleeping areas from living and cooking areas within the shelter - is not fulfilled. The standard UNHCR family tent has no internal layout, all three prototypes also consist of a single, undivided space. Over time, the logic of self-reliance in the prototypes, particularly the ability of residents to maintain and adapt their shelter units independently, may lead to the internal spatial layout that the original design doesn't provide. Ban stressed the need to build simple structures that could be replicated by people who might not be technically skilled, meaning that the absence of internal partition walls is an intentional design choice and not a mistake.¹⁰² The issue of internal partition walls was raised during the presentation of the three prototypes by Yuka Terada of UN-Habitat: "Are there plans to include partition walls in any of the designs?"¹⁰³ to which Monteil replied: "Two years later, and after seven different pilot houses tested, I will finally set-up a Manual of our latest pilot that refers to Yuka's requirement."¹⁰⁴ suggesting that internal partition walls were recognised as a weakness in the design.

¹⁰⁰ UN-Habitat, *Kalobeyei Settlement Advisory Development Plan*, 110-111.

¹⁰¹ UN-Habitat, *Kalobeyei Settlement Advisory Development Plan*, 15.

¹⁰² Ban, and Monteil, *Turkana Houses*, p 62-63., *Turkana Houses*, 81.

¹⁰³ Ban, and Monteil, *Turkana Houses*, p 62-63., *Turkana Houses*, 84.

¹⁰⁴ Ban, and Monteil, *Turkana Houses*, p 62-63., *Turkana Houses*, 85.

2.2.4 Pillar II: Context Around the Shelter

The context around the shelters in Kalobeyei is shaped by a planning framework that goes beyond the guidelines set out in the *UNHCR Emergency Handbook*. UN-Habitat states in the Advisory Development Plan that “the plan for the new Kalobeyei settlement is not one that can simply follow the basic guidelines for planning a refugee camp”.¹⁰⁵ Instead, the plan uses a mixed approach that combines the Kenyan Planning Handbook, the Sphere Standards and the UNHCR guidelines into a single framework designed to serve both the short-term humanitarian needs of a rapidly growing refugee population and the long-term urban development goals of Turkana County.¹⁰⁶ The combination of a suitable topographical location, a specific planning process and the construction of infrastructure in advance of large-scale population influx allowed spatial standards for firebreaks, safety distances, building coverage ratios and the hierarchy of infrastructure to be properly applied. Of the three case studies discussed in this chapter, the context pillar of Kalobeyei aligns most closely with the ‘ideal model’ of the Handbook. This alignment is most

clearly visible in the spatial organisation of the shelters and the distribution of infrastructure across the site. The residential blocks are organised on a walkable scale of 100x60 metres, each containing 20 plots of 10x20 metres.¹⁰⁷



Fig. 72: Aerial view of the planned residential blocks in Kalobeyei.
Source: Xinhua, 2021.

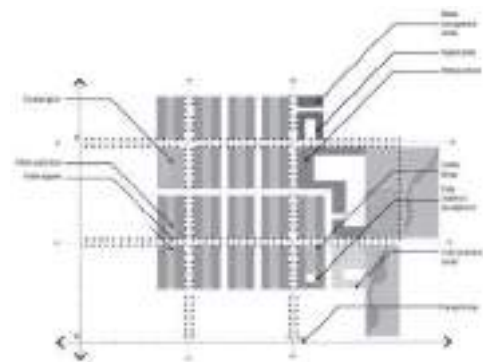


Fig. 73: Residential concept of Kalobeyei Camp.
Source: UN-Habitat, 2018.

The design of the residential blocks is entirely focused on creating lively and safe streets. By intentionally orienting the shelters towards the street, a natural sense of community is created. Small public squares have been

created at the ends of each block where communal facilities, such as water taps and space for local shops or kiosks naturally develop into meeting places. In addition, at the heart of each block is a communal vegetable garden that encourages urban farming. This design prevents dead spaces and ‘backlands’, whilst enhancing the social life on the street and in public spaces.¹⁰⁸

The focus on the surroundings of the shelter is also visible in Monteil’s preliminary design sketches for the residential plots, which include elements that respond directly to the local conditions: extensive roofs to provide shade, raised platforms to protect against sudden flooding, space for kiosk infrastructure at the front of each plot, an external sanitary block, an open kitchen and an attached vegetable garden. This design approach meets the standard in the Handbook for socio-economic space within the residential plot, which is space that enables residents to engage in activities within their living environment that allow them to provide for their own livelihood, rather than being entirely dependent on communal or external facilities.

Nevertheless, the report is also aware of the structural limitations that prevent these goals from being achieved. The

UN-Habitat is clear on the issue of social integration between refugees and the host community within the neighbourhoods: “given the context of the site focusing on housing refugees for the short-medium term it is difficult from the outset to fully support social mix within the residential areas. However for Kalobeyei, as integrating refugees and host communities is a key component of the proposal, it is recommended that host community members gradually are given opportunities to live within the settlement in order to promote the social mix and diversity.”¹⁰⁹ Mukanga et al. confirm that, in practice, the architectural experiments and public spaces often remained isolated islands rather than actually connecting the settlement and its residents.¹¹⁰

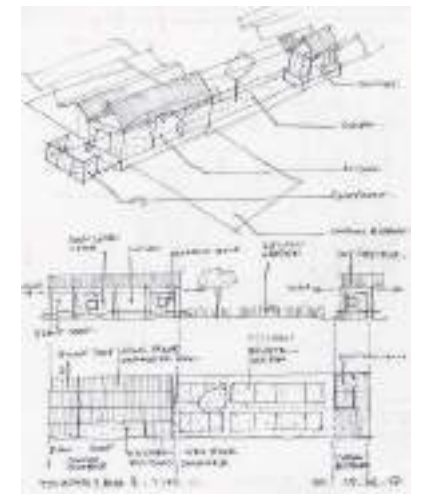


Fig. 74: Public space concept of Kalobeyei Camp.
Source: Shigeru Ban Architects, 2017.

¹⁰⁵ UN-Habitat, *Kalobeyei Settlement Advisory Development Plan*, 109.

¹⁰⁶ UN-Habitat, *Kalobeyei Settlement Advisory Development Plan*, 109.

¹⁰⁷ UN-Habitat, *Kalobeyei Settlement Advisory Development Plan*, 147.

¹⁰⁸ UN-Habitat, *Kalobeyei Settlement Advisory Development Plan*, 147.

¹⁰⁹ UN-Habitat, *Kalobeyei Settlement Advisory Development Plan*, 101.

¹¹⁰ Mukanga et al., “From Kibera to Kalobeyei,” 311-320.

2.2.5 Pillar III: Management

The management of Kalobeyei reflects the settlement’s mix of institutions. The UN-Habitat divides the settlement into four scale levels of spatial management: the local block level of approximately 100 people, the community level of 5.000 people, the neighbourhood level of 20.000 people and the level of the entire settlement of 60.000 people.¹¹¹ This hierarchical structure follows the logic of the UNHCR’s modular planning system, but on a scale three times larger than the maximum settlement unit defined in the Handbook.

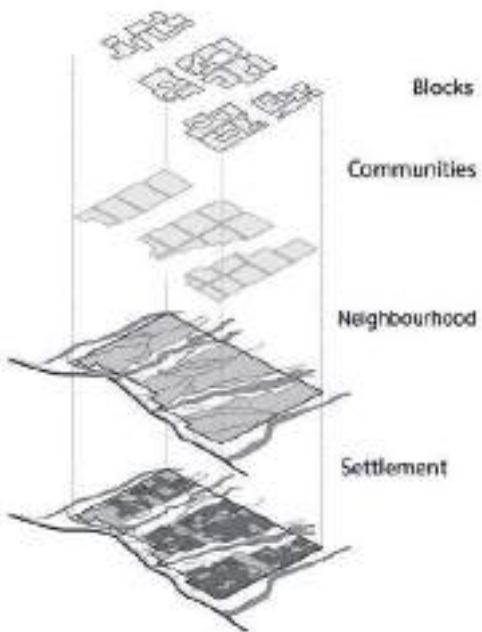


Fig. 75: Interconnected scales of spatial management.
Source: UN-Habitat, 2018.

Furthermore, the management standards were based on a planned population of 60.000 people. In April 2026, the registered population of Kalobeyei reached 83.000 people,¹¹² meaning that the settlement’s own planned capacity had already been exceeded. This has put even more pressure on all spatial facilities - from water supply to educational facilities - which were designed for a smaller population.

The standard for water points is the point at which the gap between the plan’s ambitions and the practical reality is clearly visible. The design of the residential blocks in the plan prescribes a water point within a radius of 50 m of each residential unit, a standard that is considerably stricter than the maximum distance of 500 m set out in the Handbook.

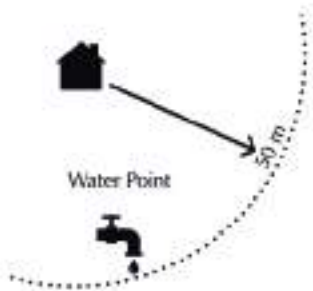


Fig. 76: Average walkable distance to water points.
Source: UN-Habitat, 2018.

However, in practice, the same report also notes that water points in Kalobeyei are unevenly distributed and concentrated within a 1 km radius of the Kalobeyei market, whilst the facilities are located approximately 12 km from the refugee site itself.¹¹³ As Betts, Omata and Sterck confirm, 90% of those involved in agricultural activities

mentioned the lack of access to water points as one of their main challenges.¹¹⁴ This water scarcity has continued well beyond the period covered by the sources consulted for this study. In March 2025, reports still indicated that families in Kalobeyei were forced to travel long distances and wait in long queues at the few available water points.



Fig. 77: Water point in Kalobeyei.
Source: UN-Habitat, 2018.



Fig. 78: Long queues at scarce water points in Kalobeyei.
Source: Standard Digital, taken by Bakari Ang’ela, 2025.

¹¹¹ UN-Habitat, *Kalobeyei Settlement Advisory Development Plan*, 135.
¹¹² UNHCR, “Kenya Registered refugees and asylum-seekers as of 30 April 2026,” 1.

¹¹³ Ban, and Monteil, *Turkana Houses*, 84.
¹¹⁴ Betts et al., “The Kalobeyei Settlement,” 213.

SHELTER

3,5m ² /person (warm climates)	✓
min. 2m height at lowest point (warm climate)	✓
4,5 - 5,5m ² /person (cold climates)	N/A
5 persons per shelter unit	✓
lockable doors and secure access	◐
internal partitioning	✗
use of appropriate shelter materials	✓
socio-economic space for assets and livelihoods	◐
modular planning	✓

CONTEXT AROUND THE SHELTER

45m ² /person (total area: shelter + context)	✓
hierarchical layout	✓
logistical zones	✓
plot ratio 1:2 to 1:5	✓
30m firebreaks every 300m	✓
max. 50m distance to nearest cluster neighbour	✓
min. 2m between shelters	✓
infrastructure must follow topography	✓

MANAGEMENT

open access of public routes	✓
grid-infrastructure alignment	✓
max. 20000 persons/settlement unit	✗
45m ² total land area	◐
max. 500m to water point	◐
max. 5km to clinics	✓
road safety management	✓

Fig. 79: Comparative matrix of the three pillars of the *UNHCR Emergency Handbook* - shelter, context around the shelter and management - applied to Kalobeyei, Kenya.

Source: Author, based on the digital *UNHCR Emergency Handbook*.

2.3 Case Study III: Kutupalong

Camp 9, Bangladesh

2.3.1 Introduction and Historical Context

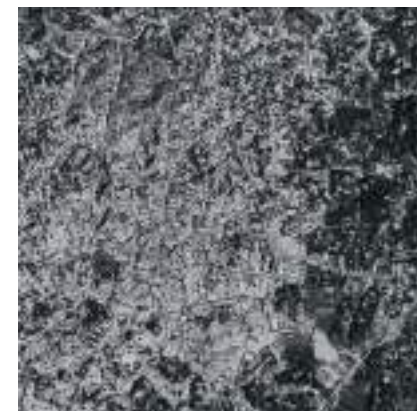


Fig. 80: Satellite view of Kutupalong Extension camp 9 in Bangladesh.
Source: Google Earth, 2024.

Kutupalong Extension Camp 9, located in Cox's Bazar district in south-eastern Bangladesh, is the case study that most clearly exposes the limitations of the 'ideal model' of the UNHCR's *Emergency Handbook* when confronted with a displacement crisis of such unprecedented scale and speed. The Kutupalong camp complex was urgently constructed to respond to the massive influx of Rohingya refugees from Myanmar. Camp 9 was selected specifically for this analysis because it demonstrates the physical consequences of the UNHCR's spatial standards when applied to a camp that grew without any formal spatial framework before a grid could be established.¹¹⁵ As Goodwin, who worked in Cox's Bazar during the emergency response, states "the vast majority of Kutupalong was spontaneously settled with the vast influx of Rohingya refugees and then we subsequently tried to overlay some 'order' with the insertion of access routes and key community services"¹¹⁶ and by "relocating families from areas prone to flooding and landslides".¹¹⁷ She also described efforts to relieve the pressure on the densely built-up camps, so that firebreaks and evacuation routes could be created.¹¹⁸

¹¹⁵ Phoebe Goodwin, interview by author, March, 18, 2026.

¹¹⁶ Phoebe Goodwin, interview by author, April, 24, 2026.

¹¹⁷ Phoebe Goodwin, interview by author, March, 18, 2026.

¹¹⁸ Phoebe Goodwin, interview by author, March, 18, 2026.

This is an important architectural insight because it shows that Camp 9 was not planned and then populated, but rather populated and then partially planned. The 'ideal model' wasn't the blueprint from which the settlement grew, but the standard that was used to evaluate an already existing built environment that turned out to be seriously insufficient.

On March 22, 2021 a fire broke out in the densely populated settlement of Camp 9 and spread rapidly through the bamboo shelters covered with

plastic sheeting destroying over 10.000 shelters¹¹⁹ and killing 15 people.¹²⁰ As Kuligowski et al. demonstrate in their simulation study on evacuation in humanitarian settlements, the spatial layout of Camp 9 - a combination of high density, highly flammable building materials, limited evacuation routes and fencing - reinforced the spread of the fire and prevented the evacuation of residents.¹²¹ The fire did not break out because of the spatial layout of Camp 9, it was intensified by it.



Fig. 81: People search for their belongings after the fire burned down all the shelters in Camp 9.
Source: The New Humanitarian, taken by Ro Yassin Abdumonab, 2021.



Fig. 82: A panoramic photograph of the destruction by the fire in Camp 9.
Source: United Nations, 2021.

In this study, the response in the aftermath of the fire provided the most evidence on the connection between the standards of the Handbook and the physical reality of displacement. The Shelters Projects report shows that, even though there were opportunities for an ambitious redesign of the space to improve safety conditions, the urgent need to rehouse displaced families led to the camp being rebuilt 'row by row'.¹²² Consequently, the dangerous density and spatial logic that had made the fire so catastrophic ended up being replicated.

As Goodwin confirmed based on her direct experiences in Cox's Bazar, families who had been displaced from dangerous, flood-prone or overcrowded areas returned to their previous shelters, thereby recreating the very conditions that the rehousing was intended to eliminate.¹²³ She stated that: "UNHCR

is not a police force - we can only exert limited influence on the organisation of a community by working with residents and educating them about the importance of safety and security measures".¹²⁴

Patrick Mutai didn't view the fire in Kutupalong, in the interview, as a failure of the Handbook itself, but as an illustration of the gap between standards and practice: the difficulty of applying technical standards in densely populated, limited environments reflects the conditions under which any spatial framework must operate. Furthermore, the effectiveness of the layout depends on their adaptation to the context, practical enforcement and strong community engagement.¹²⁵ This perspective positions the case not as an exception, but as the clearest example of a structural limitation that, to varying degrees, is present in all three case studies.

119 Shelters Projects 9th edition, "Fire Response Bangladesh," 94.

120 Human Rights Watch, "Bangladesh= Refugee Camp Fencing Cost Lives in Blaze."

121 Kuligowski et al. "Simulating Evacuation of Humanitarian Settlements," 1328 - 1335.

122 Shelters Projects 9th edition, "Fire Response Bangladesh," 95.

123 Phoebe Goodwin, interview by author, April, 24, 2026.

124 Phoebe Goodwin, interview by author, April, 24, 2026.

125 Patrick Mutai, interview by author, March, 24, 2026.

2.3.2 Site Characteristics: The Complex Terrain of Cox's Bazar

The physical geography of Camp 9 is the biggest challenge for the UNHCR's modular planning approach among all three case studies discussed in this chapter. Unlike the flat, deforested former firing range at Kara Tepe 2 and the open desert plain at Kalobeyei, Camp 9 is situated on a complex hilly terrain characterised by forested hills, river valleys and seasonal drainage canals that are prone to flooding and landslides.¹²⁶ As Goodwin confirmed on the basis of her work in the area, the UNHCR's spatial interventions in Kutupalong were specifically focused on rehousing families from the areas prone to flooding and landslides that the spontaneous settlement had occupied.¹²⁷

The scale of the settlement complicates the challenges caused by the terrain. The UNHCR's own standard prescribes a maximum of 20,000 people per settlement unit. Camp 9 alone houses 46,015 registered persons, more than twice the standard maximum. Across the entire Kutupalong complex with its 34 camps, the total registered Rohingya refugee population almost reached 1,200,000 refugees as of April 30, 2026.¹²⁸ This makes it the largest refugee camp in the world and the most extreme case in this study of the gap between the Handbook's spatial standards and the demographic reality of displacement.



Fig. 83: The terrain is undeveloped, no refugee camp is yet visible.
Source: Google Earth, March 15, 2015.

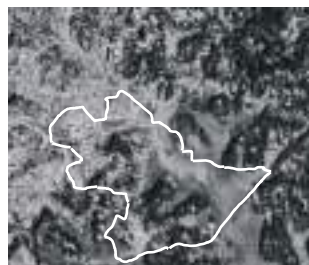


Fig. 84: Following the mass influx of Rohingya refugees, the site is in rapid expansion.
Source: Google Earth, January 17, 2018.



Fig. 85: The camp has reached its full development, housing 46,015 registered persons in Camp 9.
Source: Google Earth, January 19, 2025.

¹²⁶ Shelters Projects 9th edition, "Fire Response Bangladesh," 93.
¹²⁷ Phoebe Goodwin, interview by author, March, 18, 2026.
¹²⁸ UNHCR, "Operational Data Portal."

2.3.3 Pillar I: Shelter

Camp 9 doesn't meet the minimum standard of 3,5 m² of covered living space per person in hot climates. The report on fire safety in Bangladesh confirms the extreme population density that characterised the affected parts of the settlement and documents that the spatial design of the camp was incompatible with any minimum safety standards. The report records a shelter density of 3 m² per person, falling below even the Handbook's transit camp minimum.¹²⁹ As the camp grew spontaneously, new families occupied every available space on the hills. This made the camp far too crowded and overpopulated and that is precisely the dangerous situation the Handbook was trying to avoid.

The standard of five people per shelter unit is also not fulfilled in Camp 9. Goodwin described the scale of the demographic pressure on the individual shelter units and the limitations of the UNHCR's capacity to deal with this and said that the effort to relocate families from the most dangerous parts of the camp was nullified by families returning to their original shelters and restoring the population density that the relocation was intended to reduce.¹³⁰

Furthermore, the standard requiring the use of appropriate shelter materials is not respected. The bamboo poles and plastic sheeting, which are the main building materials of the camp, fail to meet the standard in precisely the same ways as identified in the Kalobeyei participatory study, specifically thermal performance, structural resistance to local climate conditions and safety. As the Shelter Projects report confirms, the combination of bamboo and plastic sheeting created the conditions that allowed the fire in 2021 to spread through the densely populated settlement with deadly speed.¹³¹

Unlike the prototype project in Kalobeyei, which responded to the failure of plastic sheeting with locally suitable alternatives, there was no similar material solution in Kutupalong. The materials were not chosen for their suitability to the context, but were forced by the emergency: the speed of the influx, the lack of a supply chain infrastructure and the immediate need for shelter for hundreds of thousands of people left no space for the careful material choices that the Handbook's standards require.¹³²

¹²⁹ Shelters Projects 9th edition, "Fire Response Bangladesh," 93.

¹³⁰ Phoebe Goodwin, interview by author, March, 18, 2026.

¹³¹ Shelters Projects 9th edition, "Fire Response Bangladesh," 93.

¹³² UNHCR, "Rohingya refugees race to fix up shelters as monsoon looms."

The standard bamboo and plastic sheet shelters in Camp 9 lack lockable doors and secure access. The entrance to the standard shelter in Kutupalong is an opening in the plastic sheet wall, a barrier that offers no real protection against intruders and provides no sense of security for the residents. The absence of secure shelter access is directly linked to the protection risks for residents, particularly for women and children. These risks are further intensified by the extreme population density in the settlement. As the UNHCR states “the camps are among the most densely

populated places in the world with very little space between shelters”.¹³³ In a context where shelters are separated by only a few centimetres rather than metres, the absence of a lockable door means that every household is directly accessible from the shared circulation space without the need to cross a barrier.

The standard for internal partitioning is also missing. The bamboo shelter consists of a single undivided space with no structural separation between sleeping, cooking and living areas.



Fig. 86: Shelters separated by centimetres, with no physical barrier between the public circulation space and the shelter in Kutupalong.
Source: Sorin Furcoi, 2023.



Fig. 87: Interior of a standard shelter in Kutupalong consisting of a single undivided space.
Source: Saikat Mojumder, 2022.

The modular planning standard applies only partially in Camp 9. As Goodwin described, the UNHCR’s approach consisted of introducing spatial order into an organically developed landscape after the establishment of the camp: constructing access roads, designating zones for community facilities and evacuating families from the most dangerous areas.¹³⁴ The main roads do now resemble the organised network from the Handbook to some

extent. Nevertheless, at the level of the individual shelter units, no blocks or clusters as defined by the standards in the Handbook are recognisable. Instead, the shelter arrangements appear to follow the contours of the hill slopes which results in circular clusters, random orientations and no trace of the rectangular block structure prescribed by the Handbook. The only recognisable structure is the network of access roads running between them.



Fig. 88: The wider access routes that UNHCR added at a later stage can be seen as sandy paths cutting straight through the maze of shelters.
Source: Google Earth, 2019.



Fig. 89: The shelters follow the contours of the sandy hills where forests once stood.
Source: Ingebjørg Kårstad, 2019.

¹³³ UNHCR, “Rohingya refugees lead response to fire threat in Bangladesh camps.”

¹³⁴ Phoebe Goodwin, interview by author, March, 18, 2026.

2.3.4 Pillar II: Context Around the Shelter

Unlike Kalobeyei, where the context standards could be applied because the infrastructure had already been constructed before the refugees arrived in large numbers, the spatial context of Camp 9 reflects the same spontaneous growth that shaped the shelter units. Since the camp was established without planning, there was no framework in which the standards from the Handbook for the context of the camp could be applied. The standards were not ignored, they simply could not be implemented in a landscape that was already fully occupied before any spatial planning could be established.

The standard of 45 m² of total floor area per person is not fulfilled in Camp 9. The Shelter Projects report confirms that the building density in the settlement varied between 9 and 15 m² per person,¹³⁵ which is only a fraction of the total floor area standard of the Handbook.

The camp does also not meet the standard for hierarchical layout as the spatial organisation of the camp is based on the organic logic of a spontaneous settlement rather than the hierarchical cluster-block-sector structure prescribed by the Handbook.

The standard requiring firebreaks of 30 m every 300 m is not followed in Camp 9. Kuligowski et al. confirm that the absence of effective firebreaks, combined with the high flammability of bamboo and plastic sheeting and the use of fencing, created a built environment that reinforced the spread of the fire rather than containing it.¹³⁶ The minimum distance of two metres between shelters is also not fulfilled in the most densely populated parts of the camp. These are the two spatial standards specifically designed to prevent the disaster that occurred in March 2021. The combined lack of these standards was not a mistake, but a structural consequence of a settlement that was never designed according to these standards in the first place.

In Camp 9, the requirement that the infrastructure must follow the topography is not fulfilled either. Although the shelters do follow the contour of the hills, this is not the result of a planning decision, as mentioned in 2.3.3, families occupied every available space on the site upon their arrival, including flood-prone valleys and unstable slopes.

2.3.5 Pillar III: Management

The management of Camp 9 is defined by a tension between the standards of the *Emergency Handbook* and the political realities of camp management. The Handbook prescribes an open, accessible camp in which aid workers can move freely and residents can be evacuated quickly.¹³⁷ The actual management of Camp 9 takes place within a framework dictated by the Bangladeshi authorities, who in 2020 rapidly constructed more than 28 km of barbed-wire fencing around at least 25 connected refugee camps in Kutupalong, including Camp 9. The authorities stated that this measure was driven by security concerns and

the desire to control the movements of the Rohingya in and out of the camps.¹³⁸ International humanitarian aid workers operational in Kutupalong reported that “the fencing will further restrict their work in the refugee camps, impeding Rohingya and local Bangladeshi populations from accessing medical facilities, medicines, and healthcare”.¹³⁹ As Kuligowski et al. confirmed, combined with the extreme density of the shelters and the narrow width of the paths, this fence created a physical environment that, during the fire in March 2021, acted as an obstacle for evacuation rather than a safety barrier.¹⁴⁰



Fig. 90: Construction of barbed-wire fencing in Kutupalong Expansion Camp.
Source: Fortify Rights, 2020.



Fig. 91: The barbed-wire fence leaves a distance of approximately one metre between the shelter wall and the barrier to pass through.
Source: Private, 2020.

¹³⁵ Shelters Projects 9th edition, “Fire Response Bangladesh,” 93.

¹³⁶ Kuligowski et al. “Simulating Evacuation of Humanitarian Settlements,” 1328.

¹³⁷ UNHCR, “UNHCR Emergency Handbook: Settlement Typologies in Emergencies.”

¹³⁸ Fortify Rights, “Bangladesh: Remove Fencing That Confines Rohingya to Refugee Camps.”

¹³⁹ Fortify Rights, “Bangladesh: Remove Fencing That Confines Rohingya to Refugee Camps.”

¹⁴⁰ Kuligowski et al. “Simulating Evacuation of Humanitarian Settlements,” 1331.

In Camp 9, the standard for open access of public routes is not achieved. The density of the settlement and the organic logic of the spatial layout have resulted in a network of paths characterised by narrow, uneven and often blocked routes that are inaccessible for emergency vehicles and during the monsoon season, when the paths turn into waterways, are barely walkable. The construction of access roads after the spontaneous settlement was established, resulted in a road network that was wider than the informally constructed paths. Yet, it still fell below the standard for emergency access and evacuation routes prescribed by the Handbook. The consequences of this deficiency became immediately visible during the fire in March 2021. According to the UNHCR's report on emergency response, refugee volunteers were the main first responders, taking action to extinguish the fire, create firebreaks and bring vulnerable residents to safety until the national fire service could arrive, which could take over an hour.¹⁴¹

Furthermore, the standard for the alignment of the grid infrastructure is also not met. The access infrastructure added afterwards has resulted in a spatial structure within an organically settled landscape that is neither a grid nor a cohesive alternative to one. The

access roads follow the topographical logic of the hilltops and valley floors, creating a network that, when viewed from above, reads as a pattern of lines connecting key points, but which does not replicate the hierarchical structure of the modular planning approach of the Handbook at the scale of the residential clusters as mentioned in 2.3.4 Pillar II.

The standard maximum of 20,000 people per shelter unit is exceeded to such an extent that a comparison with the standard from the Handbook is virtually meaningless. Camp 9 alone, one of the 34 camps in Kutupalong, currently houses more than 46,000 registered persons, more than twice the standard maximum. The entire Kutupalong camp, consisting of the registered camps, the unregistered camps and the camp extension, accommodates in April 2026 over 1,190,000 registered Rohingya refugees in a location that was never designed, planned or spatially managed as a single settlement unit.¹⁴² As discussed in Chapter I, the standard of 20,000 people per settlement unit is both a technical specification and an acknowledgement of the limitations of the Handbook's modular management model, a model that was never designed to function at the scale that Kutupalong Camp represents.

In large parts of Camp 9, the requirement for a water point to be within 500 m is not fulfilled. Due to the population density and the geographical fragmentation of the terrain, where hills and valleys form natural barriers that increase the actual walking distances, many households are located at a distance from water points that far exceeds the standard. The progressive expansion of the settlement into areas beyond the reach of the original water supply infrastructure has worsened this problem over time. The pressure on the available water facilities is extreme, as one resident of the camp described "Our three blocks completely depend on this well, another nearby has dried up already."¹⁴³

The standard requiring healthcare facilities to be accessible within a radius of 5 km is partially fulfilled in Kutupalong. Within the prescribed distance, there are several health posts and medical facilities managed by the UNHCR, Médecins Sans Frontières and other partner organisations, which serve the camp's residents.¹⁴⁴ However, the physical proximity of a health facility, measured in kilometres, doesn't translate into accessible healthcare when the facility's capacity is overwhelmed by a population many times larger than that for which it was designed.



Fig. 92: Refugees collecting water at a water point in Kutupalong.

Source: Minority Rights Group, 2023.



Fig. 93: Clinic in Camp 9.

Source: Haefa, 2017.

¹⁴¹ Shelters Projects 9th edition, "Fire Response Bangladesh," p 93.

¹⁴² UNHCR, "Rohingya refugee population dashboard, 30 April 2026."

¹⁴³ ABC News, "Hundreds of thousands of Rohingya refugees face water shortage crisis as wells run dry."

¹⁴⁴ MSF, "Cox's Bazar, Bangladesh: Fire destroys Rohingya refugee shelters and MSF clinic."

SHELTER

3,5m ² /person (warm climates)	✗
min. 2m height at lowest point (warm climate)	◐
4,5 - 5,5m ² /person (cold climates)	N/A
5 persons per shelter unit	✗
lockable doors and secure access	✗
internal partitioning	✗
use of appropriate shelter materials	✗
socio-economic space for assets and livelihoods	✗
modular planning	◐

CONTEXT AROUND THE SHELTER

45m ² /person (total area: shelter + context)	✗
hierarchical layout	✗
logistical zones	✗
plot ratio 1:2 to 1:5	✗
30m firebreaks every 300m	✗
max. 50m distance to nearest cluster neighbour	✓
min. 2m between shelters	✗
infrastructure must follow topography	✗

MANAGEMENT

open access of public routes	✗
grid-infrastructure alignment	✗
max. 20000 persons/settlement unit	✗
45m ² total land area	✗
max. 500m to water point	✗
max. 5km to clinics	◐
road safety management	✗

Fig. 94: Comparative matrix of the three pillars of the *UNHCR Emergency Handbook* - shelter, context around the shelter and management - applied to Kutupalong Camp 9, Bangladesh.
Source: Author, based on the digital *UNHCR Emergency Handbook*.

2.4 Interim Conclusion

PILLAR	KARA TEPE 2 (Greece)	KALOBYEI (Kenya)	KUTUPALONG CAMP 9 (Bangladesh)
SHELTER	◐	◐	✗
CONTEXT AROUND THE SHELTER	✓	✓	✗
MANAGEMENT	✓	◐	✗

Fig. 95: General overview matrix of the three pillars in the three case studies.
Source: Author, 2026.

The comparative matrix of the three case studies shows that the process of universalisation promoted by the digital *Emergency Handbook* does not lead to the spatial uniformity it claims to achieve. As the overview matrix above illustrates, each case shows a different level of fulfilment. Some apply the guidelines partially, whilst others fail to do so at all. In every instance, the reason for the difference is not determined by the Handbook itself, but by the specific geographical, political and demographic conditions that the 'ideal model' has to deal with.

Kara Tepe 2 meets most of the standards, but the analysis shows that this fulfilment is not due to the spatial framework of the Handbook itself,

but to an exceptional combination of factors: a military site that functions as a tabula rasa, emergency funding from the EU and a population kept below the maximum of 20.000 refugees by the Greek government. Where the numbers are correct, the spatial quality is not: meeting the standard does not guarantee quality.

In Kalobeyei, a unique collaboration between various organisations resulted in prototype shelters that go beyond the usual plastic sheet tents, but the structural framework of the Handbook - the grid, the hierarchy of cluster blocks, the minimum floor area of 3,5 m² - remained the essential framework. The prototype initiative remained a limited spatial experiment, because the

majority of the residents continued to live in standard humanitarian shelters.

In Kutupalong Camp 9, the 'ideal model' has not failed, but has become structurally meaningless. The spontaneous settlement of hundreds of thousands of Rohingya refugees on a complex hilly terrain happened before any kind of spatial planning took place. The consequences of this became clear during the fire in March 2021, when the lack of firebreaks, the extreme density of the shelters and the barbed-wire fences installed by the Bangladeshi authorities

turned the camp into a spatial trap rather than a managed settlement. The maximum capacity of 20.000 people is exceeded by a factor of more than sixty across the entire camp.

Altogether, the three cases reveal a consistent structural pattern: the gap between the 'ideal model' and the reality takes a different form in each context, but is present in all cases. The UNHCR does not design environments that respond to their context, but rather applies a universal framework to that context, with the resulting limitations being felt by the people who live there.

Reflection

Spatial Agency: How Refugees Reclaim their Space

The *UNHCR Emergency Handbook* prescribes a fixed spatial layout: identical clusters, standardised distances and a hierarchical grid designed with logistics and management in mind. Yet, in every camp examined in this thesis, residents repeatedly go beyond the spatial plan they've been given. This part looks at the specific ways in which residents reclaim, adapt and transform the space designed by the UNHCR, as well as what these acts of reclaiming reveal about the relationship between the spatial standards and the people who have to live in them.

The most radical way in which residents reclaim the space is by breaking away from the rigid spatial layout. As Goodwin explained in the interview, camps often grow spontaneously.¹⁴⁵ Even when the UNHCR designs a strict masterplan with fixed shelter blocks in advance, this grid layout is often ignored or violated in practice. Residents group their dwellings according to their own personal and

cultural preferences - often in circular clusters - thereby creating social clusters and private courtyards that are not provided by the rectangular geometry of the Handbook. Abu-Aridah and Henn's research into the Zaatari camp in Jordan documents this process in detail: residents physically break through the prescribed grid to reorganise their immediate surroundings into spatial arrangements that reflect social networks, shared origins and the cultural practices of community life.¹⁴⁶ The UNHCR designs for logistics, residents redesign for the community.

In Kara Tepe 2, spatial agency is the most limited out of the three cases. The prefabricated ISO-box containers that define the physical reality of the camp are, in terms of their design, architecturally immovable: they can't be expanded, adapted or converted. While the standard plastic sheet tent used to allow residents to add awnings, take over neighbouring spaces and build informal extensions, the rigid container

¹⁴⁵ Phoebe Goodwin, interview by author, April, 24, 2026.

¹⁴⁶ Abu-Aridah and Henn, "Construction 4.0 in Refugee Camps," 7 - 14.

completely rules out these possibilities. As Den Duijf notes, expanding one's own shelter is often one of the first things people do after settling in¹⁴⁷ - an instinctive expression of domestic agency that is structurally prevented by the fixed boundaries of the container. The narrow, open corridors between the units offer no semi-private space. The permanently supervised paths and the fixed entrances of the containers leave no spatial boundary between public and private where small-scale trade, repair work or social gatherings can take place without being immediately visible to the camp authorities. Nur Osso and Van Houtem describe this situation as 'hypervisibility' in which the spatial logic of the camp keeps residents permanently visible.¹⁴⁸ Yet the residents persevere: a sail stretched between two containers becomes an improvised shade terrace, a reused bed frame in the corridor becomes a communal seating area (see fig. 41), clothes hung on ropes stretched across the space create a sense of separation within the single, undivided space. These are not aesthetic choices, but spatial interventions that individually represent a small claim to a more domestic life, which the container's design explicitly fails to provide.

In Kalobeyei, spatial agency was not

only accepted by the designers, but intentionally included as a design approach in the concept for the prototype shelters. Shigeru Ban's three housing types - the Paper Tube House, the Timber Frame House and the CEB House - were explicitly designed as simple, repeatable structures that residents could maintain, adapt and extend without specialist knowledge or dependence on external supply chains. The use of locally available materials, particularly the compressed earth blocks and the cladding of paper tubes, transfers construction knowledge to the residents themselves, creating a form of spatial autonomy. This represents a different approach to spatial agency than what was observed in Kara Tepe 2. Instead of agency being applied after the design was made, it was integrated into the design as a guiding ambition. The absence of internal partition walls, which was seen as a weakness during the prototype presentations can be read as an intentional choice: by leaving the interior undivided, the design invites the residents to organise the space themselves according to their own needs. In that sense, Kalobeyei represents the most architecturally considered attempt to make spatial agency understandable as a design concept, treating the reclaiming of

spaces not as a violation of the standard, but as a way to build upon it.

Yet the most visible example of spatial agency in Kalobeyei did not result from the prototype shelters at all, it came entirely from outside the design framework. Through a cash-based intervention programme run by the UNHCR, refugees received monthly financial support that was deposited directly into their personal bank accounts. Many used this money to renovate their temporary shelters themselves. Kika, a refugee from the Democratic Republic of Congo, spent three years in a standard plastic sheeting shelter before using her cash allowance to transform it into a permanent brick house, built in less than two weeks with the help of experienced masons from both the refugee and host communities, characterised by a bright blue door, windows and an extended veranda of her own choosing.¹⁴⁹

In Kutupalong Camp 9, the reclaiming of space takes a completely different form from the two previous cases. In Kara Tepe 2, residents reclaim space against a strict design that actively prevents adaptation. In Kalobeyei, resident input is an integral part of the design. In Kutupalong, there was never

an enforced spatial order to resist in the first place: the camp was built by the residents themselves before any planning framework existed. In that way, the spontaneous settlement on the hills, with families building their own shelters of bamboo and plastic sheeting along the contours of the landscape, digging into the earth to create paths and building walkways between the shelters, was not a reclaiming but a starting point. Here, spatial agency came before the institutional response, rather than reacting to it.

Yet within that organically populated landscape, there are visible signs of reclaiming. Throughout the camp, residents built informal markets out of bamboo poles and plastic sheeting, with some store owners laying concrete floors to create more permanent commercial spaces.¹⁵⁰ People dug earth to build steps into the hillside, gathered firewood, set up small shops and organised daily life through a network of self-built structures¹⁵¹, all beyond any spatial standard prescribed by the Handbook. Bamboo, a traditional building material in Rohingya culture, became the primary resource for both construction and repair, with residents constantly rebuilding and reinforcing

¹⁴⁷ Den Duijf, *Dignified Displacement*, 14.

¹⁴⁸ Nur Osso and van Houtem, "Now You See Me," 731-754.

¹⁴⁹ UN Sustainable Development Group, "Home at last: For Refugees in Kenya, moving from temporary shelter to newly built houses makes a world of difference."

¹⁵⁰ Hoque, "Marketplace Dynamics and Informal Livelihoods in Rohingya Camps."

¹⁵¹ Battiston, "The city of the Rohingya."

their shelters in response to monsoon rains, flooding and fire.

The true strength of this spatial agency became clear during the fire in March 2021. For over an hour, it was refugee volunteers and not the official fire service who were the first to arrive on the scene. They fought the flames, created improvised firebreaks and brought residents to safety.¹⁵² They found their way through a complex terrain based on their memory, a reality that the UNHCR could never have mapped out. Only the community knew which paths were passable and where vulnerable neighbours lived. In Kutupalong, spatial action was not about creating a home. The focus was purely on survival.

In all three cases, a consistent pattern becomes apparent. The 'ideal model' provides a space designed for management, while residents transform it into a space designed for living. As Kennedy observed, treating a camp as a fixed technical drawing overlooks the way a settlement develops naturally through social zones, informal markets and the spatial decisions of the people who live there. Every act of spatial reclaiming is evidence of the gap between the space prescribed by the Handbook and the space people need.

The Paradox of Care vs. Control

The spatial agency described in the previous chapter does not exist in a neutral environment. It is exercised within a spatial system that is designed to both protect and control, but is always in tension with that system. As Michael Barnett argues, contemporary humanitarianism is no longer just a matter of aid provision, it is also an act of power that manages populations through structured spatial frameworks.¹⁵³ Michel Agier puts this even more precisely, he argues that in refugee camps "there is no care without control"¹⁵⁴. The standards that guarantee minimum living conditions are the same standards that make every movement within the camp permanently visible to the authorities that manage it. This is not a coincidental feature of the Handbook's design, it is intentional.

At the level of the shelter, the minimum floor area of 3,5 m² per person defines both the humanitarian standard that the camp must meet and the spatial density that keeps the camp logistically and administratively manageable. At the level of the shelter's context, the 30 m wide firebreaks and the required

2 m distances between shelters serve both as fire safety measures and as surveillance corridors. At the level of management, the requirement for open, accessible public routes results in a camp environment in which straight paths eliminate blind spots, the hierarchical layout provides uninterrupted sightlines and every act of spatial reclaiming becomes immediately visible. As Mutai confirmed, the construction of a wall by a resident is not just a domestic act, it is a spatial challenge to the logic of visibility on which the management of the camp is based.¹⁵⁵

In Kara Tepe 2, the paradox is further intensified by the conflict between two institutional logics: the humanitarian framework of the *UNHCR Handbook* and the security system of the European Union's border management framework. The Handbook prescribes open, accessible settlements, while the EU's security logic surrounds the camp with barbed wire and restricts the residents' freedom of movement. The prefabricated containers that replaced the improvised tents of Moria were presented as an improvement in living conditions, which they were in

¹⁵² Shelters Projects 9th edition, "Fire Response Bangladesh," 93.

¹⁵³ Barnett, *Empire of Humanity: A History of Humanitarianism*, 221.

¹⁵⁴ Agier, *Managing the Undesirables*, 4.

¹⁵⁵ Patrick Mutai, interview by author, March, 24, 2026.

several ways, but at the same time they introduced a more strict architectural form of control. The tent, no matter how deficient, could be adapted, extended and reorganised, but the container cannot. The improvement in material quality sacrificed spatial autonomy. The camp became more liveable in terms of standards, but less flexible in practice.

In Kalobeyei, the paradox between care and control is captured in the ambition of the integrated settlement model. The project's goal was to move beyond isolation and create a model of shared urban life in which care no longer required control, where refugees and the host community would use the same markets, schools and public spaces as equals. However, the analysis revealed that the technical framework of the Handbook still served as the structural basis that no architectural ambition could fully transcend. The public spaces designed to connect refugees and the host community remained, as Mukanga et al. confirmed, isolated islands rather than genuine urban connections.¹⁵⁶

Kutupalong is where this paradox is most tragically apparent. The barbed-wire fence that the Bangladeshi authorities constructed in 2020 was described as a safety measure intended to protect local residents. However, for the residents of Camp 9, it was the fence that turned

the March 2021 fire from a disaster into a catastrophe. As Kuligowski et al. document, the fencing that was installed to control the movements of the Rohingya population turned the camp into a spatial trap: evacuation routes were blocked, emergency vehicles could not reach the burning shelters and residents were forced to make their way through a maze of barbed wire and narrow paths in an environment that was on fire. The structure of care and the structure of control were, at that moment, physically one and the same, costing people their lives.

The paradox between care and control reveals something that the Handbook can't fix with better standards or a more thoughtful design. The refugee camp is the spatial expression of a political failure: the failure to deal with the conditions that lead to displacement in the first place. The standards established in 1982 as temporary minimum standards for survival have become the permanent spatial reality for millions of people living in what this thesis describes as a permanent system of temporary housing. The 3,5 m² that was considered hardly acceptable for an emergency situation has, for many residents, become the spatial reality for years or decades. The residents who claim that space - by stretching

out a tarpaulin, building a wall, carving out a courtyard from the grid - do not violate the logic of the Handbook. They complete it. They do what the Handbook can't do: transform a controlled space into a place.

¹⁵⁶ Mukanga et al., "From Kibera to Kalobeyei," 311-320.

Conclusion

The architect is usually visible. There is a name on the drawings, a signature on the contract, a face behind the design. This thesis has identified a form of architectural authority that functions without any of these, one that shapes the physical reality of millions of people whilst remaining structurally invisible. The thesis has argued that refugee camps represent a radically different form of architecture: one that is anonymous, universal and prescribed. The physical reality of millions of displaced people across the globe is not the result of local design decisions, site-specific solutions or community input. It is the result of a single document: the *UNHCR Emergency Handbook*.

This thesis began with a controversial statement, namely that the UNHCR is not primarily known as an architectural organisation. It is known as a humanitarian organisation, an agency that protects, assists and represents the rights of the world's most vulnerable populations. Yet the research presented here has shown that the organisation also fulfils a very different function: that of a global spatial authority which prescribes the physical layout of refugee camps worldwide through a system of universal technical standards.

Every road, every tent, every firebreak, every water point - everything is laid down in advance at the headquarters in Geneva and applied with the same geometry, whether the landscape is a military coastal zone on a Greek island, a semi-arid plain in northern Kenya or a densely forested hill in south-eastern Bangladesh.

It is only now, having traced this process through its historical origins, its technical logic, its digital institutionalisation and its practical consequences that this thesis introduces the term: the invisible architect. The *UNHCR Emergency Handbook* is not a neutral reference tool, it is the invisible architect. It is an agency whose spatial influence has been intentionally depersonalised, hidden behind the bureaucratic language of technical standards and humanitarian emergency, yet whose decisions affect the daily lives of more than 136 million forcibly displaced people. This thesis aims to make this invisible architect visible.

Chapter I discussed the theoretical and technical foundations of this argument. It described how the UNHCR evolved from a temporary post-war organisation into a permanent global authority,

which Loescher describes as a 'teacher of refugee standards' and which Kagan characterises as a 'surrogate state'. Due to its influential position, the organisation was able to implement strict standards worldwide without ever visiting the sites or listening to the people who lived there. The *Emergency Handbook*, first published in 1982, was not the result of architectural research or empirical design. The standards are based on three historical approaches that have never been scientifically proven: military spatial logic, 19th-century sanitation engineering and improvised field practice, documented during emergencies. The minimum of 3,5 m² per person in warm climates - the Handbook's most controversial standard - was not intended to provide a dignified life. It was a survival minimum, barely distinguishable from the transit standard of 3 m², which the Handbook itself considers acceptable for only three to five days.

The crucial turning point mentioned in Chapter I is the digitalisation of the Handbook in 2015. By transforming a static printed document into a permanently accessible digital platform, the UNHCR formalised its spatial standards as a standardised script: a universally applicable set of guidelines which, in theory, should result in the same spatial result in any context

worldwide regardless of the landscape. This claim to universality became the central hypothesis tested in Chapter II.

In Chapter II, this hypothesis was tested using three case studies representing fundamentally different realities. The results were very clear: the standardisation that the digital Handbook was intended to achieve does not lead to spatial uniformity. At Kara Tepe 2, the standards are formally met, but there is no spatial suitability. In Kalobeyei, even the most architecturally ambitious attempt to rise above the 'ideal model' could not overcome its structural limitations. In Kutupalong, the model did not fail, but became structurally irrelevant before it could even be applied. Three different contexts, three different forms of failure - but in each case, the gap between the space prescribed in the Handbook and the space that people actually occupy is structural, not a coincidence. The invisible architect designs the same camp everywhere, the blueprint is what does not fit the world.

The hypothesis of the invisible architect, introduced in this conclusion but present throughout the logic of this research, reveals something that a technical review of the Handbook alone is unable to: the tension between the authority that designs and the people who live there. The invisible architect

does not design for a specific person, a specific family, a specific community or a specific landscape. Instead, this architect designs for a certain group - 'the refugee' - and applies that design everywhere, as if that group alone were enough to define the space. The three pillars of the 'ideal model' are not spatial solutions to human needs, but rather spatial reflections of institutional logic: the need for speed, uniformity, simplicity and control. As Agier argues and as the three case studies have confirmed, there is no care without control. The standards that define minimum living conditions are the same standards that make every movement within the camp permanently visible. The firebreak that protects is the same firebreak that supervises. The road that enables access is the same road that enables observation.

The reflection has revealed that residents do not simply accept the space designed for them by the invisible architect. In all the case studies, they reclaim the space. In Kara Tepe 2, this works against the design: a sail stretched between containers, a bed frame repurposed as a communal seating area, clothes hung on ropes to create a partition where the architecture fails to provide one. In Kalobeyei, it works through the design: Ban's undivided interior spaces invite residents to organise

their own space. In Kutupalong, spatial reclaiming happened before the design: The organic layout on the hilly slopes, the bamboo stairways carved into the hillside, the informal markets built from bamboo poles and plastic sheeting and the first response of the community itself to the fire are all examples of spatial knowledge that the Handbook cannot describe and the invisible architect does not see.

This is the fundamental paradox that this thesis has brought to light. The invisible architect designs a space that is managed, residents transform that space into a space that is lived in. The tension between the two is not a failure in the implementation, but it is a structural problem. It is the result of applying a universal blueprint to a unique world.

A final reflection

Refugee camps are often described as a temporary solution to a temporary problem. This thesis has shown that they are neither. The standards established in 1982 as emergency minimums have become the permanent spatial reality for millions of people living in what this research describes as a permanent system of temporary housing. The average displaced person, as the UNHCR itself recognizes, lives in displacement for more than sixteen years. The 3,5

m² that was barely acceptable for an emergency situation has, for many, become the spatial reality for a decade or longer.

The invisible architect did not intend it this way. The *UNHCR Emergency Handbook* was designed for a crisis that would eventually come to an end. But the crisis is not ending and the Handbook has not evolved with the changes in the world. The digital platform launched in 2015 made the standards more accessible, more direct and more universal than ever before. However, it did not make them more human, more contextual or better adapted to the people who have to live with them.

The thesis does not argue that the Handbook should be set aside or that the UNHCR's spatial authority is inappropriate. It argues that this

authority must be made visible, because invisible power is power for which no responsibility is accounted for. Every spatial decision in the Handbook is, as Kennedy noted, essentially an architectural choice and every architectural choice has consequences for the people who must live with it. The invisible architect will continue to design refugee camps for as long as displacement remains a reality. The question this thesis leaves open is whether those camps can be designed not only for the category of 'the refugee', but also for the people who actually live there: the mother who hangs clothes on a rope to create a room, the family building a stone house with a blue door, the volunteer who knows every path on the hill because she lives there. Making the invisible architect visible is the first step. Designing with, rather than for, the people who find shelter in these camps is the next step.

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Fig. 43. A firefighter attempts to control the fire at the Moria camp on September 8 2020. The plastic sheeting is visibly melting due to the heat.

The Conversation, Fire destroys Moria refugee camp: another tragic wake-up call for the EU's asylum policy. Photograph by Orestis Panagiotou. Accessed May 21, 2026. <https://theconversation.com/fire-destroys-moria-refugee-camp-another-tragic-wake-up-call-for-the-eus-asylum-policy-145899>.

Fig. 44. View on Kara Tepe 2 in 2024.

RSA, Lesvos. Photographed by RSA. <https://rsaegean.org/en/lesvos-2024/>.

Fig. 45. The fence around Kara Tepe 2, finished off with barbed wire.

Toscano, Javier, and Muhammad Ali, The Lesvos limbo: A visual memory from the periphery of Europe. Photograph by Muhammad Ali. Accessed May 22, 2026. <https://anthrosource.onlinelibrary.wiley.com/doi/abs/10.1111/var.70005>.

Fig. 46. The access gate of Kara Tepe 2, with ISO-box containers visible in the background.

Toscano, Javier, and Muhammad Ali, The Lesvos limbo: A visual memory from the periphery of Europe. Photograph by Muhammad Ali. Accessed May 22, 2026. <https://anthrosource.onlinelibrary.wiley.com/doi/abs/10.1111/var.70005>.

Fig. 47. Residents of Kara Tepe 2 waiting along the fence in Kara Tepe 2. The long queue and lack of seating show the difficult conditions for getting transport to Mytilene.

Google Earth, *Satellite view of Kara Tepe 2*. Satellite image, 2023. Accessed May 20, 2026. <https://earth.google.com>.

Fig. 48. The only bus route authorised to pick up residents of Kara Tepe 2, photographed from the bus stop next to the fence.

Toscano, Javier, and Muhammad Ali, The Lesvos limbo: A visual memory from the periphery of Europe. Photograph by Muhammad Ali. Accessed May 22, 2026. <https://anthrosource.onlinelibrary.wiley.com/doi/abs/10.1111/var.70005>.

Fig. 49. Comparative matrix of the three pillars of the UNHCR Emergency Handbook - shelter, context around the shelter and management - applied to Kara Tepe 2, Greece.

Matrix by author.

Fig. 50. Satellite view of Kalobeyei camp in Kenya.

Google Earth, *Satellite view of Kalobeyei*. Satellite image, 2024. Accessed May 20, 2026. <https://earth.google.com>.

Fig. 51. Rows of standard UNHCR family tents in the new Kalobeyei settlement, showing the grid layout that dominated the site prior to the construction of the VAN prototype shelters.

Quartz, A minimalist Japanese architect is designing homes for refugees that they can build themselves. Photograph by Lily Kuo. Accessed May 26, 2026. <https://qz.com/africa/1036808/a-minimalist-japanese-architect-is-designing-housing-for-refugees-in-kenya-that-they-can-build-themselves>.

Fig. 52. Groundplan of the Paper Tube House.

Monteil, Philippe, *Turkana Houses*. (UN-Habitat, 2020), p 86-87. Plan by Shigeru Ban Architects. Accessed May 2, 2026. <https://unhabitat.org/turkana-houses>.

Fig. 53. Shigeru Ban's sketch of Type A.

Monteil, Philippe, *Turkana Houses*. (UN-Habitat, 2020), p 9. Sketch by Shigeru Ban Architects. Accessed May 2, 2026. <https://unhabitat.org/turkana-houses>.

Fig. 54. Type A section AA + detail related to section AA.

Monteil, Philippe, *Turkana Houses*. (UN-Habitat, 2020), p 110-111. Plan by Shigeru Ban Architects. Accessed May 2, 2026. <https://unhabitat.org/turkana-houses>.

Fig. 55. Type A elevation short side + detail roof structure.

Monteil, Philippe, *Turkana Houses*. (UN-Habitat, 2020), p 112-113. Plan by Shigeru Ban Architects. Accessed May 2, 2026. <https://unhabitat.org/turkana-houses>.

Fig. 56. Assembly of paper tube columns and beams.

Shigeru Ban Architects, Prototype Constructions. Photograph by Shigeru Ban Architects. Accessed May 2, 2026. <https://shigerubanarchitects.com/works/paper-tubes/kenya/>.

Fig. 57. Women weaving the wall.

Shigeru Ban Architects, Prototype Constructions. Photograph by Shigeru Ban Architects. Accessed May 2, 2026. <https://shigerubanarchitects.com/works/paper-tubes/kenya/>.

Fig. 58. Completion of Type A.

Shigeru Ban Architects, Prototype Constructions. Photograph by Shigeru Ban Architects. Accessed May 2, 2026. <https://shigerubanarchitects.com/works/paper-tubes/kenya/>.

Fig. 59. Groundplan of the Timber Structure House.

Monteil, Philippe, *Turkana Houses*. (UN-Habitat, 2020), p 88-89. Plan by Shigeru Ban Architects. Accessed May 2, 2026. <https://unhabitat.org/turkana-houses>.

Fig. 60. Shigeru Ban's sketch for Type B.

Monteil, Philippe, *Turkana Houses*. (UN-Habitat, 2020), p 68-69. Sketch by Shigeru Ban Architects. Accessed May 2, 2026. <https://unhabitat.org/turkana-houses>.

Fig. 61. Type B section AA + roof plan.

Monteil, Philippe, *Turkana Houses*. (UN-Habitat, 2020), p 114-115. Plan by Shigeru Ban Architects. Accessed May 2, 2026. <https://unhabitat.org/turkana-houses>.

Fig. 62. Type B bracing system.

Monteil, Philippe, *Turkana Houses*. (UN-Habitat, 2020), p 116-117. Plan by Shigeru Ban Architects. Accessed May 2, 2026. <https://unhabitat.org/turkana-houses>.

Fig. 63. Completion of timber framework.

Shigeru Ban Architects, Prototype Constructions. Photograph by Shigeru Ban Architects. Accessed May 2, 2026. <https://shigerubanarchitects.com/works/paper-tubes/kenya/>.

Fig. 64. Brickwork to infill the frame.

Shigeru Ban Architects, Prototype Constructions. Photograph by Shigeru Ban Architects. Accessed May 2, 2026. <https://shigerubanarchitects.com/works/paper-tubes/kenya/>.

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Shigeru Ban Architects, Prototype Constructions. Photograph by Shigeru Ban Architects. Accessed May 2, 2026. <https://shigerubanarchitects.com/works/paper-tubes/kenya/>.

Fig. 66. Groundplan of the CEB House.

Monteil, Philippe, *Turkana Houses*. (UN-Habitat, 2020), p 90-91. Plan by Shigeru Ban Architects. Accessed May 2, 2026. <https://unhabitat.org/turkana-houses>.

Fig. 67. Shigeru Ban's sketch for Type C.

Monteil, Philippe, *Turkana Houses*. (UN-Habitat, 2020), p 118-119. Plan by Shigeru Ban Architects. Accessed May 2, 2026. <https://unhabitat.org/turkana-houses>.

Fig. 68. Type C exploded view.

Monteil, Philippe, *Turkana Houses*. (UN-Habitat, 2020), p 74-75. Plan by Shigeru Ban Architects. Accessed May 2, 2026. <https://unhabitat.org/turkana-houses>.

Fig. 69. Stacking of compressed earth blocks.

Shigeru Ban Architects, Prototype Constructions. Photograph by Shigeru Ban Architects. Accessed May 2, 2026. <https://shigerubanarchitects.com/works/paper-tubes/kenya/>.

Fig. 70. Completion of Type C.

Shigeru Ban Architects, Prototype Constructions. Photograph by Shigeru Ban Architects. Accessed May 2, 2026. <https://shigerubanarchitects.com/works/paper-tubes/kenya/>.

Fig. 71. Types A + B + C

Shigeru Ban Architects, Site Visit. Photograph by Takeshi Kuno. Accessed May 2, 2026. <https://shigerubanarchitects.com/works/paper-tubes/kenya/>.

Fig. 72. Aerial view of the planned residential blocks in Kalobeyei.

Global Times, Kakuma refugee camp in Turkana County, Kenya. Photographed by Xinhua. Accessed March 18, 2026. <https://www.globaltimes.cn/page/202104/1220641.shtml>.

Fig. 73. Residential concept of Kalobeyei Camp.

UN-Habitat, *Kalobeyei Settlement Advisory Development Plan*, (UN-Habitat, 2018), p 147. Drawing by UN-Habitat. Accessed May 4, 2026. <https://unhabitat.org/kalobeyei-settlement-advisory-development-plan-turkana-county-kenya-final-draft>.

Fig. 74. Public space concept of Kalobeyei Camp.

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Fig. 75. Interconnected scales of spatial management.

UN-Habitat, *Kalobeyei Settlement Advisory Development Plan*, (UN-Habitat, 2018), p 135. Scheme by UN-Habitat. Accessed May 4, 2026. <https://unhabitat.org/kalobeyei-settlement-advisory-development-plan-turkana-county-kenya-final-draft>.

Fig. 76. Average walkable distance to water points.

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Fig. 77. Water point in Kalobeyei.

UN-Habitat, *Kalobeyei Settlement Advisory Development Plan*, (UN-Habitat, 2018), p 83. Photograph by UN-Habitat. Accessed May 4, 2026. <https://unhabitat.org/kalobeyei-settlement-advisory-development-plan-turkana-county-kenya-final-draft>.

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Standard Digital, Water shortage crisis hits Kalobeyei Settlement and Kakuma Refugee Camp. Photographed by Bakari Ang'ela. Accessed May 5, 2026. <https://www.facebook.com/standardkenya/posts/water-shortage-crisis-hits-kalobeyei-settlement-and-kakuma-refugee-camp-forcing-/1079045794265223/>.

Fig. 79. Comparative matrix of the three pillars of the UNHCR Emergency Handbook - shelter, context around the shelter and management - applied to Kalobeyei, Kenya.

Matrix by author.

Fig. 80. Satellite view of Kutupalong Extension camp 9 in Bangladesh.

Google Earth, *Satellite view of Kutupalong Extension camp 9 in Bangladesh*. Satellite image, 2024. Accessed May 8, 2026. <https://earth.google.com>.

Fig. 81. People search for their belongings after the fire burned down all the shelters in Camp 9.

The New Humanitarian, Rohingya camp fire. Photographed by RoYassin Abdumonab. Accessed June 1, 2026. <https://www.thenewhumanitarian.org/news/2021/03/23/rohingya-camp-fire-barbed-wire-fences-blocked-escape-witnesses-say>.

Fig. 82. A panoramic photograph of the destruction by the fire in Camp 9.

United Nations, UN teams assisting tens of thousands of refugees, after massive fire rips through camp in Bangladesh. Photograph by IOM Photo. Accessed June 1, 2026. <https://news.un.org/en/story/2021/03/1088012>.

Fig. 83. The terrain is undeveloped, no refugee camp is yet visible.

Google Earth, *Satellite view of Kutupalong Extension camp 9 in Bangladesh*. Satellite image, March 15, 2015. Accessed June 2, 2026. <https://earth.google.com>.

Fig. 84. Following the mass influx of Rohingya refugees, the site is in rapid expansion.

Google Earth, *Satellite view of Kutupalong Extension camp 9 in Bangladesh*. Satellite image, January 17, 2018. Accessed June 2, 2026. <https://earth.google.com>.

Fig. 85. The camp has reached its full development, housing 46.015 registered persons in Camp 9.

Google Earth, *Satellite view of Kutupalong Extension camp 9 in Bangladesh*. Satellite image, January 19, 2025. Accessed June 2, 2026. <https://earth.google.com>.

Fig. 86. Shelters separated by centimetres, with no physical barrier between the public circulation space and the shelter in Kutupalong.

Hussein, Mohammed, and Hanna Duggal. What is life like inside the world's biggest refugee camp?. Photographed by Sorin Furcoi. Accessed June 2, 2026. <https://www.aljazeera.com/news/longform/2023/8/25/what-is-life-like-inside-the-worlds-largest-refugee-camp>.

Fig. 87. Interior of a standard shelter in Kutupalong consisting of a single undivided space.

Artsen Zonder Grenzen, Vijf Jaar Rohingya in Bangladesh. Photographed by Saikat Mojumber. Accessed June 3, 2026. <https://www.msf-azg.be/nl/rohingya>.

Fig. 88. The wider access routes that UNHCR added at a later stage can be seen as sandy paths cutting straight through the maze of shelters.

Google Earth, *Satellite view of Kutupalong Extension camp 9 in Bangladesh*. Satellite image, April 7, 2019. Accessed June 2, 2026. <https://earth.google.com>.

Fig. 89. The shelters follow the contours of the sandy hills where forests once stood.

Norwegian Refugee Council. Trapped in the world's largest refugee camp. Photographed by Ingebjørg Kårstad. Accessed June 2, 2026. <http://nrc.no/perspectives/2019/trapped-in-the-worlds-largest-refugee-camp>.

Fig. 90. Construction of barbed-wire fencing in Kutupalong Expansion Camp.

Fortify Rights. Bangladesh: Remove Fencing That Confines Rohingya to Refugee Camps. Scheme by Fortify Rights. Accessed June 4, 2026. <https://www.fortifyrights.org/bgd-inv-2020-10-09-2/>.

Fig. 91. The barbed-wire fence leaves a distance of approximately one metre between the shelter wall and the barrier to pass through.

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Fig. 92. Refugees collecting water at a water point in Kutupalong.

Minority Rights Group. Bangladesh: Sanitation among Rohingya women in Kutupalong refugee camp. Photograph. Accessed June 2, 2026. <https://minorityrights.org/resources/trends2023-water-justice-and-the-struggles-of-minorities-and-indigenous-peoples-for-water-rights-a-planetary-perspective-9/>.

Fig. 93. Clinic in Camp 9.

Haefa. Rohingya Refugees. Photograph. Accessed June 3, 2026. <https://haefa.org/rohingya-refugees>.

Fig. 94. Comparative matrix of the three pillars of the UNHCR Emergency Handbook - shelter, context around the shelter and management - applied to Kutupalong Camp 9, Bangladesh.

Matrix by author.

Fig. 95. General overview matrix of the three pillars in the three case studies.

Matrix by author.



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