

**RESEARCH AND
DESIGN BOOKLET**
*CUADERNO DE
INVESTIGACIÓN Y DISEÑO*

HER OWN HOME
SU PROPIA CASA

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GRADUATION PROJECT

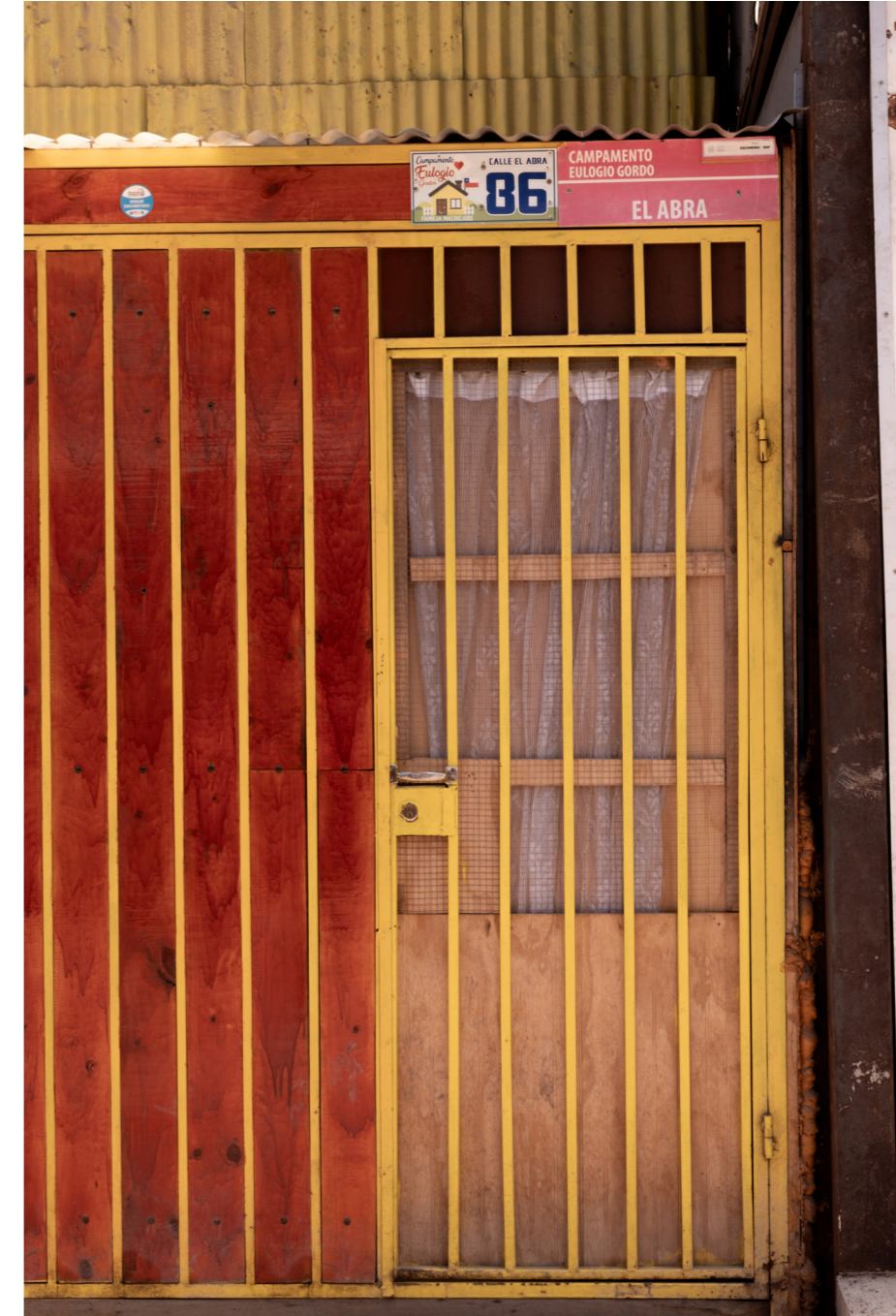
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La puerta que abre este booklet, en el pasaje Abra del Campamento Los Arenales. The door that opens this booklet, in the Abra street in the campamento Los Arenales.

2024 Julia García Sanjuán

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RESUMEN

El siguiente trabajo de investigación se adentra en el mundo del diseño paramétrico para conseguir una vivienda más inclusiva y social y medioambientalmente sostenible. A través de esta tecnología, el objetivo es desarrollar viviendas más adaptables y flexibles diseñadas para el contexto vulnerable del asentamiento informal de Los Arenales, situado en el árido paisaje de Antofagasta, en el norte de Chile. Dentro de esta comunidad, las mujeres desempeñan un papel vital, asumiendo el liderazgo en el funcionamiento y la gestión del asentamiento. Para fomentar un entorno vital más inclusivo, seguro y empoderador, se contempla el diseño desde una perspectiva feminista, celebrando la contribución única de estas poderosas mujeres. Todo valorando también la validez de los métodos de autoconstrucción como forma de crear ciudad y los derechos de los residentes a permanecer y asentarse en el lugar donde se encuentran sus casas y su comunidad. Además, esta investigación va más allá del mero examen de las necesidades de sus habitantes, en especial de las dichas mujeres, inmigrantes, niños y todos los grupos diferenciados para crear un entorno socialmente sostenible e integrador (software). También abarca una evaluación exhaustiva de la ubicación, el entorno, el inventario disponible de materiales de construcción y la calidad de la mano de obra (hardware). Este planteamiento está concebido para disuadir del desplazamiento y, en su lugar, fomentar una relación duradera y armoniosa entre los habitantes y su entorno, introduciendo al mismo tiempo soluciones sostenibles desde el punto de vista medioambiental. En términos generales, el diseño pretende proponer una solución de vivienda que incorpore una mezcla del software y hardware, explicados anteriormente, permitiendo la implantación de diversas tipologías adaptadas al usuario final.

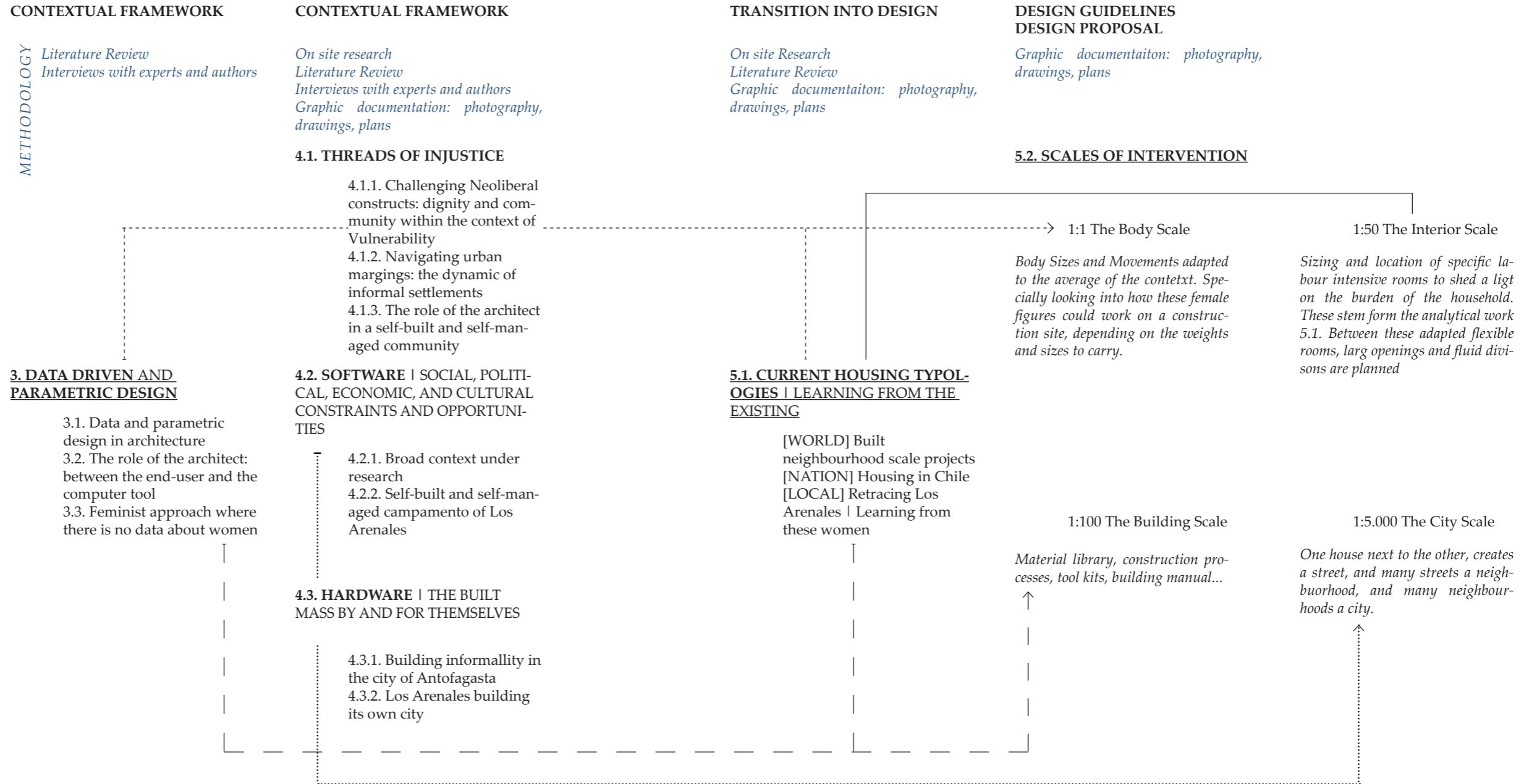
PALABRAS CLAVE: *paramétrico, informal, autoconstrucción, mujer, inclusivo, sostenible, adaptable, Los Arenales*

ABSTRACT

The following research paper delves into the intriguing world of parametric design to address more inclusive, social and environmentally sustainable housing. Through this technology the objective is to address more adaptable and flexible housing designed for the vulnerable context of the informal settlement of Los Arenales, situated in the arid landscape of Antofagasta in northern Chile. Within this community, women play a vital role, assuming leadership in the operation and management of the settlement. To foster a more inclusive, safe, and empowering living environment, meaning, looking into the design through a feminist perspective, while celebrating the unique contribution of these powerful women. This is undertaken while acknowledging the validity of self-built construction methods and the resident's rights to remain and settle where they current houses and community are. Furthermore, this research extends beyond merely examining the needs of its inhabitants, women, migrants, children, and all distinct groups to create a socially sustainable and inclusive environment (soft parameters). It also encompasses a comprehensive evaluation of the location, the surroundings, the available inventory of construction materials, and the quality of workmanship (hard parameters). This approach is designed to deter displacement and, instead, foster an enduring and harmonious relationship between the dwellers and their environment, while introducing environmentally sustainable solutions. In broad terms, the design aims to propose a housing solution that incorporates a blend of the previously explained soft and hard parameters, allowing for the implementation of diverse typologies tailored to the end-user.

KEYWORDS: *parametric, informal, self-built, mujer, inclusive, sustainable, adaptive, Los Arenales*

OUTLINE





I. INTRODUCTION

In the exploration of social housing, political and economic factors intersect with social and cultural contexts. It's essential to investigate not only the built mass categorized as "housing", but also the broader influences surrounding the context, the inhabitants, and the specific time-period during which this social housing project is conceived, constructed, and inhabited. The necessity to address multiple focal points simultaneously presents a significant challenge within the realm of architecture and the built environment, transcending spatial boundaries by encompassing all these mentioned considerations. Consequently, this multifaceted approach is the catalyst behind my research, which explores the intriguing realm of parametric design as a tool to convey the plurality of factors under scope in this social housing project. Through this technology the objective is to address more adaptable housing typologies to achieve social and environmental sustainability in the vulnerable context of the informal settlement of Los Arenales, situated in the arid landscape of Antofagasta in northern Chile. Within this specific community, women play a vital role, assuming leadership in the operation and management of the settlement. Hence, a pivotal shift is proposed for the design, aiming to develop a new perspective into housing typologies in a manner that not only accommodates but also celebrates the unique contributions of these women. The concept of incorporating women's needs into the design process represents a significant departure from the conventional, archaic approach to housing design that has persisted until the present day. This is especially relevant when scrutinizing extensive social housing development initiatives, where a uniform and unaccommodating design ethos prevails, neglecting the unique requirements of its (female) occupants. The 'cookie-cutter' or 'copy-paste' approach into social housing design, where one typology serves everyone forces people to adapt to the architecture and not the other way around (Kershner, 2012). I personally stand against it. Consequently, the essence of this research is to empower the inhabitants to articulate their specific needs. Furthermore, as the settlement is home to a diverse group of immigrants, the design approach acknowledges different nationalities, traditions, and a way of life, emphasizing adaptability not only in the structure of the house but also in how it connects with the city. At this point in the research, the socio political and economic context of the north of Chile, the role of the women in the settlement and in the housing environment and the influence of migration are being looked into, which can be categorized as 'soft parameters' or 'software'. The research also encompasses a comprehensive evaluation of the location, the sur-

rounding environment, the available inventory of construction materials, and the quality of workmanship. The first and even the most crucial part is to understand how they and they have built their own houses, their own city so far. That is, to learn from their methods and knowledge, creating a catalogue that can be classify as 'hard parameters' or 'hardware'. This is undertaken while acknowledging the validity of self-built construction methods and the resident's rights to remain and settle where they current houses and community are.

In broad terms, the design aims to propose a housing solution that incorporates a blend of soft and hard parameters, allowing for the implementation of diverse typologies tailored to the end-user with a focal point on the female inhabitants. This means adapting the homes to specific family needs, such as incorporating businesses on the lower floors and utilizing locally available materials by each family and accounting for unique features like a courtyard or storage space, if needed. The objective is to avoid the conventional way of doing social housing of copy-paste one design typology where all the different families, and peoples should be able to live (Currie and Sorensen, 2019).

The context within which this research is situated is complex, borne from just circumstances beyond the control of the community. The women and families of Los Arenales have exhibited exemplary resilience, organization, and dedication, successfully advocating for the recognition of Los Arenales as the place to create the first Latin American city of Chile (Andrade et al., 2022). Considering their dedication to social issues and public spaces, my research seeks to contribute from the architectural and housing perspective, proposing new typologies centred on these remarkable women. To obtain the necessary information for the project, a personal connection and bound must be established with the inhabitants, therefore the research focuses on meeting, listening and learning from these women, and all inhabitants in general. It is key to understand the culture and social context of Los Arenales to be able to translate it into parameters. My thematic research focuses on the documentation and organization of the vast amount of information related to the soft and hard parameters. The intricate web of data is central to the research and by using rules or guidelines, the apparent chaos of information is controlled (Viamonte Fernández and Peinado Checa, 2014). These do not have to be definite, parametric means flexibility, they can variate throughout the design process. Furthermore, it is particularly interesting to employ this rather innovative technology in such a resource-constrained environment.

Thus, this research aims to investigate the use of parametrization and digitization as a tool in a data driven design in the context of the informal settlement of Los Arenales. For this, organizing the data into soft and hard parameters is a crucial point to understand the complexity of the inhabitants, especially the women and the given context. Therefore, how can data utilization in design contribute to the development of social and environmentally sustainable housing models in women-led, self-built settlements of Antofagasta, northern Chile?

The expected result of this thematic and contextual framework, and its subsequent integration into an architectural design, is the development of an alternative methodology for social housing. By effectively harnessing data-driven design principles, parametricism, and a deep commitment to inclusivity and the women living there, the research endeavours to produce housing typologies that are inclusive, meaning socially sustainable, and environmentally sustainable for the community Los Arenales. Through this process, their needs and requirements will stay at the forefront.

Throughout the years, Los Arenales has undertaken a social fight to regulate their political situation. Los Arenales through different projects in the past with other authorities, on their own or through non-profit organisations, have created topographies, mapping, a few other census and a series of other necessary documents. All these technical documents together with the idea of the current government to convert the Los Arenales project into a National Emergency to solve the housing crisis, allow us to assume/predict that in the relatively near future it will be possible to build, it will be possible to urbanise, and it will be possible to create the first Latin American City of Chile. Regarding the socio-political problematics currently located there, their situation would than shift to legally build and have the tiles of the current land. This project does not participate in the socio-political struggle. Nor is it directly linked to the activism of the struggle of the inhabitants. Rather, it addresses the problem of access to decent housing from the technical perspective of architecture. Looking into the temporary line, the project is set on the future scenario of Los Arenales being projected, designed and built. In this point in time, the project proposes a new approach into social housing to design multiple adapted housing typologies to the basic needs of the inhabitants from a feminist perspective to achieve social and environmentally sustainable prototypes.

All in all, as the goal for this research is not to have a final floor plan design, the adopted methodology and design process should be able to be translated into different contexts, when adapting the parameters and the data.

II. METHODOLOGY

In order to achieve a thorough understanding of the research questions, a detailed and systematic methodology was employed, that seamlessly blends qualitative and quantitative aspects to present a nuanced picture of the topic. This methodology is rooted in the application of data collection techniques that distinctly prioritize a social and feminist perspective to than be applied into the quantitative aspects of an architectural design.

It is essential to clarify that the essence of my research is exploratory and experimental in nature, with a focus on pioneering a novel approach to social housing design, rather than providing a final, rigid blueprint. This perspective signifies a conscious choice not to impose one final solution but rather to facilitate a process. In this experimental approach, my focal point remains steadfastly on the community under study. This emphasis on the social dimension introduces fluctuant parameters, as the needs and priorities of the inhabitants may vary not only between different families but also over distinct periods of time. To navigate this dynamism, I employ subjective judgment in selecting the moments in time and the actors who will participate in the research. It is crucial to recognize that this approach provides a snapshot, not an absolute truth, of the settlement's dynamics. Furthermore, my methodology is centred on the concept of planning with informality. As aptly stated, "it requires somewhat different knowledge, skills, and methodology, as well as presents different moral dilemmas than planning in other contexts" (Papke, 2020, p. 2). This principle guides my approach as I delve into the intricacies of designing social housing that respects the uniqueness and complexities of the community I serve.

2.1. FIRST CONTACT

The research employs a multifaceted approach to gain comprehensive insights into the contextual landscape of Chile. As an outsider to the context, it is imperative to acknowledge the distance to inherent complexities influenced by political and societal constraints, often intricate and challenging to fully comprehend. To overcome this, engaging in a thorough literature review facilitates the assimilation of knowledge from an academic perspective. These experts provide a nuanced understanding rooted in the cultural and contextual fabric. To situate within this

unfamiliar distant context, the initial phase involves meticulous organization of a theoretical and contextual framework, which serve as a guiding mechanism to identify and filter crucial information.

Integral to this methodology is the collection of contacts on site, many of which are authors of the analysed literature. These connections serve as pivotal conduits, enabling the collection of firsthand perspective (primary data) and enriching the study with valuable insights into socio-political and economic dynamics. At the end, the interviews conducted online before the research-travel about their work within the context transformed into networking sessions, crucial for the site visit. The interviews follow a semi-structured format, encouraging open dialogue with non-leading questions.

On top of the contextual research and theoretical approach, as this is an architectural project on the field of social housing, many case studies as well as common Chilean typologies. These were either built in the context of housing emergencies or just as mass production of low cost housing, such as Elemental from Aravena, TECHO definitive and emergency housing, Pequeños Condominios in Peñalolén as well as the vertical ghettos in Santiago and the typical housing block all over Chile. Investigating, retracing and visiting some of these complexes was crucial to later develop some design guidelines. It was crucial that these projects were already built and inhabited to learn not only from the concept development but also the managerial strategies and if they actually worked or not after some years. The chosen international projects (PREVI and Barriadas de Integración in Perú, Aranya Low cost housing and Belapur incremental Housing in India) are based on ideas of incrementality, participatory methods and and low cost housing in vulnerable contexts.



The first set of contacts was set on zoom meetings and phone calls due to the geographica distance between Chile and Europe.

ACADEMICS
GENERAL TOPICS

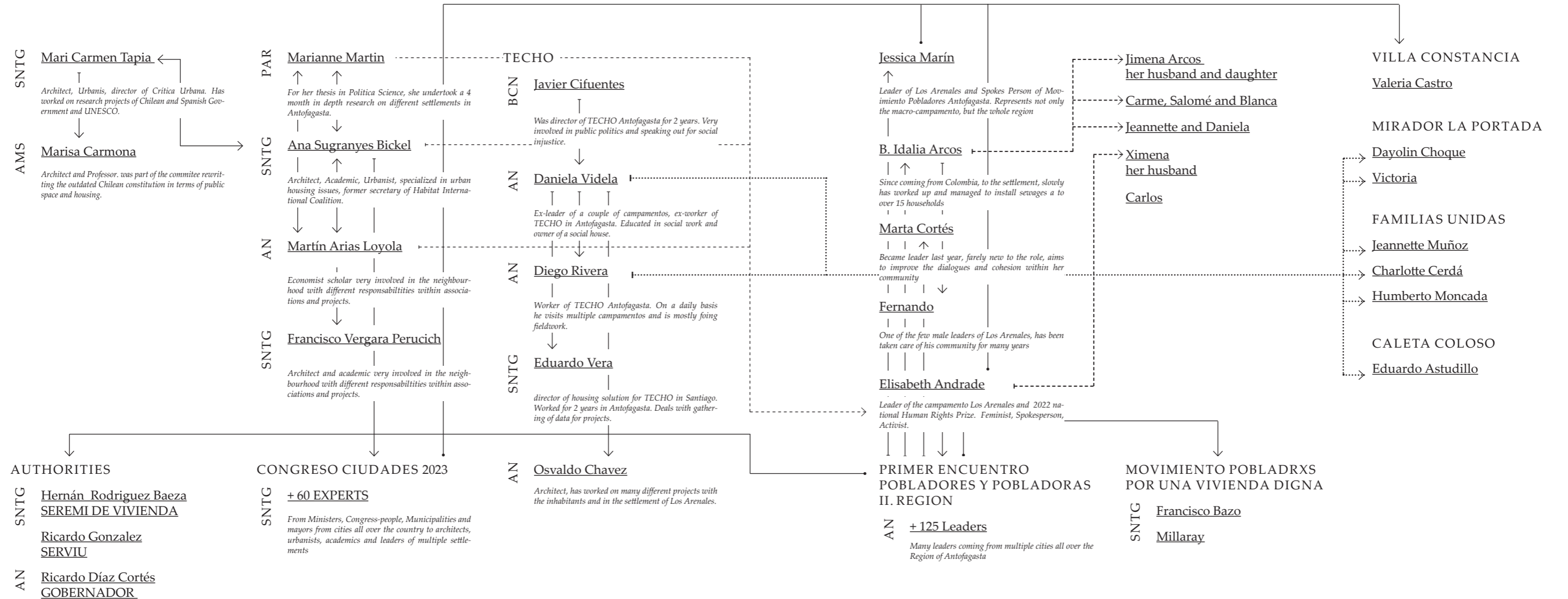
ACADEMICS
EXPERTS AND AUTHORS

EXPERTS AND
PROFESSIONALS ON SITE

LEADERS OF
LOS ARENALES

FURTHER INHABITANTS
LOS ARENALES

LEADER OF
MULTIPLE CAMPAMENTOS



2.2. PRIMARY SOURCE DATA COLLECTION

The focus of interviews during the research trip revolves around understanding of the community, starting by the management and organizational strategies of female leaders within a settlement. The aim spans from personal anecdotes to legal insights, treating these leaders as experts. However, the settlement's diversity extends beyond these women, encompassing various demographics like children, elderly, disabled individuals, migrants, emphasizing inclusivity and respect for diverse perspectives. To counter these uncertainties during the site visit, setting clear objectives becomes crucial. These objectives act as guiding principles, ensuring alignment with the mission even in the face of unforeseen challenges. Offering interviewees, the freedom to express themselves is pivotal. While a framework exists, emphasis lies on allowing free speech. Additionally, the Assembling Past Methodology used during this research involves interviews extending beyond traditional questioning to include diaries, postcards, and poems, such as the ones published in *Mujeres Los Arenales* back in 2020 (Mujeres de Los Arenales, 2020) (Machado e Moura et al., 2023). The collection of different mediums allows to capture intangible aspects of the different experiences.

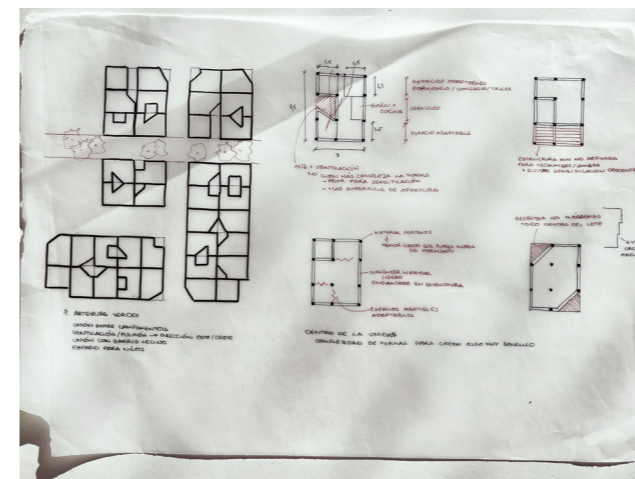
Interviews also involve inviting participants to sketch and express their needs through drawings, serving as conversation starters and aids in mutual understanding. This departure from a top-down approach aims to redistribute power to include marginalized voices in future design processes (Arnstein, 1969). One of the main goals amidst these interviews is to bridge geographical and cultural gaps, immersing in the community's daily lives. As being a white outsider from a different continent, a "gringo" is a step back, building trusting relationships becomes pivotal in overcoming initial barriers and producing knowledge through respectful interactions (Quirós, 2014, p. 63). The personal connection formed not only through the interviews, but while being there, present on a daily basis, accompanying them through daily tasks and joining their meeting allow to empathize with the community which holds a significant potential in enriching project depth. Understanding and learning from informal settlement communities are highlighted as crucial since they generate and own the information necessary for the project's soft parameters. Maps, inherently abstract, offer a single version of reality, demanding selection, and interpretation. Understanding the significance of these selections, from both locals and me, is pivotal. Walking the settlement with inhabitants unveils narratives: what happens, where, with whom, and why? This exploration forms a labyrinth of anecdotes, capturing how they perceive spaces. The collection of information about the software is enriching and large. However, hard parameters, such as building techniques, materials and elements related to the built environment, present challenges due to the scarcity of online and published data, requiring extensive visual and graphic data collection efforts to support research and subsequent design phases.



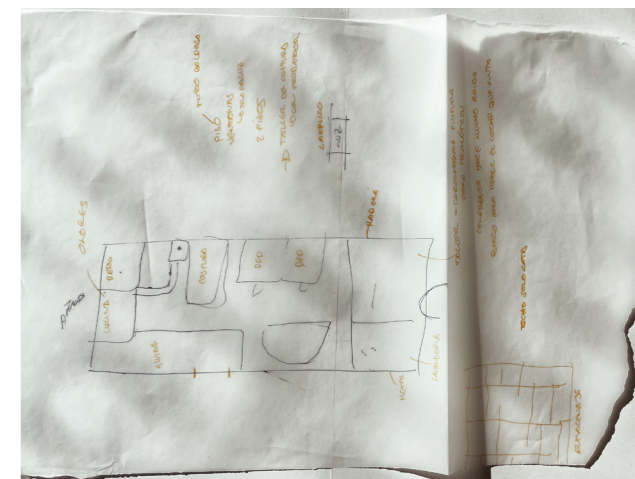
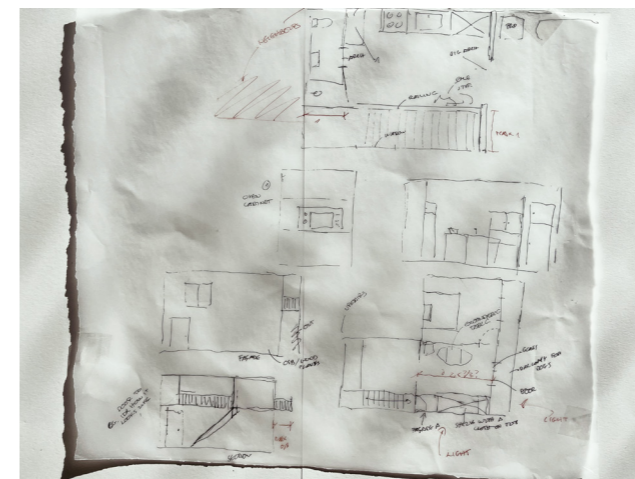
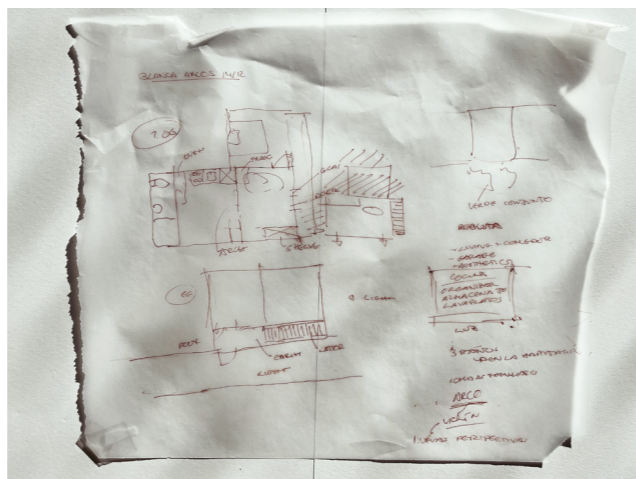
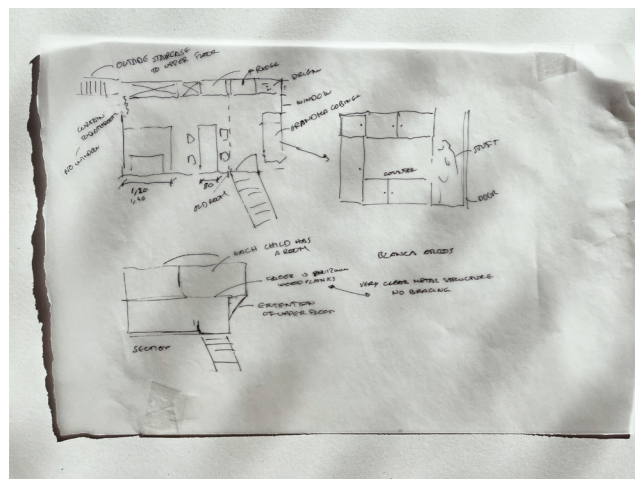
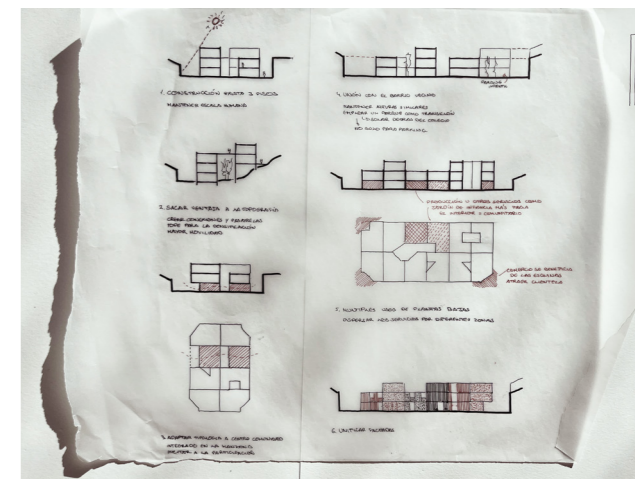
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Desde el Mirador, D.V. y D.R., mis guías del día, junto a D.C. y su hijo, habitantes del campamento (arriba). From the Mirador, D.V. and D.R., my guides for the day, together with D.C. and her son, inhabitants of the campamento (above).

Walkign around, alone or with the women I started to map the services and the neighbourhood, as there is no available data about it.



All my concepts had to be translated to spanish to be able to communicate with the community. My ideas about neighbourhood development, housing, and shapes were presented to them and discussed with the community.



Together with the women we sketched their current houses as well as their wishes and goals for a future Los Arenales.

2.3. CHANNELLING THE INFORMATION

After the site visit to Los Arenales, the extensive data gathered becomes the foundational cornerstone of the research journey, shaping subsequent analyses and later on design considerations. To effectively navigate this wealth of information, I adopt a comprehensive approach that integrates both qualitative and quantitative methodologies. This dual approach is instrumental in achieving a holistic understanding of the community's dynamics, encompassing not only their tangible housing needs ("hardware") but also the intangible aspects of their experiences and aspirations ("software"). On one hand, qualitative analysis delves into the rich narratives and daily experiences of the women and inhabitants of Los Arenales. This exploration yields invaluable insights into their lives, aspirations, and challenges. These qualitative aspects are translated into parameters that inform the design process. For example, anecdotes about feeling unsafe in dark entryways or the need for proper ventilation in kitchen spaces are transformed into design rules, which could be wider and safer street layouts or the mandatory need for at least one window per room. This process involves translating qualitative narrations into quantifiable metrics, enabling a more structured and data-driven approach to architectural design. Complementing the qualitative approach, I utilize quantitative analysis to process extensive datasets on housing conditions, infrastructure, and material resources. This includes analysing the number and types of structural elements like timber pillars or corrugated metal sheets, assessing access to essential services like water and electricity, and understanding the financial capabilities of individual families. These quantitative insights provide tangible metrics that complement the qualitative narratives, enriching our understanding of the community's needs and priorities.-

The information was not only retraced and weighted in a subjective manner, but, in transferring it to computer tools like Excel, I can create a comprehensive overview of individual families, their unique circumstances, and the nuanced narratives shared during interviews. This tool facilitates the correlation between qualitative insights and quantitative parameters, facilitating a more nuanced understanding of how individual experiences align with tangible architectural considerations. For instance, it can help in determining averages, ratios, or correlations between various parameters, contributing to a more robust understanding of the community's requirements. Its organizational capabilities and analytical functionalities lay the groundwork for a seamless transition of information into architectural programs like Rhino and Grasshopper, enabling the translation of insights into innovative and responsive design solutions for inclusive, sustainable, and adaptable housing.

The culmination of this analytical work, starting as interviews, pictures on site and sketches, is a comprehensive dataset presented in the form of sliders or pictograms put together in the Annex Los Arenales. This dataset juxtaposes women's narratives with critical architectural analyses, highlighting valuable elements from

existing structures that can inform future design phases. The method of breaking down the built element, by retracing and critically analysing it is not only done with these on site structures, but also with multiple already built housing projects in Antofagasta and Chile and other social housing projects worldwide. By critically examining and weighing these precedents, I am equipped to make informed decisions that will shape the trajectory of the research and design process.

2.4. CONCLUSION OF METHODOLOGY

This research methodology intertwines qualitative depth and quantitative rigor, forming a comprehensive perspective on Los Arenales of Antofagasta. Anchored in a conscientious ethos, it prioritizes social and feminist viewpoints, aiming not to impose a fixed solution but to cultivate multiple potential housing proposals. It embodies a collaborative and empathetic approach, enriching the connection between residents and their built environment. Structured intricately, each phase, from extensive literature review to on-site engagement and innovative data collection, aims to encapsulate the essence of Los Arenales. Interviews, mapping exercises, and visual documentation serve as conduits, capturing nuanced narratives and lived experiences. The post-field trip phase transforms amassed data into a guiding force, transcending analysis to fuel concrete architectural solutions. Vital to this methodology is the seamless integration of qualitative insights and quantitative parameters facilitated by computer tools. These tools become the bridge between individual experiences and architectural considerations.

Reflecting on the participatory nature of this research journey underscores the potential impacts, both positive and negative, on the Los Arenales community. Engaging with locals and entities offers a platform for mutual exchange, yet fieldwork prompts contemplation about potential one-sided benefits. Addressing concerns about equitable exchange becomes pivotal, emphasizing the reciprocal contribution to the community during and after the research phase. The fact of working with interviews, individual subjects, and private testimonies is intrinsically related to a subjective data collection as well. If another author were to gather these statements, there would be a different outcome. Therefore, it is important to emphasize that the project does not present the reality of the camp or all the women, but rather a snapshot of the social, political, and economic situation surrounding their right to the city and to decent self-built housing.



III. THEORETICAL FRAMEWORK

3.1. DATA AND PARAMETRIC DESIGN IN ARCHITECTURE

In the realm of parametricism, there are theories and definition, still its use and possibilities are to be explored. Described as a “control technique of [...] apparent chaos achieved through the repetition of simple rules”, the core concept centres on treating individual data points as parameters (Viamonte Fernández and Peinado Checa, 2014, p. 115). These parameters, when organized and governed by rules, coalesce into a system, creating a network of possibilities. Although the word rules might sound stiff and set, nonetheless, the whole idea of the system is that they can vary, therefore, the emphasis is to be able to adapt, change and explore better and further solutions. As a result, “parametrization is a mechanism that allows the application of the same algorithm to different types”, enabling the selection of the most effective solution from numerous proposals to address the problem (Viamonte Fernández and Peinado Checa, 2014, p. 115). The created network of proposals is not solely a tool for information filtration; it also serves as a foundation for an architectural design.

The minds of urban and architectural planners can comprehend copious details and vast amounts of data, yet “the task to develop an architectural and urban repertoire [...] which is densely layered and continuously differentiated” might be too complex for humans solely (An and Wang, 2012). As society, we just keep on becoming more complex, and therefore regarding the architecture projects that we inhabit, the role of parametrization in the Built Environment becomes pivotal. With the help of technology, these intertwined networks of information can be processed into a design with ease (Schumacher, 2008). The communication between the architect and computer, parametricism, at its core, influences contemporary architecture.

Given that now more details and information can be understood, can architecture be adapted in a more individualized manner, thereby enhancing quality for the end user? Instead of proposing project that are supposed to solve many questions and host many diverse people under the same roof, could data driven designs be the path to more individualized architecture without elevating the cost? This intricate world and proposed design approaches prompts a shift into how the built environment is seen: architecture should adapt to and cater to its users, rather than the inhabitants conforming to architecture (Schumacher, 2008, p. 3). The ar-

chitecture can be done for the people with the help of technology. The integration of societal, environmental, and economic parameters, between others, into design becomes a tangible reality (Viamonte Fernández and Peinado Checa, 2014, p. 115). Depending on the context, the means and the needs the parameters shift. Meaning, with one project proposal, the outcome would still be vastly different just by adjusting some of the data to each specific situation. For instance, only 30% of households consist of traditional family units, composed of couples and children, while the remaining 70% are single-person households or other family configurations like single-parent families or individuals living together in family-like relationships. Often, the spatial layout lacks flexibility, with clearly defined uses for rooms such as bedrooms, living rooms, and kitchens, to the extent that the room’s name defines its function. However, people’s needs change over their lifetimes, so the use of spaces should be adaptable to accommodate evolving needs (Col·lectiu Punt 6, 2019, p. 184). Thus, data driven design and parametricism empowers architects to comprehend, organize and filter copious information, such as all these many different family constellations, facilitating the design for more fitting end products. This evokes a fundamental question: At the end, who shapes the design? Is it the computer, filtering data and making decisions, or the architect, interpreting the information and crafting the final product?

3.2. THE ROLE OF THE ARCHITECT: BETWEEN THE END-USER AND THE COMPUTER TOOL

Through history, architectural expression transitioned from analogue drawing to contemporary computer drawings, progressively embracing more sophisticated tools like parametrization or in a short future or even present times, the use of AI. While architects are adept at envisioning optimal solutions, they are bound to human limitations, thus the introduction of a collaboration with computer tools. Referencing Habermas’ Theory of Communicative Action, which illuminates human interaction and communication as social actions, the role of the architect extends beyond the design (Habermas, 1984). This process entails fostering a conversation between the product and the end-user, seeking a shared understanding similar to translators working in a multilingual setting. Although computers are praised for their efficiency in data processing, their limitation in discerning subtleties and empathetic interpretation is evident. This underscores the crucial role of the architect in managing these intricate details within data usage, particularly to empathize with the inhabitant. The duality between Communicative Reality (the architect) and Instrumental Reality (the computer) not only concerns the data itself, but also its collection methods. Traditionally census, for instance, focus solely on inhabitant counts often overlooking spatial dimensions within settlements (DESA, 2019). In these it is incumbent upon the architect to navigate biases, transcend-

ing mere numerical data and viewing technology as an enabling tool rather than an absolute truth. An underlying concern questions whether rigid technological frameworks might curb creativity, leading to generalized project outcomes (Bhatt, 2010). However, I advocate that the architect's interaction with the computer remains a symbiotic relationship, just a tool in the hands of the architect. It is the architect the one that after the conversations and contact with the future inhabitants inserts the data (input). The computer proposes solutions and enables design possibilities. After this, the responsibility shifts back to the architect, to communicate the solutions to the inhabitant and restart the dialog about her needs and wishes (output). Therefore, the architect interprets the data before and after, there is always a human approach towards the design and the methodology.

3.3. FEMINIST APPROACH WHEN THERE IS NO DATA ABOUT WOMEN

As important as it is to understand to how we use the data and if it is the computer or the expert, the architect in this case, taking the final decision, it is also important to investigate what type of data is collected. What is the information worth being stored, then sorted and finally used? Taken data in the built environment is not just about counting how many people live in a city or the average age of all these inhabitants. Patriarchal societal norms make invisible the lack of data that regarding women. The gendered data gap affects women's lives daily, its silence has consequences. It could be an insignificantly small burden like not reaching the top shelf because it was set based on the male average height. In architecture schools, design is being taught with manuals like Neufert published for the first time in 1951 (Neufert, 1951). Here, average distances, scales and proportions are mostly based on an average German man of about 180 cm. Since then, societal and cultural priorities have also shifted and is still being used as a default designing tool. The idea of standardization to accelerate processes has its downsides in many fields, not just architecture. The same happens as when we learn about the body in biology class, the default one, or we learn about the female body (Travis, 1993). Nonetheless, it could be of higher importance, as with zoning laws in the cities, where it is mostly men who take part in the committees even up to date and perpetuate the injustice in their decisions (Sanchez de Mandariaga, 2013). Therefore, the strategies are based on a "bread-winning heterosexual married male, who goes off to work in the morning and comes home to the suburbs to relax at night" (Criado Perez, 2019, p. 40). The male reality in sizes and lifestyle has been used as the generic norm. This discriminatory standard is even visible in many language constructs. As Criado Perez exemplifies, there could be a room with hundred female teachers, in Spanish profesoras and the moment one male teacher would walk in, they would all become profesores, the generic masculine (Criado Perez, 2019, p. 6). Regarding language, it is important to point out, that in the following analysed specific context, the women leading the settlements in Antofagasta, are not just leaders dirigentes, but they are dirigentas. The feminine word is used in

this case as the default one, as they are the solely ones managing the settlements. Through this research and the subsequent design, the aim is to investigate the impact of architectural decisions on the sexual division of labour, exposing its negative influences on women's lives. For instance, a considerable number of women residing in informal settlements subsist on a day-to-day basis. Consequently, an unexpected event, such as inclement weather that prevents them from work, may leave them without food for the day (Marín, 2023). These women engage in various forms of employment, often conducted from their residences, such as selling drinks, preparing meals, or cutting people's hair. In informal settlements lacking regulatory zones, these domestic spaces, seamlessly transform into commercial establishments. Nonetheless, within government-developed public housing projects, the designated use is merely for residential purpose. This stringent policy dictates that "running a business from your home is strictly forbidden", risking eviction consequently (Criado Perez, 2019, p. 44). As a result, these entrepreneurial women face the risk of homelessness or unemployment, as their means of livelihood remain invisible due to insufficient research and understanding.

It is well-known that spaces subtly convey the values and responsibilities attributed by patriarchal society to women and men. Non-flexible, hierarchical spaces impose pressure on women and users in general, dictating what activities should take place within those hidden spaces. These meticulously organized rooms are often isolated from the rest of household life, lacking windows, being tiny, and equipped minimally for necessary tasks. For example, a woman ironing or doing laundry might spend several hours a day locked away in a room resembling more of a closet, devoid of contact with anyone and lacking even a meagre window. Such working conditions are not deemed acceptable for office design by modern standards, yet they persist in domestic settings and household chores. Nonetheless, the ongoing power imbalance and resulting consequences that women must contend on daily basis are evident in how space is used, which is often designed by men. This issue has persisted since as far back as the 8th century BCE, as seen in Homer's renowned poem "Odyssey," where the desire for male authority within the private and domestic sphere, is expressed. The protagonist of the poem dictates over his mother, instructing her to set back into domestic tasks and yield leadership to men. Societal constructs push women towards most domestic work, hiding in the back of the house, while taking care of the family (Maria Montaner and Muxí, 2020, p. 205). Still, there are some positive examples to learn from, where females were taken into account when designing housing communities. Already back in the 1970s' some material feminists in the USA started to design housewife's cooperatives. These would not include private kitchen in each household, but rather invest in cribs for the children, communal kitchen or food services. They were largely criticized for mostly only catering for white middle class women. Nonetheless, they were a first example of how different spatial configurations could alleviate the domestic burden of the women. They did not have to look after the children, as the communal effort was doing it, or clean the kitchen, as it was an out-sourced service (Hayden, 1981). Something similar to the material

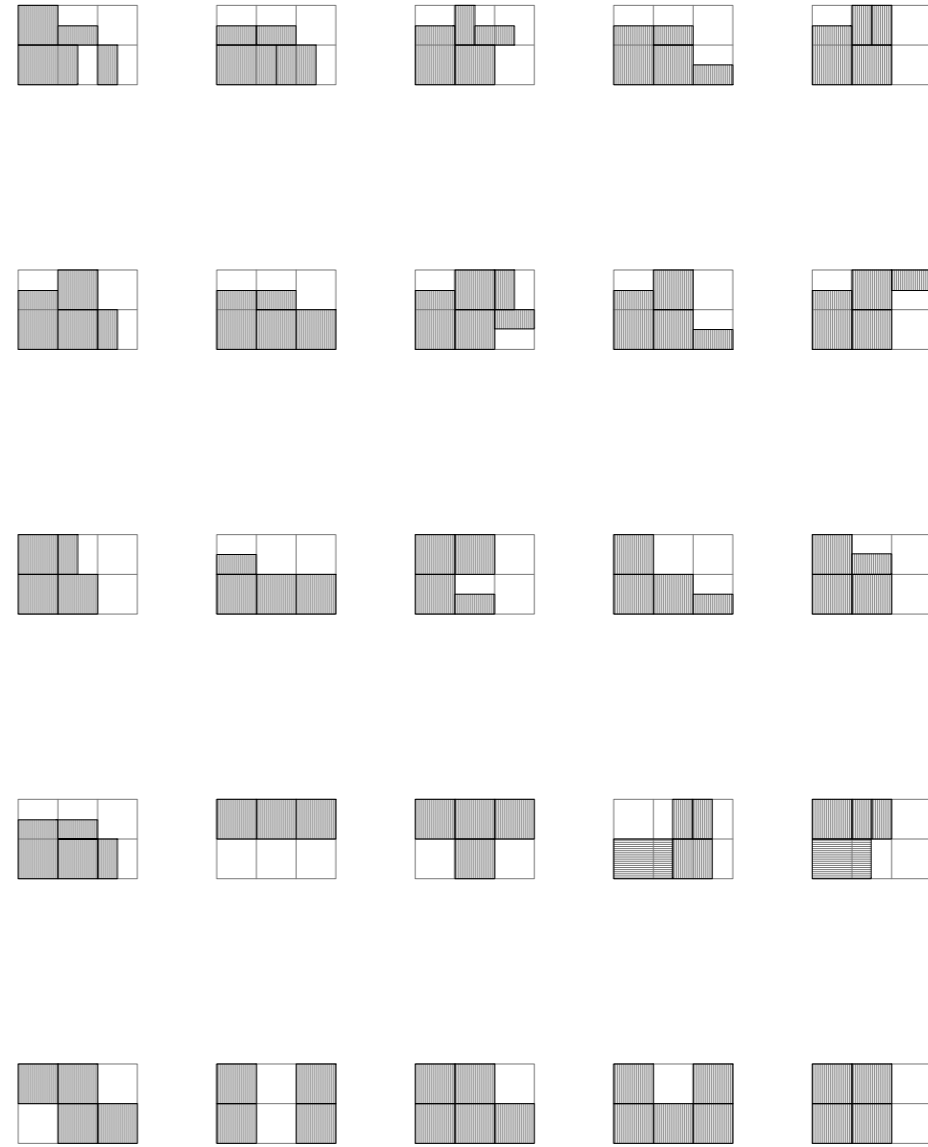
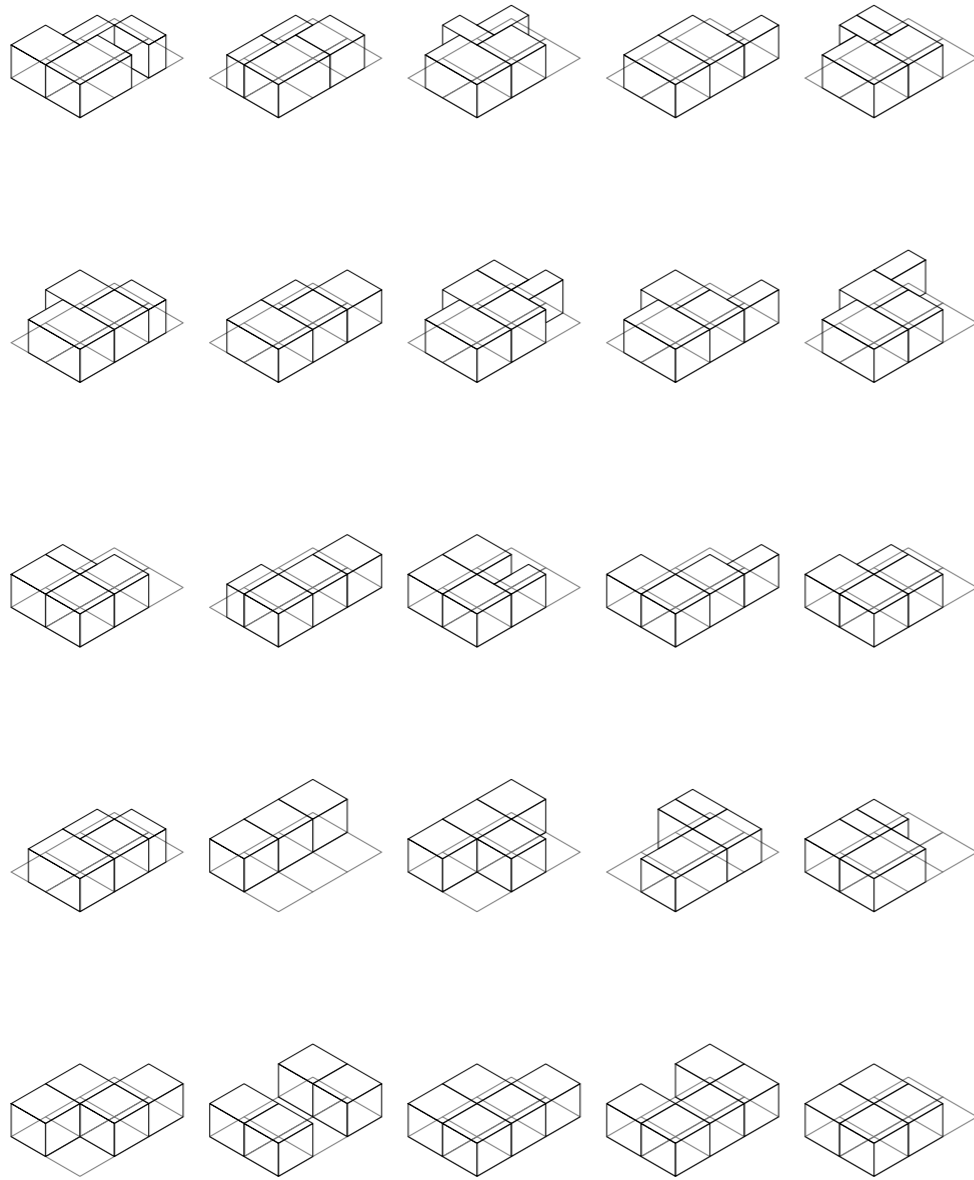
feminists happened in Viena with the Frauenwerkstadt, where it was a team of female architects who took the lead of the project. These female architects did not only shift the priorities but also talked to the future female inhabitants to have a better understanding on their housing needs. In this project, the floor plans were designed considering the cycles of daily tasks such as laundry or the idea that multiple people could use a bathroom at the same time. These new centralities ensured that the women were not secluded into the rear side of the house. A similar approach was organized for the sequences of spaces, where storage units and bathrooms are accessed from communal spaces and there is no hierarchy between the rooms. The kitchen should be well-lit, ventilated, and centrally located within the house to enhance visibility and accessibility. By integrating these considerations into design planning, living spaces can be optimized to meet the dynamic needs of modern households, fostering efficiency, inclusivity, and adaptability in everyday living.

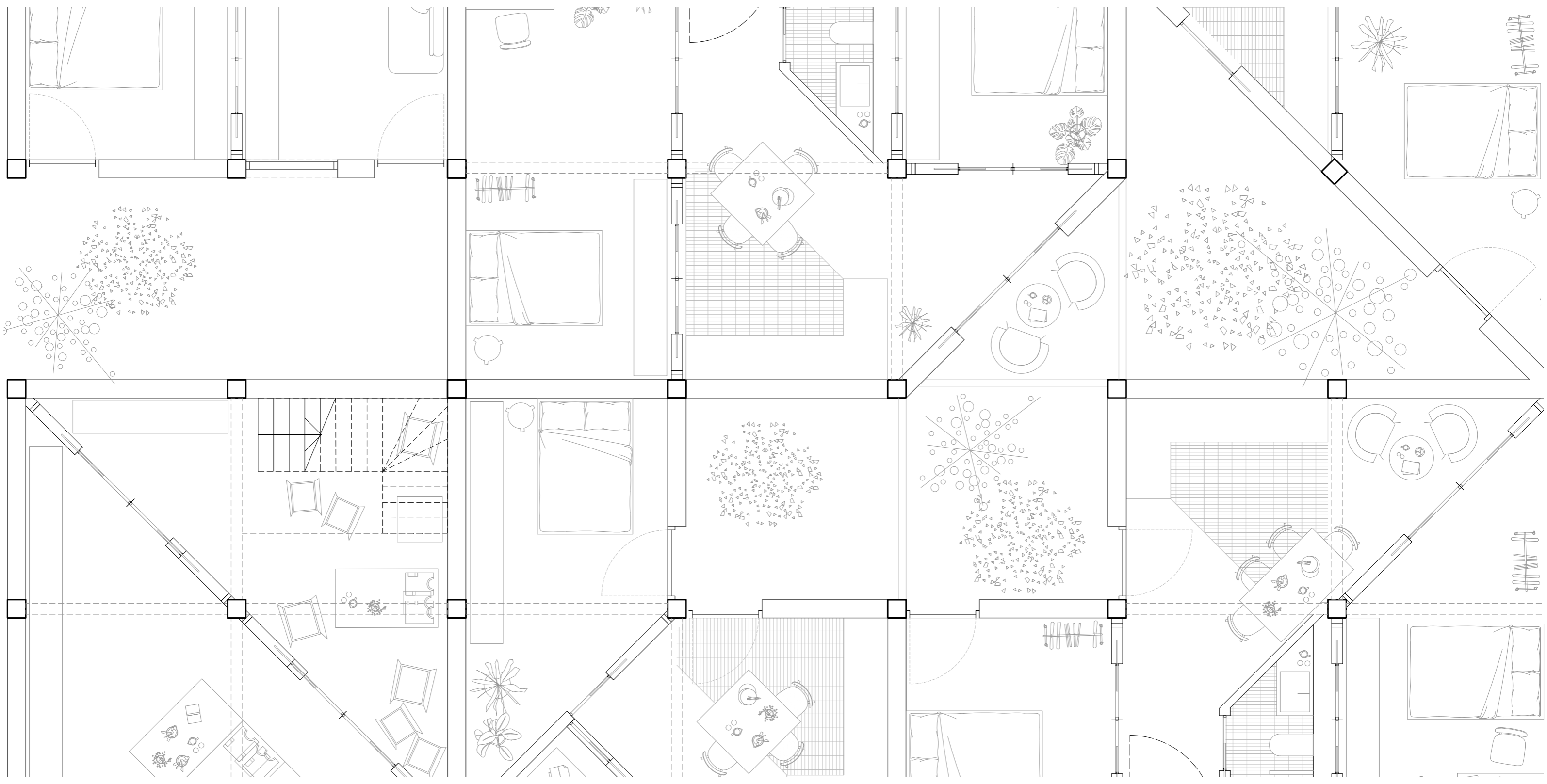
It is important to highlight that this research was done by a female architect as well as focusing on the women within the community. By speaking as a female architect with and interviewing women as primary sources of information, the design focuses on their needs and narratives, from a gendered perspective. They are the ones leading the way, as they are the ones who will spend the most time in these spaces. At the end, it will be them, each one on these women, who designs Her own Home .



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Mujeres dirigentes de toda la región han venido hoy para unirse en una causa común y unir fuerzas. Aquí, las mujeres de Tocopilla, una ciudad normalmente olvidada, nunca preferencia, ni en el punto de mira. Ellas se reúnen antes de tomar el la palabra y representar frente a las autoridades a todos los campamentos de su ciudad. Women leaders from all over the region have come today to unite in a common cause and join forces. Here, the women of Tocopilla, a normally forgotten city, are never in the spotlight. They meet before taking the microphone to represent all the campamentos of their city in front of the authorities.







IV. CONTEXTUAL FRAMEWORKS

4.1. THREADS OF INJUSTICE

4.1.1. CHALLENGING NEOLIBERAL CONSTRUCTS: DIGNITY AND COMMUNITY WITHIN THE CONTEXT OF VULNERABILITY

The current society is based on a capitalistic ideology, which has penetrated to deep, it rules the way we relate to each other (Tapia Gómez, 2023, p. 3). Meaning, “capitalism traps us in its wheel of consumption-debt-pollution-self-abuse”, neglecting out independence and autonomy (Tapia Gómez, 2023, p. 16). Tediously, everybody is working trying to make the most return (economic retribution) possible and therefore be able to pay to satisfy our needs inside the system. Working to get money to be able to buy. With this the seller will have money and will be able to buy as well. It is a continuous system. Nonetheless, the dependency on one another is not fair for all. Mere workers live in a state of injustice and inferiority as the people who own the capital appropriate the good of their labour and craftsmanship. Meaning, their work and knowledge is owned by their employers who have the power over them. Therefore, capitalism is maintained through the inequalities that it creates (Kapstein López, 2010, p. 18). The question arises, what if the system does not want to work with one? Where does one fit in the equation? Breaking the system can mean breaking the relations of power and hierarchies. When the established unfair society does not allow otherwise, some build up communities to strengthen each other (Rocco and Ballegooijen, 2019). These grassroots approaches arise in spaces where the economic system cannot directly function, they signify shifts not just in size but also in essential conceptual, institutional, and practical facets of what is typically define as ‘economic transactions (Mrtenbck et al., 2015, p. 105). Through past and present acts of self-governance, reclaimed environments, and redefined interpersonal connections, these experiences disrupt conventional paradigms, prompting a reconsideration of how to perpetuate life across its various dimensions, from the smallest cycles to the grandest scales (Tapia Gómez, 2023, p. 3). They have invented solutions to survive in a system that does not offer them solutions to live. Nonetheless it is important, not to romanticise these self-managed communities and grassroot associations as their creation and founding is tied to resourceless and vulnerable contexts (Arias-Loyola and Vergara Perucich, 2020, p. 278).

Vulnerability is somehow linked to poverty as well as informality (Roy, 2005, p. 148). Looking into each word individually, the issue emerges: What defines poverty? It might be economic, tied to transactions and power relations within capitalism, but it can also have a spatial dimension. Poverty is also a “lack of accessibility of the neighbourhoods where they live to the impossibility of getting a job that allows them to generate the mechanism to get out of this situation” (Kapstein López, 2010, p. 15). The use of the pronouns ‘they’ and ‘them’ in this quote, creates a division, signalling a segregation between the poor and non-poor. Could it be more correct to term it vulnerable as it expands over the financial injustice? The Cambridge Dictionary defines vulnerability as lacking strength (Cambridge Dictionary, 2023). Within established societal relations, these individuals often find themselves, without asking for it, on the weaker side, leading to an unfair status where their rights become susceptible as they lack strength, decision power and representation. They are labelled as non-citizens, residing beyond society’s protective walls, devoid of rights. In the absence of anyone advocating for their well-being in this unbalanced society, “they may be given any kind of treatment” (de Cauter, 2004, p. 48). These invisible and vulnerable groups reside parallelly in the cities, metaphorically as well as, where they have formed their own communities. By not being heard and the thread of being pushed even further away by those who have the power and the rights, dignity has served as an engine for ethical struggles motivating people suffering from any form of vulnerability to change their situation. Through speeches, communal solidarity, and grassroots movements, they yearn for a dignified life encompassing “ideas of security, justice, social recognition, comfort, well-being” (Pérez, 2018). In this context, the concept of dignity assists in shaping political stories where they see themselves as individuals worthy of fair treatment and envision the life they strive for Dignity, Vulnerability and Pride intertwine as a cohesive narrative in these communities and homes, and therefore, architecture and the built environment.

“I’d rather live here, in the dust and under the heavy sun, than in the city where someone is taking advantages of my condition as migrant and poverty, at least here I choose how to live” (Man, 30–40 years old) - (Vergara-Perucich, 2020)

4.1.2. NAVIGATING URBAN MARGINS: THE DYNAMIC OF INFORMAL SETTLEMENTS

Architecture shapes space, dictating where one moves or stays, meaning, it organizes how people can behave in a spatial way. Sometimes controlling who is allowed to enter these architectures and who is not (An and Wang, 2012). Some have access, and some others due to the unfair relations in our society, simply do not. In the present consumerism society, urban planning produces a “steep class division in the city, spatial concentration of capital, informal settlements, and a large infrastructural transformation”, that are exacerbated by the neoliberal constructs (Kaminer, Robles-Durán and Sohn, 2011, p. 150).

Still, everyone needs a safe space to live in, and “the common existence of informal settlements around the world can be understood as a natural result of people’s incapacity to create shelter and home in a formal way” (Papke, 2020, p. 9). Therefore, this duality between the vulnerable and powerful continues, creating the “new urban poverty”, residing parallel in our cities (Wilson, 1987). Where the informal side is pushed by the formal side, moving these communities far away towards the outskirts (Kaminer, Robles-Durán and Sohn, 2011, p. 149). Sometimes, these allocations into new social housing units by the formal institutions, as part of their integration into citizenship, even if it is done correctly, it is seen as a discrimination, due to its top-down approach of forcing someone to move out (Nuijten, 2013). Thanks to the inherent binary nature of capitalism, instead, there will persistently exist a core and a periphery, an internal and an external sphere (de Cauter, 2004, p. 42). There will be some that have the right to stay in the city and be part of society and there will be some that will have to leave it, due to economic and political decisions out of their reach. The periphery is cheaper, and the recently emptied plot of land in the city has potential to be mass-built for speculation. Formal entities such as institutions or private companies give “more weight to land regarding profit, rather than regarding its social functions or its centrality for residential housing” (Farha, 2018). However, there are also cases where some territories in these peripheries are occupied to deceive people and sell to them, making them believe they are property owners. It’s a social struggle, there’s abuse, and it’s very complex to understand how that works, as Mari Carmen Tapia commented in a conversation with the author.

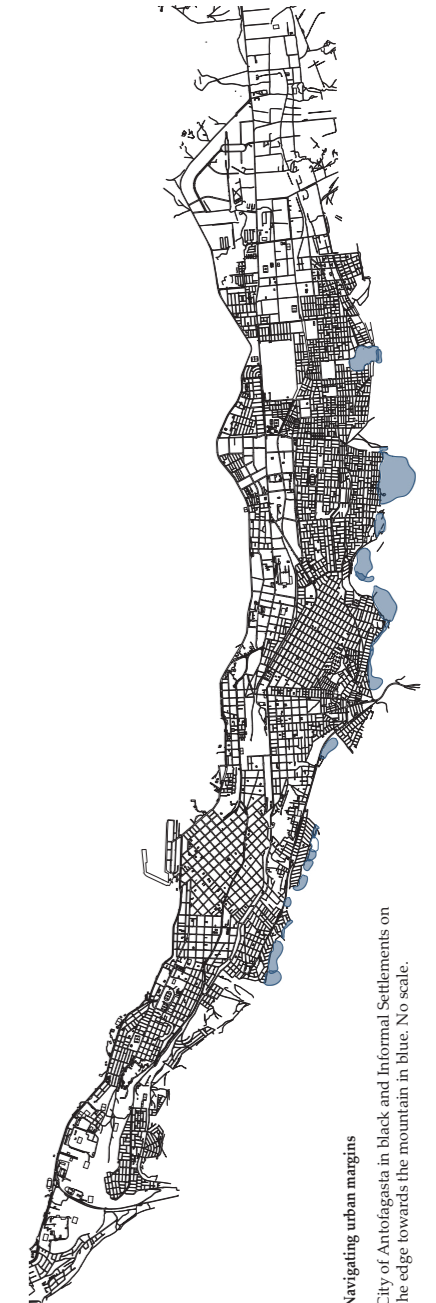
Although on the outskirts, “informal (non-tenure) settlements are often contiguous to settlements of formal origin (with tenure), which generates socio-spatial systems of high infrastructural and urban precariousness” (Region2.Cl, 2020). In these locations an invisible border between the two sides is synonym of tension and discrimination. The spatial and societal segregation “leads to the poorest not having easy access to either labour market sources or education” (Kapstein López, 2010, p. 27). As these can be typically found within the formal city, alongside other essential services. This absence of opportunities perpetuates the cycle of poverty. Interesting here, to point out how people who are constantly pushed to the limits of the city and excluded from it, create the previously mentioned grassroots com-

munities and ties, to collectively demand any kind of recognition. They have managed to establish their own set of social constructs and organization within their borders, a new system. From this arises “the city is born from its margins” and “the city is invented out of nothing” from the French anthropologist Michel Agier (Agier, 2015). Informality, mostly found in the Global South, at times perceived as divergent and disorganized, operates in ways inconceivable within Western contexts, displaying remarkable organization and resilience (Waibel and McFarlane, 2016, p. 3). The informal economy represents a spontaneous and innovative reaction of the populace due to the government’s inability to meet the basic needs of the impoverished masses (Roy, 2005, p. 148). From this, the questions arise: How might the involvement of marginalized inhabitants, impact the decisions made by public authorities regarding urban planning? What roles could architects play in empowering these communities to have a say in shaping their cities and homes?

4.1.2. NAVIGATING URBAN MARGINS: THE DYNAMIC OF INFORMAL SETTLEMENTS

“We invite all architects to participate in the project and we hope that the best design wins, bearing in mind that the technical basis of the whole process will be carried out by the neighbours who organised the project”.
Elizabeth Andrade

Elizabeth Andrade, the leader of the self-built settlement Los Arenales in Antofagasta, the settlement under scope in this project, addressed the involvement of architects during the Chilean Architecture and Urban Planning Biennale in early 2023 (Vallejos, 2023). Despite residing in informal spaces, they aim to engage formal institutions in addressing housing vulnerability and dignity. From the residents’ standpoint, openness to dialogue is crucial, even if it risks challenging aspects of their current lifestyle. On the architects’ side, there is an opportunity for a new perspective, departing from Western norms to question the foundational principles of planning and design, thereby reevaluating project priorities (Nadin and Stead, 2008). This shift in perspective has gained attraction by acknowledging alternative approaches to city-building beyond established and outdated methodologies (Bhan, 2019). This collective endeavour must revolve around common goods, addressing the fundamental question: Who is the city for? Is it for those who plan it (linked to speculation and the formal side) or for those who inhabit it (the residents, citizens, and non-citizens)? Users must hold a significant voice in shaping our urban spaces, irrespective of whether their perspectives originate



from unconventional, informal contexts. For me, self-building represents more than a construction method; it is about creating homes and cities, it is about the right for a dignified home, it is about surviving when the system does not protect one. Consequently, fostering collaboration between these users and architects is paramount. It is our collective responsibility to steer away from replicating current social housing paradigms, where non-citizens are often dismissed as statistics, rather than esteemed as human inhabitants. Each inhabitant brings invaluable insights on how to transform a mere house into a cherished home, bringing relevant concepts and information into the designing discussion (Gómez León and Merino Leyton, 2022, p. 25). This shift is not just about housing; it is about dignity, respect, and the very essence of what shapes a community. Each one of them individually deserves to be given the until now neglected attention and work together for its own individual solution in the realm of social housing.

Throughout the course of this research and project, the residents are regarded as the foremost authorities on the site. No one understands the political and social constraints of the local context (software) or the physical construction and architecture on-site (hardware) better than they do. However, as an architect specialized in this field, it is imperative not to idealize the residents. While they may know their desires for the future and how they have constructed their homes thus far, they do not possess absolute truth (Arias-Loyola and Vergara Perucich, 2020, p. 278). Their information must be critically assessed and considered. As the architect and researcher on this project, I bear the responsibility of filtering and scrutinizing their data. Nevertheless, this process is collaborative; neither party holds greater power. It is vital that dialogue between the architects and the residents remains open and ongoing. Ultimately, they are the individuals who will inhabit and care for these spaces in the future. If one feels disconnected, alienated, or foreign, the project is unlikely to succeed and may ultimately fail out of lack of contact and relevance. Social housing developments that impose a design process alien to residents, resulting in mere displacement to new homes, risk creating segregated ghettos. Preserving and fostering the sense of belonging and community already present in Los Arenales and similar vulnerable communities is crucial if proposing a re-urbanization process.

In the forthcoming design phase and subsequent chapters, proposals and guidelines from the architect's perspective will be presented. This design is not a fixed, definitive solution; rather, it resembles a toolkit or set of guidelines.

4.2. SOFTWARE: SOCIAL, POLITICAL, ECONOMIC AND CULTURAL CONSTRAINTS AND OPPORTUNITIES

4.2.1. SOFTWARE GENERAL: BROAD CONTEXT UNDER RESEARCH

Chile became a member of the Organization for Economic Cooperation and Development [OECD] in 2010, a recognition of its diligent efforts and advancements in economic management spanning several decades (Farha, 2018, p. 3). However, despite this esteemed OECD status, Chile's Gini coefficient, a measure of economic inequality within its populace, places it among the top five countries globally, highlighting a significant wealth gap between the affluent and the disadvantaged (IMF, 2016) (López Vega, Figueroa Buenavida and Gutierrez C., 2013). These statistics shed light on the economic struggles, yet the issues of inequality and injustice are more intricate. In a nation with a population of only 19 million, over 71.961 households reside in informal settlements, a number that continues to grow (Ministerio de Vivienda y Urbanismo, 2022). The conceptualization of an informal settlement or *campamento* in Chile transcends the mere concept of vulnerable housing. As stipulated by the Ministry of Housing and Urban Development in 2017, that a *campamento* is, a group of families living in poverty and social vulnerability, who informally occupy land as a result of an individual or collective strategy to satisfy the need to live, preferably in urban sectors, with 8 households or more, in concentrated or contiguous precarious housing and lacking at least one of the three basic services corresponding to electricity, water and gas (Ministerio de Vivienda y Urbanismo, 2022).

Between 2021 and 2023 alone, approximately 75,72% more families relocated to a *campamento* [Chilean term for informal settlement]. However, it is estimated that the housing crisis impacts over 600.000 families, significantly outnumbering those residing in the *campamentos* (CPI, 2022). On average, people in Chile reside in *campamentos* for about eight years. Over this extended stay, individuals often end up forsaking the chance to enhance their lives, driven solely by immediate needs, and pressing urgencies (Vergara-Perucich, 2020, p. 18). Looking at it from a global scope, the United Nations approximates that by 2050, 75% of the world's population will inhabit urban areas, with 25% already living in informal settlements today (United Nations Department of Economic and Social Affairs, 2019) (United Nations Human Settlements Programme, 2013). This exponential urbanization poses some crucial questions: How can cities manage the growing number of inhabitants, especially the informal urban expansion, while ensuring dignified living conditions for all residents? Will these non-citizens inevitably be pushed into *campamentos* for the sake of others?

As the Special Rapporteur on adequate housing for the United Nations General Assembly believes, in Chile, *campamentos* directly stem from the government's subsidiary role (Farha, 2018, p. 7). With one of Latin America's most privatized economies, citizens have had to struggle to "access to social rights in a struggle

in a neoliberal society where nobody grants you anything” (Martin, 2019, p. 68). Starting from 1978, changes in housing policies facilitated individuals becoming homeowners (Farha, 2018, p. 7). The government provided subsidies for buying or renting, but due to its subsidiary position, these services were outsourced to private companies. These entities engage with the inhabitant to construct their homes. This change elevated the role of the private real estate sector, entrusted not only with housing production but also with the allocation of public funds and the provision of credit and mortgages. It encouraged their profit-oriented approach often overrides communal needs, as their primary focus is financial gain. Leading to exacerbate the situation of the vulnerable periphery, as the land on the outskirts tends to be cheaper, “sending them to the outskirts of the cities [...] dislocating them from their communities and their identities as city-dwellers” (Farha, 2018, p. 8). These new developments were named “transitory neighbourhoods,” which sometimes lacked even more services than the campamentos and were in worse conditions. Furthermore, there was mostly an investment in quantity not quality of the housing, favouring financial aspects (Sugranyes and Rodríguez, 2000). Sometimes, during the relocation of the population into these new transitory neighbourhoods, the army was used. The military intervention embodies the idea of an emergency procedure, justified by the threat to the resident’s lives, which can suspend normal law. Thereby, thrusting the campamento into a state of exception and urgency. It is a sudden recognition of an emergency, notably absent when addressing the need for proper housing construction (Martin, 2019, p. 50).

On current times, the Government of Gabriel Boric, elected in 2022, proposed an extremely ambitious Plan de Emergencia Habitacional, [Emergency Housing Plan, from now PEH], under which only in the Region of Antofagasta 17.000 houses should be built by 2025. Almost 2 years after the plan was implemented, only 922 have been constructed (‘Plan Emergencia Habitacional - Informe 2023’, 2023). Nonetheless this plan is just for the emergency, not structural. The most severe problem is the lack of social land, and this project does not solve it (de la Fuente, 2023). Still, it has potential aspects, like investing in campamentos by building services instead of displacing the community. This project is called Plan Construyendo Barrios [Building Neighbourhoods Plan] and is supposed to be implemented in Los Arenales, the neighbourhood under scope in this project (Ministerio de Vivienda y Urbanismo, 2022, p. 55). It will be implemented in this settlement as they have been fighting, progressing, and demonstrating as a self-managed community, that they have the rights, possibilities and power to develop the settlement into the first Latin American city in Chile (Andrade et al., 2022). Moreover, political complications such as the Caso Convenio, shortly, a corruption case involving NGO activities on-site, have resulted in the cessation of numerous projects (Martin, 2023a). This interruption in operations serves the interests of both regional and national governments by maintaining control and averting a potential scandal related to the misappropriation of significant funds. However, the repercussions are borne by the local inhabitants. Basic initiatives, like conducting a census for municipal registration, have been indefinitely post-

poned, leaving the residents adrift and without recourse. Furthermore, the PEH, faces scrutiny and the looming possibility of termination. Consequently, the right to settle on-site for Los Arenales, is also subject to investigation and potential upheaval (Sugranyes Bickel, 2023).

In a setting where housing policies favouring neoliberalism have led to the separation of impoverished families in the outskirts of the city, the movements among pobladores [Chilean term for those who have to fight for their right to the city and a dignified home as it is not directly given to them] advocating for housing are articulated using a political discourse that places significant emphasis on the concept of ‘dignity’ (Pérez, 2018, p. 508). The notion of fight for respect and dignity, comes back throughout Chile’s history, not only under the idea of housing rights. It is worth mentioning the cultural strength this country has displayed in combating injustice, exemplified by the Estallido Social [Social Outburst] of 2019. Originating from public transport fare hikes, this movement empowered citizens to hold the State accountable across various domains. It evolved into one of the country’s most significant social revolutions, symbolizing a moment where “Chile woke up” to “conquer solutions and not wait for them” (Angelcos, 2020).

However, Chile is not only made out Chilean people with struggles. The housing problematic extends to disproportionately impact migrants, primarily from Bolivia, Peru, and Colombia, arriving via the northern regions such as Antofagasta (Tapia Gómez, 2020, p. 17). They make up to 34,7% of the households in the campamentos (Gómez, 2023). Initially, many were renters in urban areas, financially stable and part of the formal economy (Cifuentes, 2023). However, several factors, including racism, left to their inability to sustain rent payments, forcing their relocation to campamentos. It must be mentioned that most of the people entering the campamentos, already know someone there, meaning, they have already set ties with the community. Sometimes, they could have paid rent, but it was the landlord, who refused to accept the families based on their nationality. Antofagasta, characterized by strong inequalities, particularly affecting migrants can be summed up as: “if you’re a migrant, you can’t get sick, otherwise you can’t pay rent, you can’t eat” (Martin, 2019, p. 62). It is also interesting to distinguish between campamentos primarily occupied by Chileans and those housing many Latin American immigrants. On the one hand, for Chileans in general, a campamento is synonym of a ‘waiting territory,’ a place from which they are afterwards displaced into social housing, it is a transitory location (Vidal and Musset, 2015). On the other hand, for Latins, often lacking social support systems in their home countries, view these settlements not merely as temporary spaces before a social housing solution is offered by the government. In contrast, for them the campamento represents their long-term residence with their community. This perspective is evident in their construction techniques and urban layout. International campamentos deliberately maintain more open spaces between dwellings, plan streets wide enough for cars and ensure equitable division of plots. This is a manifestation of their higher level of organization (Brian Valenzuela, Prieto Suárez

and Sabatini Downey, 2010). A further example of the strength of the migrants is their responsibility towards their families, while they live in a precarious situation and even work multiple jobs, they came here to be able to send money back home to their families and children studying in universities (Martin, 2019, p. 62). This is for no reason a discriminatory argument towards Chilean; however, it tries to highlight the accomplishments of the migrant communities.

In the northern regions, especially in Antofagasta, inequalities are incremented by the profitable market of the miner, directly linked to an extreme capitalistic market, which makes some of its inhabitants live very well accommodated, far above the poverty line. The profit driven relationship exacerbates the abuse of power by ones getting richer on the cost of the others, these others tend to have to move to the settlements as they cannot afford to live where else, This sector has a direct link to the poverty of the region, or better said, disparities (Ferrer, 2018). Antofagasta “has the largest copper and lithium deposits in the worlds and is the largest producer of both minerals” (Arias-Loyola and Vergara Perucich, 2020, p. 283). The consequences of the extraction include contamination, destruction of the ecosystem, unemployment, precarious living standards as well as a disproportionate increase in the housing and renting prices due to the exorbitant salaries of the people working in this sector. Housing related complications are especially dramatic with respect to the imbalance in rental prices, currently, well above the average income level of most inhabitants (Arias Loyola, Vergara-Perucich and Vega-Rojas, 2023). Between 2000 and 2017 Antofagasta saw an increase of 538% of its rental prices, while household incomes only witness a modest increase of 129%, exacerbating the housing affordability crisis in the region (Vergara-Perucich, 2020, p. 13) (CASEN, 2018). The steep rise in lease prices, led to 74.8% of families seeking refuge in camps (Gómez, 2023).

4.2.2. SOFTWARE SPECIFIC: SELF-BUILT AND SELF-MANAGED SETTLEMENT OF LOS ARENALES

Cities and Communities in developing countries or corners of the world are described as “big but not powerful,” although they have a strength and fight, we, in the western world, cannot even start to grasp (Robinson, 2002). Furthermore, Los Arenales specifically aligns with Lefebvre’s notions, advocating for “grassroot organizations to form a political agenda for social transformation through utopian thinking” (Vergara-Perucich, 2020, p. 3). This implies that, currently, a sense of belonging to the city is absent, yet there exists “the possibility of creating a different city, thanks to the radical participation in all public domains” (Lefebvre, 1968). Thus, the informal settlement, the residence, and the neighbourhood transcend mere physical spaces. They encompass social dimensions, daily life, collective histories, and intangible elements that coalesce to form a cohesive whole (Costes, 2010).

Since its creation in 2013, Los Arenales has been taken the city and specially its government by storm. With a fearless dedication, its impressive organization and managerial strategies have convinced the authorities that they are worth been listen to. Divided, or united depends on the perspective, in 16 Housing Committees, Los Arenales encompasses over 2.200 families. Most of these Committees are led by women, especially migrant women. Although men also assume leadership roles, it is predominantly women who shoulder this responsibility, earning them the epithet “creators of the city” (Martin, 2023b). This recognition and name serve as a tribute to their historically inseparable roles. Numerous studies concur on the pivotal role women assume in urban movements and broader struggles pertaining to survival (Pérez Orozco, 2019). Women occupy a pivotal position not just within the productive economy but also in the domain of reproductive occupations, such as caregiving. In both scenarios, they actively contribute to communal unity by leading communal gatherings and organizational events. This proactive involvement often stems from their direct engagement in traditionally understood as feminine duties, encompassing the upkeep and tidying of communal spaces, managing food and its preparation, and engaging in public social exchanges. These responsibilities are influenced by archaic societal, of unwritten norms. Where “men often justify themselves by saying that they don’t have enough time” (Gómez León and Merino Leyton, 2022, p. 25). While it is taken for granted that women do have time after cleaning, cooking, working, and taking care of the children and elderly. Collectively, these women support each other, not only enhancing their personal living standards but also uplifting their families and the broader community. These women, at the forefront of advocating for change, have “developed a master plan by applying transductive reasoning to advance their political agenda” (Vergara-Perucich, 2020, p. 7). Collaboratively, for example, they have implemented safety measures to mitigate risks, establishing Emergency Brigades after campamento fires to avert potential disasters. Remarkably, 90% of those who joined were women (Region2.Cl, 2020). Together, they unite in advocacy for their people.

**“Unstitching to stitch,
with a knit of our own”
“We imagine Another Chile... without borders,
without racism, without militias, without displacement.”**

(Mujeres de Los Arenales, 2020)



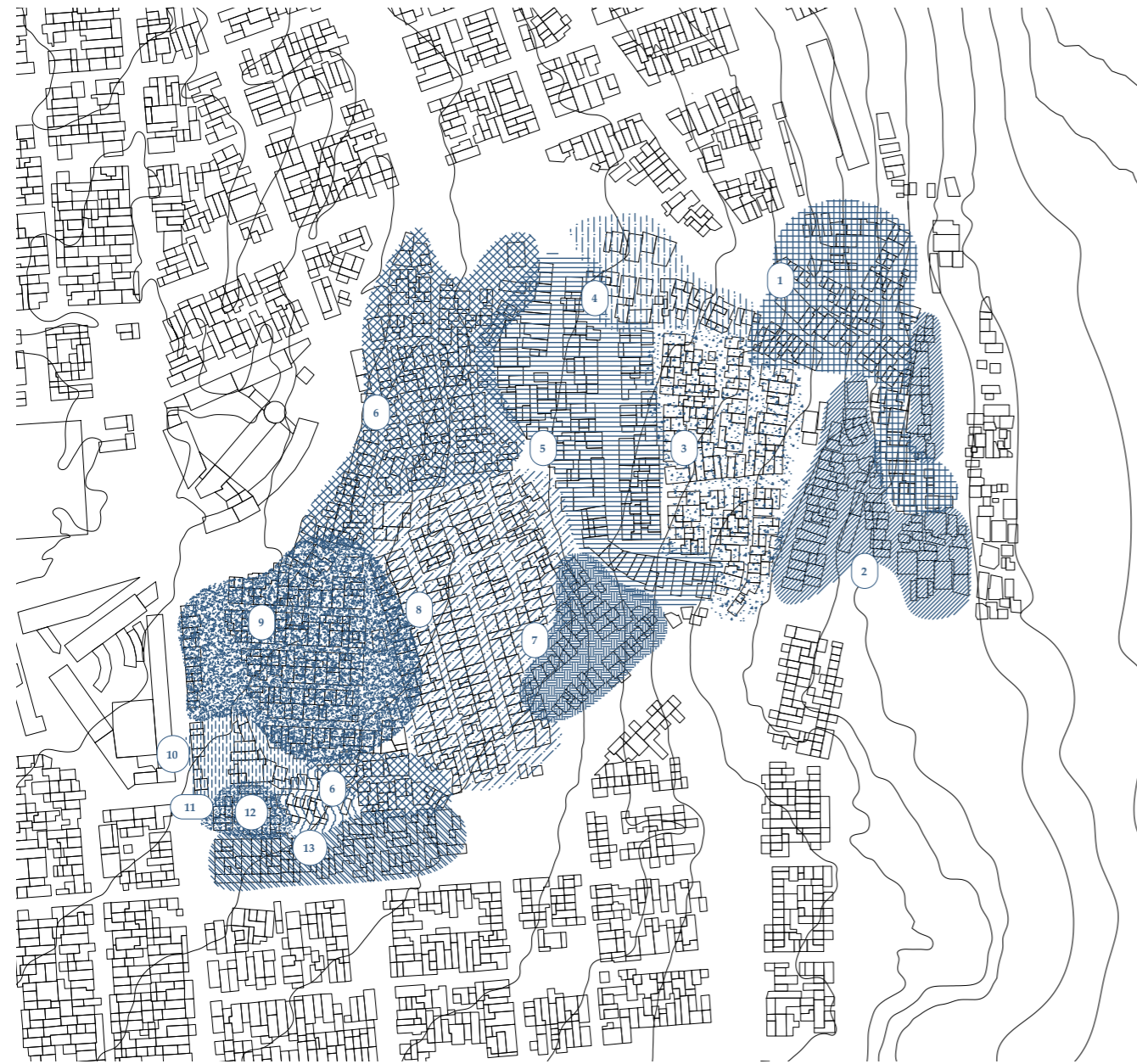
2013
Starting in 2013 on 11,4 ha of public land, Los Arenales grew rapidly.



2015
The biggest change happened by 2015, with an exponential growth.



2023
Today the settlement hosts over 2.200 families and continues to slowly increase.



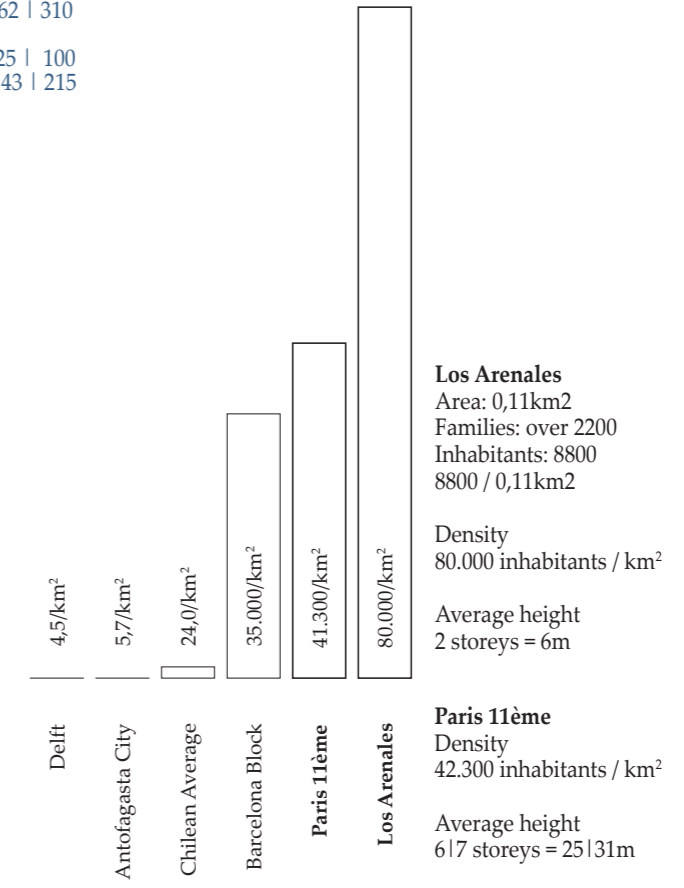
COMMITTEES

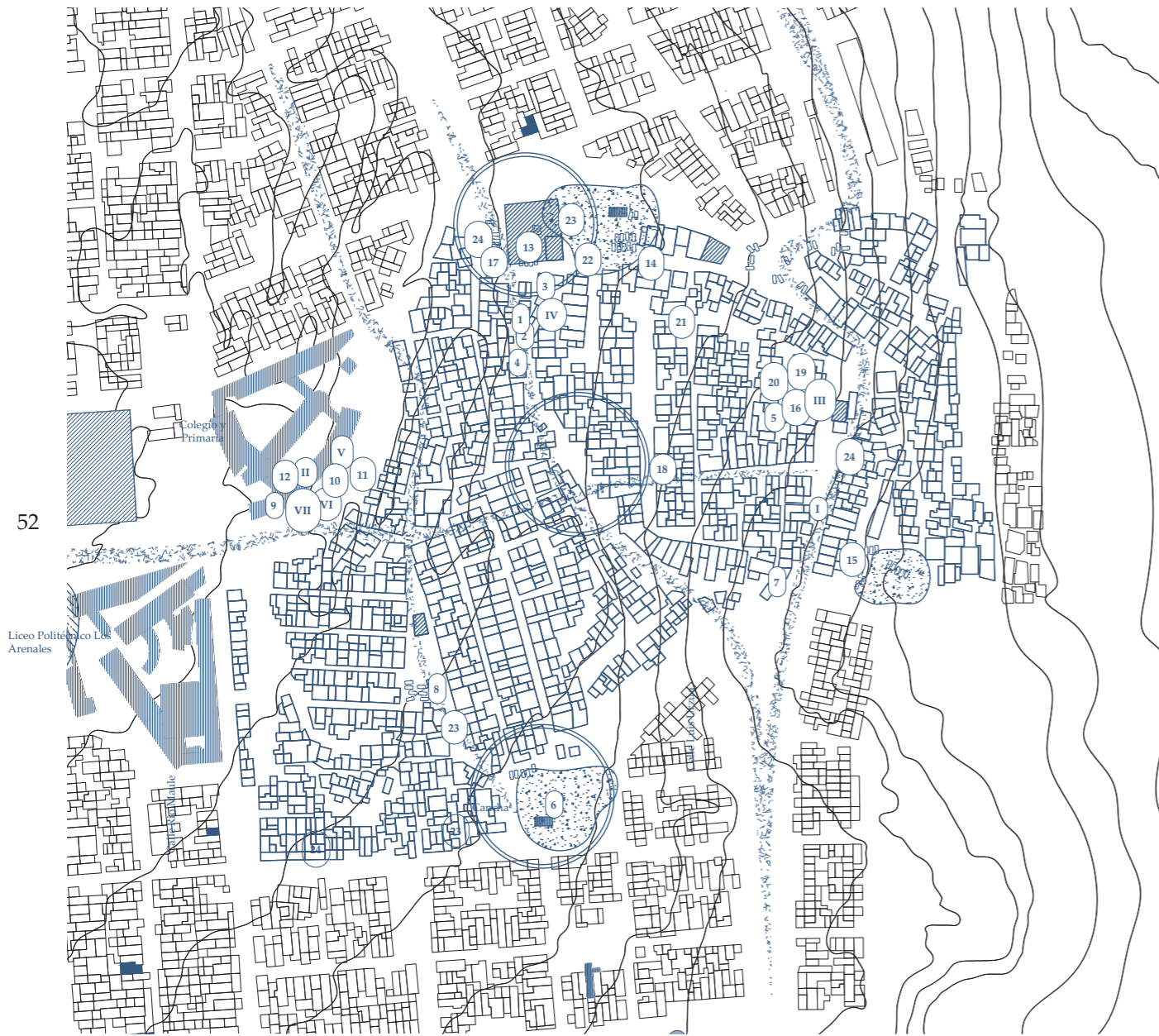
- 1. Nuevo Amanecer Latino
- 2. Rayito de Esperanza
- 3. La Unión del Norte
- 4. Rayito de Sol
- 5. Sueños de Esperanza
- 6. Nuevo Sol Naciente
- 6. Chilenos Villa el Sol
- 7. El Ranchito
- 8. El Bosque
- 9. Desierto Florido
- 9. Garras de León
- 10. Eulogio Gordo Etapa II
- 10. Esperanza de los Niños
- 11. Eulogio Gordo Etapa I
- 12. El Encanto
- 13. Vencedoras

- 1. New Latin Awakening
- 2. Little Ray of Hope
- 3. The North's Union
- 4. Little Ray of Sunshine
- 5. Dreams of Hope
- 6. New Rising Sun
- 6. Chileans Sun's Villa
- 7. The little Ranch
- 8. The Forest
- 9. Blooming desert
- 9. Lions Claws
- 10. Eulogio Gordo 2nd Phase
- 10. Children's Hope
- 11. Eulogio Gordo 1st Phase
- 12. The Charm
- 13. The Winners (fem.)

families | people

113 565
122 610
183 915
68 340
141 705
19 95
090 450
104 520
167 835
77 385
57 285
43 215
62 310
25 100
43 215





SOME OF THE CURRENT SERVICES

- | | |
|--|-------|
| 1. Salon - Braids and more | Woman |
| 2. Nail Salon | Woman |
| 3. Little Cafeteria with not much to eat | Woman |
| 4. Sewing workshop | Woman |
| 5. Tailor | Woman |
| 6. La Casita | |
| 7. Garden from Nuevo Amanecer Latino | |
| 8. El Maná, productos de aseo y plástico | |
| 9. Restaurant | |
| 10. Barber | Man |
| 11. Food | Woman |
| 12. Banana Tree garden | Woman |
| 13. Waiting area | Man |
| 14. Open-air community meeting point | |
| 15. Huerto Invernadero | Woman |
| 16. Paint and mechanic shop | Man |
| 17. Colombian garden | Woman |
| 18. MiniMarket | |
| 19. Coffe counter | Woman |
| 20. Hairdresser | Woman |
| 21. Church | |
| 22. Big MiniMarket | |
| 23. Garbage points | |
| 24. Community Centre | |

HOMES IN LOS ARENALES BOOKLET

- I. E.A.
- II. B.I.A.
- III. J.
- IV. M.C.
- V. B.A, C., S.A.
- VI. J.A.
- VII. Je.A, D.A.

4.3. HARDWARE: THE BUILD MASS BUILT BY AND FOR THEMSELVES

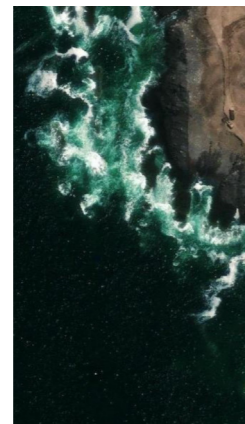
4.3.1. HARDWARE GENERAL: BUILDING INFORMALLY IN THE CITY OF ANTOFAGASTA

Although the city is known as “The northern pearl” and on the news its campamentos are ironically entitles as “The Chilean Dream,” they could be better described as ghettos of exploitation (Martin, 2019, p. 6). Antofagasta, observed from above, echoes the elongated and slender shape of Chile itself, tucked between natural confines, the Pacific Ocean on the western side and the Andes on the eastern boundary. Situated in the northern reaches of the country, the city finds itself bounded in by the world’s most arid desert, the Atacama Desert. Consequently, its parched and lifeless terrain contrasts with the vibrant hues of the surrounding waters. Gifted with a perpetually open sky, scarce rainfall, and minimal cloud cover, Antofagasta benefits from the ceaseless ocean breeze, affording its inhabitants an eternal, temperate climate, neither excessively cold nor oppressively hot. Despite this idyllic setting, the city, grapples with topographical challenges that hinder the construction of itself. The scarcity of flat land is conspicuous, as the mountainous terrain rises rapidly. Along the coastline, modern and covered in mirroring glass skyscrapers and a pedestrian-friendly waterfront contrast with the informal settlements climbing up the mountainside, attempting to establish homes on uncharted terrain. This juxtaposition encapsulates the pattern where the higher the elevation, the scarcer the resources and lower the financial means available to its residents. From any vantage point within the city, this paradoxical landscape is visible, a perpetual duality, offering a continuous two-sided view.

From west to east, from the formal to the informal city, the urban fabric changes in multiple occasions. Starting with a seafront walk that is under construction, with

large plant trees, and wide pavements the city the city continues towards the east mostly with the typical rectangular bloc made out of low rise row houses. The streets prioritize cars and barely have pavements. Further east, different typologies appear, like industrial hubs, either related to minery of other large scale business or even suburban-like neighbourhoods, with individual single houses, each with a garden and a pool, ironic in this desertic climate. The more east one goes, the higher in altitude, the more irregular and denser the blocs become at the same time as the houses become smaller. On the verge of the city, the campamentos start. Towards the east, the city always has grown from informality, what today is considered a neighbourhood, was ones a settlement. The dichotomy between the formal city with its luxurious skyscrapers covered in glass facades and the climbing campamentos made out community effort and the urge to fight create a dystopic image of the city. The city of Antofagasta, capital to the region, is marked by its topography, suffocated between the coast and the Cordillera de la Costa [the name of the mountain range], the in average 2,5km wide city grows in length. Throughout its 45km from north to south, over eighty-nine campamentos can be found on the edge, where the city ends, and the mountain begins. They host over 7.298 families, which represents over 30.000 people (Roldán, 2022).

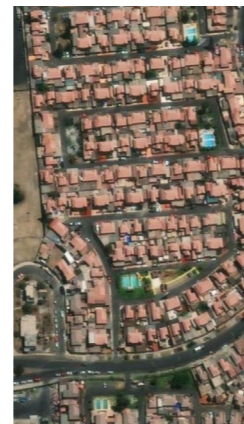
While the Chilean state has not formally declared the Borde Cerro [Mountain Range] as a hazardous area unsuitable for building, their actions suggest a stance against settlement on site. They refrain from granting permits or the rights to settle, citing safety concerns. This implies that the zone is considered risky for habitation. However, particularly towards the southern regions of the city, numerous instances showcase successful construction endeavours, suggesting that the prohibition on building is more driven by political agendas than a strategic approach to risk management (Martin, 2019, p. 45).



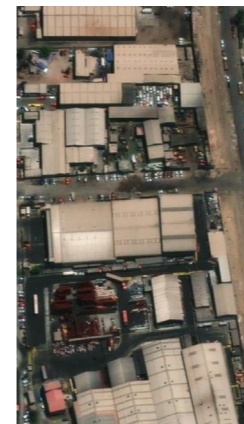
THE COAST



THE NEW BLOCKS



THE FAMILY HOMES



THE INDUSTRY



THE FUTURE CITY



LOS ARENALES

On the one side, the formal city with its newly build skyscrapers. On the other side, the informal settlements climbing up the mountain, in a very hostile ground where nobody else wants to build. Connected and yet separated.

56



-23.64628987424523, -70.401030266937

Desde la playa se vislumbra el crecimiento de la ciudad hacia la montaña. Cuanto más alto más precarias e informales son las construcciones. La cota de altura delimita el budget de sus habitantes (página anterior). From the coastline the growth of the city towards the mountain is visible. The higher the more precarious and informal are the constructions. The altitude defines the budget of its inhabitants (previous page).

57



-23.66282548490343, -70.38825895466542

Los tejados grises, los rasacielos de cristal y el océano azul (página anterior). The grey roofs, the glass skyscrapers and the blue ocean (previous page).

4.3.2. HARDWARE SPECIFIC: LOS ARENALES BUILDING ITS OWN CITY

Situated at the foot of the Borde Cerro, the name of the campamento Los Arenales translates to English as “The Sandbanks”, capturing the essence of its geographical location. This campamento resides upon a striking site marked by a thick layer of sand overlaying exposed rock. Its proximity to the Atacama Desert infuses the landscape with arid characteristics. Much like many other campamentos speckling the landscape of Antofagasta, Los Arenales occupies a rugged and uneven site, sprawling 11,4 hectares of public land (Arias Loyola, Vergara-Perucich and Vega-Rojas, 2023, p. 12). Within the nuanced tapestry made of uncountable diverse constructions lies a deeper connotation. As evoked by Mrtenbck the concept of a “house” transcends its definition. Houses are built by them; therefore, they represent the materialization of ownership and pride. With this, comes responsibility, because “long before the roof leaks, the paint peels [...] the house is a material thing, a process that requires attention” (Mrtenbck et al., 2015, p. 37). In order to do so, from the experts side a poignant layer has to be added to the discourse, advocating for a shift in architectural ethos. Were the focus form the allure of iconic structures must be redirected towards the primacy of everyday functionality fostering sustainable and harmonious living environments (Falú, 2023).

The residents themselves possess a deep understanding of their needs and priorities, which they easily translate into built structures, particularly the male population which tends to work in the construction industry. Despite this skill not being currently monetized within the campamento, it holds significant potential as a source of income and opportunity (Flores, 2017). This concept has already been trialled in Los Arenales, exemplified by the establishment of a cooperative bakery, CINTRA, led by female artisans, offering a variety of breads representing diverse Latin American cultures (Arias-Loyola and Vergara Perucich, 2020). Through the self-construction processes, they not only economize expenses of the whole house but also redefine their roles as creators of the city, fortifying their collective identity (Caldeira, 2017). Gradually transforming mere empty lots through collective efforts, the construction of their residences narrates compelling tales of resilience and perseverance. These sites are aptly characterized as “Spaces of Insurgence” by Holton (Holton, 1995). Consequently, take control and undertake the construction of their city and neighbourhoods, leveraging their expertise as builders. They determine the way they wish to reside and shape their surroundings according to their preferences. Collaboratively, they manage their spaces, fostering a sense of community governed by their own rules (Pérez, 2018, p. 516).

However, how did they build Los Arenales? Starting at night, to avoid potential eviction by law enforcement, the area is divided systematically, delineating clear street layouts and allocated to the new settlers. In a swift and intense effort, within just a couple of nights, more than 20 houses can emerge, creating a new campamento. At this initial stage, any available material, be it cardboard, tents, or wooden planks, is utilized within budget constraints. Often, the terrain may be

irregular along the Borde Cerro, necessitating the hiring of machinery to level it (Martin, 2019, p. 65). Over time, through collective labour, more durable materials gradually replace the light ones, such as concrete or welded metal structures. The duration of this progression varies, spanning from days to weeks or even months, contingent upon the families’ resource availability. Notably, they rapidly arrange for basic services, a notable contrast to emergency housing provisions offered by the government or other organizations (Martin, 2019, p. 48). In such cases, structures are constructed within a day lacking essential amenities, with chemical toilets and minimal ventilation, often limited to a single window. These 20 square meter constructions aim to accommodate families, typically comprising four to five members.

On the left, Los Arenales. On the right side, a school. In the middle, the invisible and at the same time, visible border of how the municipality declares what belongs to the city and what does not. The straight line of pavement includes some people and leaves others behind.



V. RESULTS AND PROJECT PROPOSAL

Chile is a subsidiary country with most of its services privatized. Public services do not even cover the basic right to decent housing. The previously research broad and abstract social, political, and economic issues are also reflected in the more tangible field of architecture. In Antofagasta, as well as throughout the country, attempts have been made to create low-cost housing typologies and projects to accommodate all those not invited to participate in oppressive capitalist games. Analysing projects helps understand spaces, discern scales and dimensions, and grasp the reasoning behind different constructions. Examining low-cost urban renewal projects for vulnerable communities worldwide is a great way to learn from both successful and unsuccessful endeavours and understand the reasoning behind these decisions. Additionally, studying existing housing projects in Chile sheds light on how the country and its citizens have dealt with informality, unaffordability of the housing market, and incremental building. As a result of the fieldwork, this chapter also includes an in-depth re-tracing, analysis, and evaluation of the homes of the women with whom I spent the most time. These local case studies serve as the foundation for developing the principles that will guide my project. It is from these women that I gather all the necessary information to integrate into the design.

All the examples observed; international, national and local, are viewed through an architectural and spatial lens. Through this validated information upon which I base the design, it is easier to distance myself from the European biases and precedents that are deeply rooted in me. Ultimately, as the goal of this research is not to produce a final floor plan design, the adopted methodology and design process should be applicable to different contexts by adjusting the parameters and data. It is not so much about what I “like as a designer”, but rather what works for and with the community. In the complex context of building in self-built settlements is a very thin and blurry line that separates me as a designer from the inhabitants, users, and builders. This metaphorical, invisible division arises from my perspective as a foreigner in this place, lacking the authority or power to decide unilaterally how their future homes should look like. Yet, as an architect this line pushes one to bear the responsibility of being the expert in this field. Therefore, it becomes ethically challenging to determine where my research and design efforts begin and end. There is no final floor plan, but the design proposal is an accumulation of diverse typologies, opportunities and possibilities from which the inhabitants of Los Arenales can chose and build.

The following analyzed case studies can be found in “La Ciudad de Los Arenales - The City of Los Arenales Booklet”

5.1. CURRENT HOUSING TYPOLOGIES LEARNING FROM THE EXISTING

5.1.1. REFERENCE CASE STUDIES

BUILT SOCIAL HOUSING PROJECTS [WORLD]

PREVI, Lima, Peru
 Barriadas de Integración, Perú
 Aranya Low Cost Housing, Indore, India
 Incremental Housing, Belapur, India

HOUSING IN CHILE [NATION]

Elemental, Antofagasta
 TECHO | Emergency Housing
 TECHO | Definitive housing
 Consolida tu vivienda | Pequeños Condominios
 Basic Housing block
 Vertical Ghettos

5.1.2. RETRACING THEIR HOMES [LOCAL] LEARNING FROM THESEE WOMEN

E.A.
 X.
 J. AND D.
 M.C.
 B., C. AND S.
 J.A.
 B.I.A.

5.1.2. RETRACING THEIR HOMES [LOCAL] LEARNING FROM THESE WOMEN

The campamentos can be glimpsed from almost any point in the city. One doesn't know where one house begins and the other ends. The image of the city is constantly changing because construction never stops, expansion never ceases. There are fires, evictions, demolitions, but construction continues; there are too many people still in need of a home. There is no norm or rule that can define the houses; they are built with whatever is found, with what little can be bought, and with overflowing creativity. One thing that is unanimous throughout the city is that among the neighbouring residents, there is a kind of understanding; there are not extremely small or large houses. An attempt is made to maintain a system of streets and open spaces. In general, the neighbour is respected, there is no grid but some sort of city-system. They try to ensure that the streets are wide enough for cars to pass and that there are parking spaces available. Each house is unique, of a colour, material, constructed in a specific way and at a different time from the neighbour's. This makes it very difficult to learn from what exists because there is too much versatility. It should be added that, to avoid intruding too much into a family's private sphere to rigorously analyse their home and cause discomfort or unease, only the houses of women in the Arenales with whom I spent time, had open conversations, and who invited me in, have been considered.

In housing committees, the leaders fight to maintain this, to ensure that common areas are respected; it's not something that arises from the charitable souls of each individual. It is these women who are also more willing to speak with me, who are more open, and who express themselves better. It's worth noting that yes, there were also participating men, and their testimonies have been summarized under the name of their partner, as they were always someone's husband. It was also very interesting to discover the change in tone when speaking with a woman or a man. Women spoke in plural, cared for the community, thought about others, whereas men, in a generalized manner, focused more on the singular or solely on the immediate family nucleus. This small and almost insignificant detail in language inspires us to continue putting them at the centre, as they bear the weight of the community on their shoulders and deserve a built space that embraces them

5.2. SCALES OF INTERVENTION

The development of various typologies as outcome of this research is not merely based on their anecdotes and their stories. These conversations on site, meeting the women and spending time with them, nourished the datasets out of which the quantitative parameters can become a housing typology. The imperative within this context is to preserve and uphold the uniqueness of each resident's dwelling. Ultimately, it is everyone by themselves, who, through conversation and visuals, shape and designs Her own Home. Still, to be able to design a dignified house, it is not only necessary to consider the number of rooms or the construction material; one must propose possibilities for how to distribute and connect these rooms and these materials. Out of the conversations with many women, needs and dreams were written down. A compilation of their parameters (such as the number of inhabitants in each house, their cultural background, their pride in self-building, the needed rooms and functions as well as their dreams and hopes for a better home) combined with the learnings from the case studies are the driving force for my design. Therefore, as an architect, I suggest a couple of rules or standards from what I learned on site, the in depth case studies analysis and my expertise as an architect, organized at different scales. Working in a scalar way allows for more attention to detail and a thorough understanding of all elements, from the body size of the women in the settlement to the city of Los Arenales as a whole.

1:1

I. THE BODY SCALE

Starting from the smallest scale, the physiology of the end-user, especially the women, will be considered to tailor the housing design. Depending on the ethnical background body sizes change. As mentioned, over 80% of Los Arenales population is migrant, coming mostly from other nearby Latin American countries. To develop the new body scale, average female heights from Peru (154cm), Colombia (157cm), Bolivia (155cm) and Chile (159cm) have been considered (World Population Review, 2024). While still being different, they are averagely smaller than for example the Netherlands (170cm) or even Spain, my home country (162cm). By considering this, La Formula is made from the different measurements from these local women ensures that the future typologies are created for these women specifically. The name Formula (a feminine word in Spanish) refers ironically to Le Corbusier's Modulor, while providing a new perspective. By looking at it from the opposite gender and making it more flexible with different body types, La Formula becomes a diverse and inclusive parameter. Out of La Formula in The Body Scale elements and spaces will be specifically adapted to these women. This could influence them feeling more comfortable and at home as the counter depth is adapted to their reach, the shelf to their height, and the corridor to their width and movements.

II. THE INTERIOR SCALE

The terms "labour" and "work" are often used as synonyms, yet they can also be understood under distinct meanings. Work might refer to the creation of tangible goods like furniture or buildings, representing the physical outcome of human effort and skill. On the other hand, labour encompasses a wider range of activities, mostly essential reproductive duties like sleeping, eating, childbirth, child-care, and housekeeping. This differentiation, rooted in philosophical ideas dating back to Aristotle and further developed by thinkers such as Hannah Arendt, emphasizes the essential difference between the productive nature of work and the often overlooked domain of reproductive labour. Arendt situates labour primarily within the household, defining it as the space dedicated to sustaining and perpetuating life. Despite its indispensable role, household labour is frequently undervalued and unrecognized. While in recent years, especially following the pandemic, the home has also become a site for productive work, traditionally and rooted in society there is a clear separation between these two realms. Generally, labour is associated with the private sphere of the home, distinct from the public sphere where work takes place. Existing, household arrangements often reinforce hierarchies based on gender, age, or other societal norms, leading to unequal distribution of domestic responsibilities. Social expectations often dictate that not everyone in a family is expected to equally participate in household chores. To address these inequalities and create a more inclusive living environment, it is essential to rethink the design of domestic spaces, particularly those that are labour-intensive and less flexible, such as kitchens, bathrooms, and laundry areas. By centralizing these spaces within the home and making them visible to all household members, the burden of household labour can be shared more equitably. This not only acknowledges the time and effort required for these tasks but also ensures that women are not relegated to the background, but rather actively engaged in all aspects of family life. This necessitates a departure from rigid spatial configurations towards more adaptable layouts that prioritize functionality and accessibility. One approach to achieving this vision is through the integration of large, flexible openings between rooms, facilitating fluid movement and interaction within the household. By centralizing traditionally hidden spaces such as the kitchen or laundry room, these areas can be brought to the forefront, challenging the invisibility of domestic labour and fostering greater transparency within the household. Furthermore, considerations for enhanced ventilation and natural light can mitigate issues such as poor air quality and inadequate sunlight, fostering healthier and more liveable environments. By leveraging existing architectural features and embracing innovative design solutions, households can evolve into centres of activity that reflect the diverse and interconnected people's labour and life.

The sizes and shapes of the interior layout and possibilities of the house configuration have been developed out the analysis of the existing constructions and the interviews with the local women. By being there and retracing the spaces, average measurements and need in the interior were taken.

1:25

1:100

III. THE BUILDING SCALE

In Los Arenales, houses are predominantly constructed using scraps. Over time, these structures undergo improvements, with surfaces being refined, roofs sealed, and walls painted. However, starting a project with such limited resources often results in a shortage of appropriately utilized materials and precise finishes. Conversations with the women revealed the common desire to complete their houses without necessarily needing larger or brighter rooms; the primary focus is on achieving a proper finished look and quality. Meaning, a simple but still thought through typology is aimed. This cannot be very labour intensive to avoid being left unfinished..

From time to time, the inhabitants hire one another external expert for specific tasks, like welding together a large metal structure for a multi-story building, like in the case of Blanca, Carne and Salomé or installing sewage systems to meet hygiene standards, like B.Idalia. Generally, the residents possess the knowledge, skills, and craftsmanship necessary for construction. This is an important consideration because it implies that if one were to do everything alone, there would be limitations, particularly concerning sizes, weights, and the tools to be used. The design proposed for the structural part is based on dimensions derived from beam profiles available in stores like Sodimac or Easy, construction material shops accessible to any citizen. Not only has the accessibility and price of construction material been considered, but also the dimensions. It's calculated that the longest beams can be carried by a maximum of 2 women of 155cm in height. Designing with these restrictions ensures that the house can be constructed correctly following the construction manual (See Building Process – not attached now). Furthermore, there are basic construction elements of the unit that can be prefabricated, such as the main double columns or the party walls between neighbouring houses that act as bracing. Once the load-bearing part of the house, the main structure, is secured, individualization can begin. Using recycled materials, urban mining from their previous house, found elements, or, if they can afford it and need to, new materials, they construct the facades and interior partitions. Attaching the facade and other elements is straightforward and follows the same principles as the load-bearing construction: first, a wooden frame is assembled on a horizontal surface, then it is raised, and cladding is added. Furthermore, to complete the facade, two vertical profiles are affixed to each edge. These profiles support the newly attached facade and can serve as anchors for additional elements, such as a canopy, a small sunshade, or decorative features facing the street. Ultimately, due to the variety of available materials, each house will exhibit a distinct appearance, not only in terms of floor plan, as determined by the diverse needs outlined in "The Interior Scale," but also in exterior aesthetics. This departure ensures a departure from the concept of cookie-cutter social housing designs that churn out inexpensive homes in mass.

Each house begins with a base of 6 units (3x3m), of which a maximum of 5 (45m²) can be constructed to allow for a courtyard providing light and ventilation. These potential 5 units can be expanded to a second floor, enabling the family to expand to up to 90m². Despite the potentially small housing footprint and low-rise development, the neighbourhood boasts very high density. With housing blocks containing up to 40 rowhouses, totalling 120m of facades, there is a density of 7.400 inhabitants per square kilometre, assuming an average household size of 4 people. As a general principle, the project outlined in The Building Scale advocates for low-rise, high-density housing design with room for expansion while avoiding overcrowding (Aravena and Iacobelli, 2013, p. 20).

As a conclusion, from the project's side, a house is delivered, the bare structural elements, that are self-built, to be able to inhabit the space. Still, incremental does not mean to leave half-built, it has to be thought through and designed. Therefore, the further extensions and work on the house have suggestions and guidelines, there are proposed ideas and typologies. At the end of the day, it will still be them who makes a home out of this house.

IV. THE CITY SCALE

National and regional authorities mandate its inhabitants to form groups and establish committees to be able to participate in the processes fighting against their housing struggle. This communal grouping becomes pivotal in their daily lives due the necessity for a supportive community. The Committees not only heed the authorities but also demand their needs and rights, fostering a dialogue and negotiation, which must be equally accomplished on both sides . Now a days, in Los Arenales each inhabitant of the community pays a small monthly amount, for the leaders to take care of everything. Becoming the head and spokesperson of the community is these women's job. With the communal money, they get a small salary other expense paid, such as bus trips to the municipality, printing flyers and information or a laptop to be able to work for the community. Through time, these leaders change, especially the ones managing smaller communities, as they do not require so much time nor expertise

Returning to the official classification of a campamento by the government, the absence of essential services exacerbates the inequalities faced by these communities. The United Nations, in resolution A/RES/64/292, acknowledges the fundamental right to access safe drinking water. Despite this, residents of Los Arenales and many other campamentos endured months without running water, as municipal services were lacking. Forced to create their own water supply systems, they formed agreements with private enterprises to secure water access. Similar challenges arose regarding power supply, leading to recurrent fires due to inadequate

electrical connections. Enel, a private entity, intervened after extensive discussions with settlement leaders by installing electrical infrastructure, a role conventionally expected of governmental agencies.

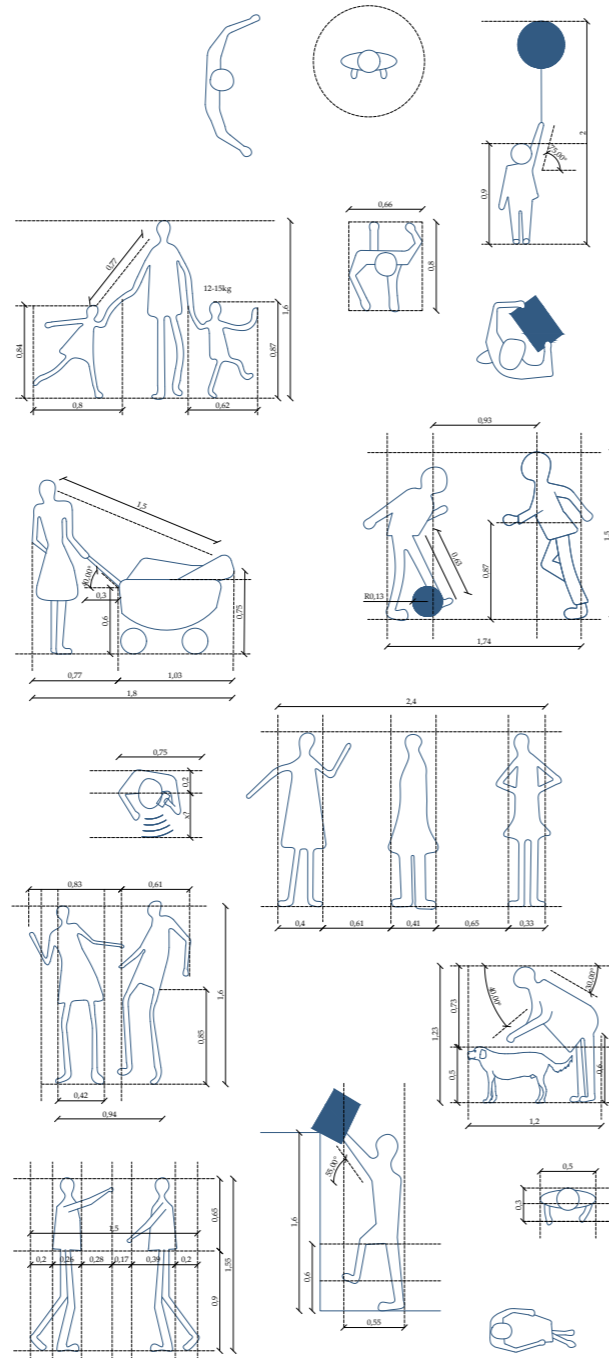
The initial step in the redevelopment of Los Arenales is the establishment of water, power, and sanitation systems to transition from the definition of a campamento to a neighbourhood. These services are installed on a city scale concurrently with the foundation for the houses. These processes require advanced machinery and on-site experts to ensure high-quality outcomes. The complexity of the slanted topography and the need for deeper foundations to reach exposed rock underneath, add to the challenges. All three services, along with the foundations and street layout, adhere to a strict grid layout that merges the current Los Arenales grid with the neighbouring formal city, creating a seamless transition. Hopefully in some years, there will be no more boundary between these two. A comprehensive analysis of the current urban landscape in Los Arenales and extensive discussions with community leaders have determined the plot size for “The City Scale.” While currently a fixed dimension, the use of a parametric model allows for potential adjustments to this plot size in the future. Each 6m x 9m plot (6 units in total) contains a home, collectively forming a city when arranged side by side. The research advocates for an alternative approach to social housing, challenging the monotony of current developments that result in dull and impersonal neighbourhoods. Despite maintaining a uniform plot size, these flexible and adaptable typologies differ in height, facade, and integration into the urban landscape. Various designs alter the private-public transition, introducing possibilities such as front-facing businesses, small gardens, urban facades, or urban furniture like benches. These diverse implementations ensure a dynamic street view that can be actively utilized by the community.

To accomplish the construction of these smaller elements and facades on “The Building Scale,” materials need to be sourced and organized. Introducing a material library and a cooperative-like flow of elements and craftsmanship can facilitate this process. Materials can be collected, organized, and shared among community members, fostering a non-consumerist, cooperative environment. This approach could be implemented within the Los Arenales community and potentially expanded to other communities. By doing so, government subsidies would be directly invested within the settlement rather than in an external construction company, ensuring that the redevelopment of Los Arenales not only addresses housing needs but also provides an economic boost by creating employment opportunities during and after the construction phases.

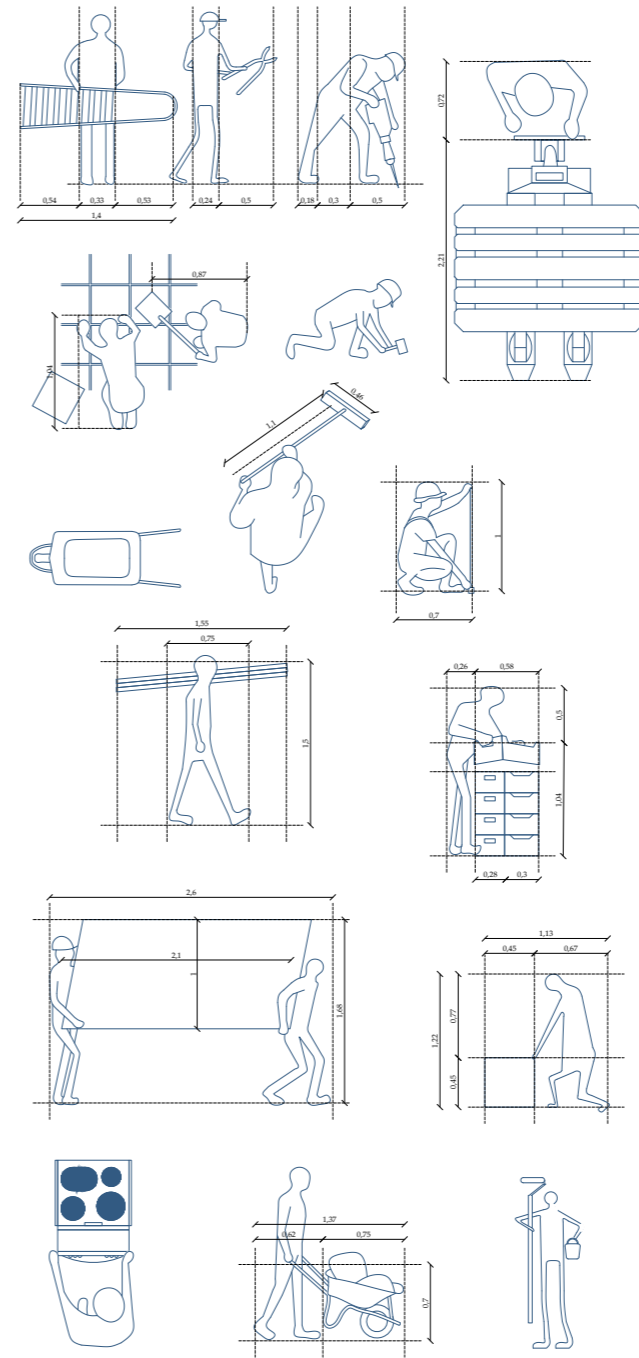
During and especially after the urban revitalization of Los Arenales, the risks of gentrification must be carefully considered. The residents have long fought for dignified homes, and if they have achieved them as part of their right to housing

and right to the city, they should not be displaced again. These houses now belong exclusively to the residents but also serve as a source of capital. Owning a property title means having an asset, and the house becomes an economic mechanism for overcoming poverty. By obtaining property rights, residents can accumulate capital over time (de Soto, 2000). While the initial investment may depreciate, the house as capital will appreciate, making it a more valuable investment. The construction of these homes has been financed with the assistance of governmental subsidies from the PEH (Schema investment in the house). To mitigate the capitalistic inclination to seek immediate benefits, long-term goals are proposed, such as completing construction within eight years from the start or prohibiting renting or selling the home for 15 years after completion.

**THE
BODY
SCALE**
MEASUREMENTS



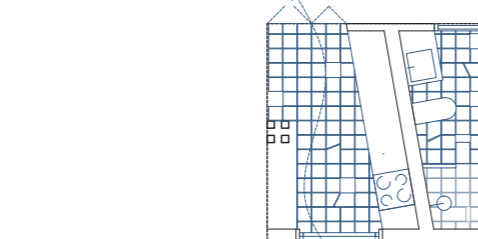
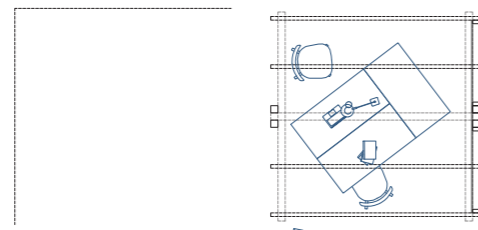
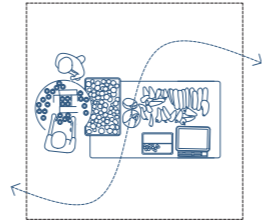
There is no fast walking pace, they enjoy time and life.
 This child with a long balloon is just a bit taller than the average dutch man.
 Children have to be held to cross the street and the span of the mother's arms is taken into account.
 They mostly use the phone on speaker mode. The length of the sound has to be taken into account.
 The reach and strength of arms to carry elements like books, boxes and trays is smaller.
 Three women talking to each other
 There is always a speaker on loud blasting music. Dancing is an important activity.
 Waving and talking to each other on the street.
 Everybody owns at least one dog. They spend the day outdoors, but always come back home for food and water.
 Reaching the top shelf can be complicated, elements and furniture have to be adapted.



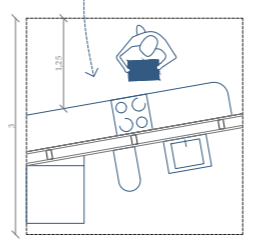
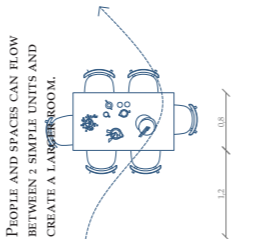
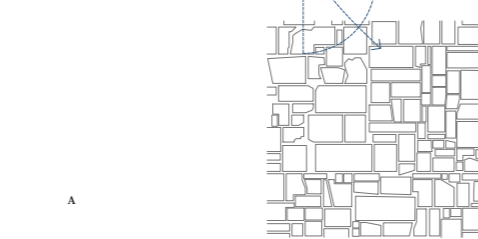
Power and strength are two factors related to the body scale.
 Carrying a box or a concrete block is not the same if one is 1.80m or 1.55 m height.
 Profiles have been adapted to the pieces available on the market.
 Larger elements have to be carried by two people.
 A maximum of 40 kg is encouraged to be pushed.

THE INTERIOR SCALE
Size and Function

**THE INTERIOR SCALE
SIZE AND FUNCTION**
THE SIMPLE UNIT CAN BECOME
A SMALL BUSINESS AS INCOME
GENERATOR

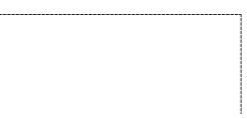
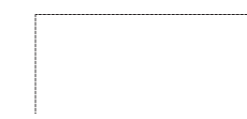
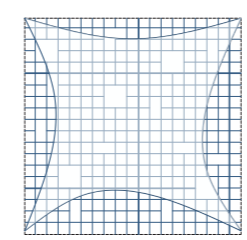
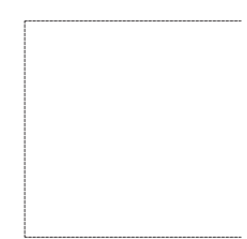
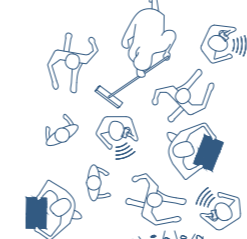
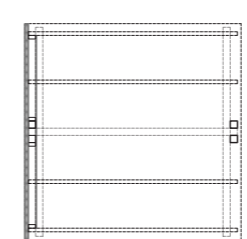
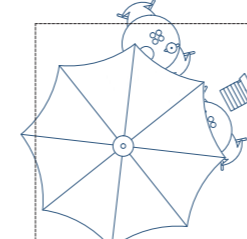
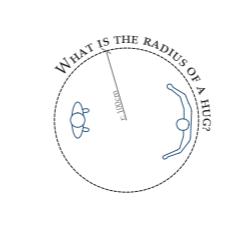
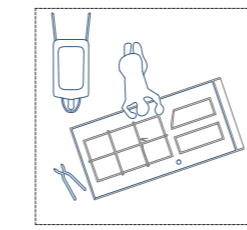
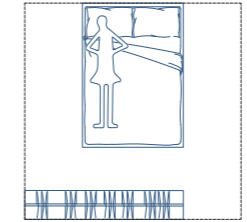
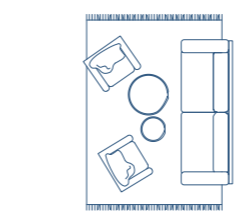


**THE INTERIOR SCALE
SIZE AND FUNCTION**
ANYTHING CAN HAPPEN IN A
3 X 3 ROOM, NO LIMITATIONS,
FREEDOM OF FUNCTION.

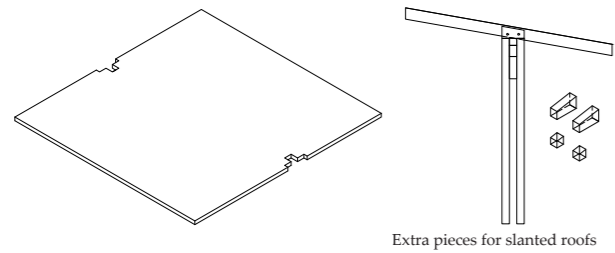


**THE INTERIOR SCALE
CENTRAL CORE**
CORE IS LOCATED IN THE CENTRAL
AXES OF THE HOUSE, FOR
THE CHORES TO BE SEEN FROM
EVERYWHERE.

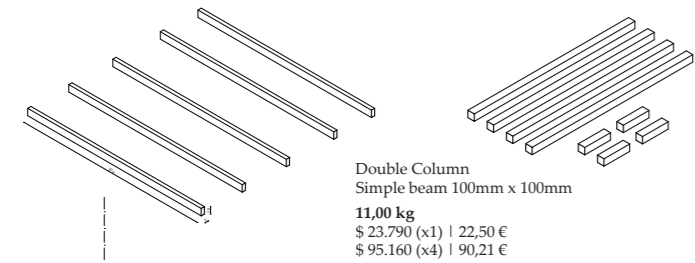
THE INTERIOR SCALE
Central Core



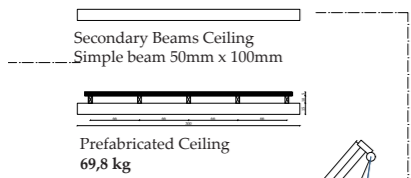
THE
BUILDING
SCALE
CONSTRUCTION



Extra pieces for slanted roofs

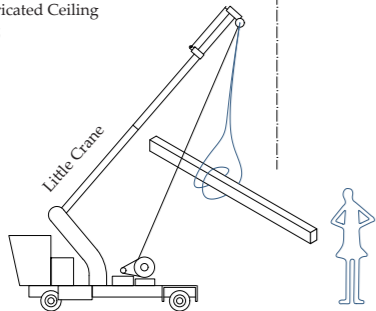


Double Column
Simple beam 100mm x 100mm
11,00 kg
\$ 23.790 (x1) | 22,50 €
\$ 95.160 (x4) | 90,21 €

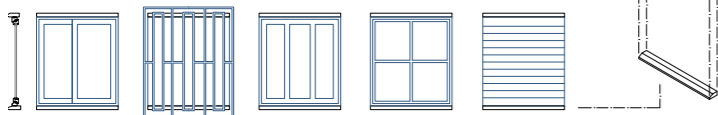


Secondary Beams Ceiling
Simple beam 50mm x 100mm

Prefabricated Ceiling
69,8 kg

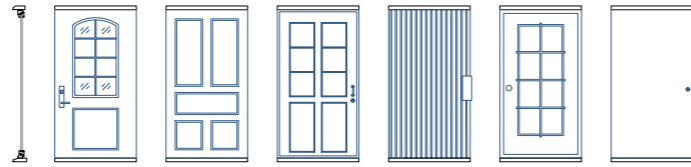


The Building Scale | Materials
Each house decides installs the windows and doors they choose, find, buy or have.



Windows
Different Windows - average size taken from analysis. More on Los Arenales Booklet.

The Building Scale | Patterns
The horizontal profiles at the bottom and top of the window (working as a line) also create the common language of the neighbourhood.

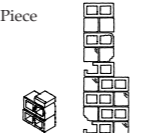


Doors
Different Doors - average size taken from analysis. More on Los Arenales Booklet.

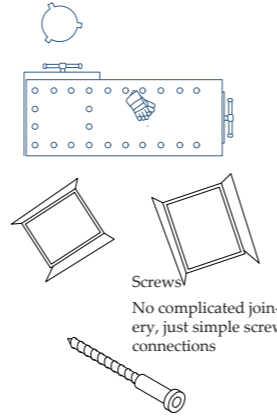
The whole construction is thought to be able to be built with easy tools, prefabricated in their workshops and mounted by the community.



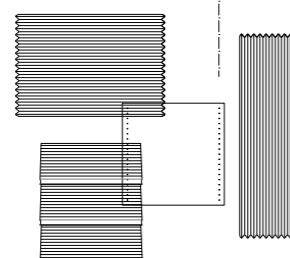
Column Connection Piece



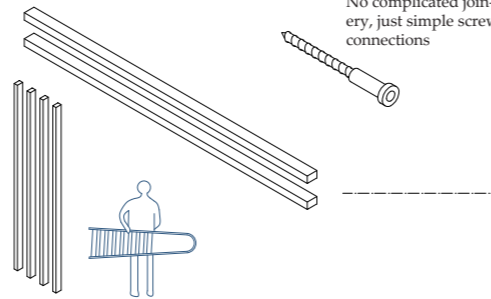
Foundation Concrete Block
1,6 € | \$ 1.600
40 cm x 20 cm x 20 cm



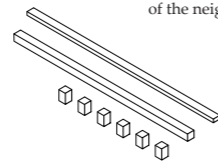
Screws
No complicated joinery, just simple screw connections



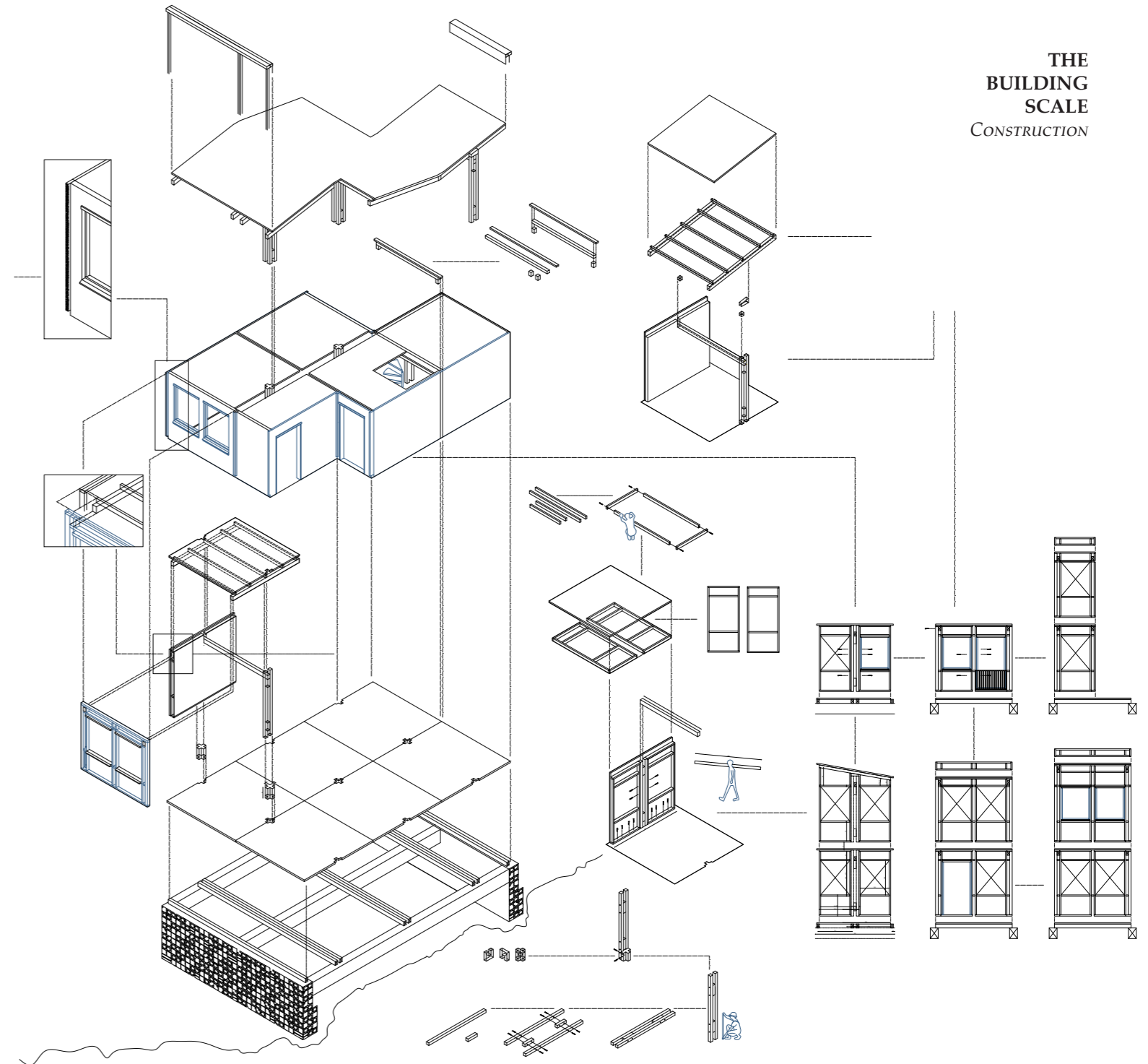
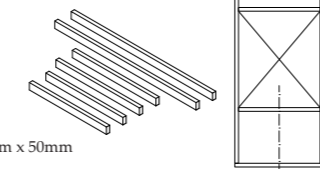
The Building Scale | Patterns
Cladding
Multiple materials, like these corrugated metal sheets can be used as cladding.



The Building Scale | Patterns
Vertical timber profiles extend from all facades, holding the different units together as well as creating the language of the neighbourhood.



Wall Frame
Long beam 100mm x 50mm
4,84 kg



CONCLUSION

In conclusion, this exploration of how to design social housing in the context of Los Arenales emphasizes a paradigm shift towards social and environmental sustainability, with a particular focus on the indispensable role women play within the community. Departing from conventional housing design practices, this research advocates for an empowering approach that not only acknowledges but celebrates the unique needs of female occupants. It challenges the historical neglect of such needs and aims to create a housing solution that blends soft parameters (relating to the inhabitants and their community) with hard parameters (related to the location, environment, materials, and craftsmanship). The research underscores the importance of diversity in housing typologies, moving away from uniform designs. By employing parametric design principles, the study seeks to create flexible and adaptable solutions tailored to the specific context of Los Arenales. The thematic research focuses on organizing vast amounts of data, utilizing rules and guidelines to control the complexity of information.

Ultimately, the expected outcome is an alternative methodology for social housing that is socially and environmentally sustainable. By leveraging data-driven design principles and prioritizing the unique needs of the women-led community in Los Arenales, the research aims to contribute to inclusive and sustainable housing typologies. The inhabitants' requirements remain central to this alternative approach, ensuring that the resulting designs meet the specific needs of the community.

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HER OWN HOME
SU PROPIA CASA

JULIA GARCÍA SANJUÁN

REFLECTION

Ambition

Reflecting on my current graduation project, the ambition set forth by the Studio Architecture Engineering was instrumental in shaping my approach. The directive to explore an innovative and technological aspect intertwined with a societal problem sparked my interest in finding a thematic topic that not only fascinated the field of architecture and the built environment but also resonated within a real-world context. Therefore, targeting a specific audience and purposefully applying architectural principles to address societal challenges.

How and why has my approach worked?

This dual approach influenced the methodology of my research rooted on the one hand in data collection techniques and parametric design (to enrich the architectural design process), and on the other hand prioritizing a social direction by putting the women inhabitants at the forefront of my project. Directly engaging with the women of the site, proved to be both fruitful and empowering, making the project more personal and meaningful. Acknowledging my role as an outsider to the context, I actively tried to bridge cultural and political distances by establishing on-site connections and collecting firsthand perspectives. This direct engagement enriches the study with valuable socio-political and economic insights, contributing nuanced perspectives to the architectural design process. As a whole, the information is gathered through a thorough literature review, from expert architects, activists, authors and more, as well as first hand narratives from the settlement, therefore, experts on their site, their context and their habitational situation.

It's important to clarify that my research is exploratory and experimental, aimed at pioneering a new approach to social housing design rather than offering a definitive blueprint. This perspective emphasizes facilitating a process rather than imposing a fixed solution. The copious amount of data develops into multiple possible projects, being my design proposal more of a tool kit and design guidelines

than an actual traditional architectural project. In this experimental framework, my focus remains steadfastly on the community under study, acknowledging the fluctuating parameters shaped by evolving needs and priorities. I exercise subjective judgment in selecting research participants and moments in time to capture the settlement's dynamics, recognizing that this approach provides a snapshot rather than an absolute truth.

Relationship GP and Master track?

The relationship between my graduation topic and the master track is characterized by an aspiration to pioneer an experimental approach to social housing design, emphasizing ongoing exploration over a finalized solution. The design aims to address contemporary environmental and social challenges within the community, presenting an innovative architectural response to complex issues. Throughout the project, priorities have evolved, maps have been redrawn, and new insights continually emerge, reflecting the dynamic nature of the research process. Therefore, there is no definitive solution, my design is more of a methodology, at the end, each woman decides and designs her own home.

Assess academic and societal values, scope, implication of the graduation project, including ethical aspects ?

Working closely with the community, the primary goal during on-site conversations is to promote understanding, bridge cultural gaps, immerse in daily community life, and build trusting relationships, ultimately generating knowledge through respectful interaction. Throughout this process, the validity of self-built construction methods and the residents' rights to remain and settle where their current houses and community are located are acknowledged, emphasizing a close collaboration. The conflict between the role of the architect and the local community, acknowledge as capable of self-building their community, has started a lot of conversations throughout the Research and Design phase with the different tutors. It is a blurry line that separates me, as a designer, from where they, as the inhabitants, users and builders, come into play. This metaphorical invisible division is drawn from the perspective of being a foreigner to the place and therefore not having the authority or power to decide unabashedly, while also bearing the responsibility of being the architect and therefore the expert in this field. Thus, it becomes difficult, an ethical question, where my research and design start and finish and where their appropriation start. My drawings are represented in 2 colours, the 2 sides of this one multifaceted project, them (in burgundy) and me (in black), working together.

At the end, this project has shown me to try to be clearer and more precise with my statements. Even if it is a collaboration, some architectural, structural and aesthetic decisions can be taken. While these could change or evolve throughout the processes, it is important to set priorities and positions to understand the project.

Date 14/05/2024

Architecture Engineering
Main Tutor: Lidy Meijers
Second Tutor: Gilbert Koskamp
Research Tutor: Dafne Swank

Influence of design and research?

Reflecting on the influence of my research on the design and vice versa, my exploration into housing, particularly through the lens of women in architecture and their housing needs, deeply informed the design process. The research was meticulously tailored to investigate the intersection of gender, data, and housing, enabling a design approach that directly addressed the unique requirements of women in the community. This focus on inclusivity and empowerment guided the design choices, emphasizing adaptability and simplicity without compromising on aesthetics. In response to the research findings, the design phase was influenced by a quest for a modular and repetitive architectural element that offered flexibility and adaptability. The aim was to design a construction that was possible to self-build, while integrating thoughtful design and aesthetic considerations. This iterative process ensured that the design solutions were not only functional but also responsive to the social perspectives uncovered during the research phase.

Transferability of my project?

Considering the transferability of my project, the alternative methodology for social housing design is envisioned as socially and environmentally sustainable. By centring on data-driven design principles and community needs, the research contributes to inclusive housing typologies adaptable to different contexts. The project's continuity is justified by its potential to redefine social housing paradigms, offering scalable solutions rooted in community engagement through data-driven innovation. If a different context was to be taken under study, the data just had to be updated, but the project proposal and methodology could remain the same, just adapted.

Own questions

Reflecting on this journey prompts essential questions about the impact and future of my work. What tangible impact does my design have on the community and broader architectural discourse? How can this project evolve beyond graduation, contributing to sustained innovation and positive change in social housing practices? The project's continuation is essential to honour ongoing community engagement and refine alternative methodologies that prioritize inclusivity, sustainability, and ethical design principles.

-23.6700631748654, -70.3902699103834

Mientras E.A. me cuenta sobre Los Arenales, dibuja, como una arquitecta y urbanista que lleve toda la vida haciéndolo (arriba). As E.A. tells me about Los Arenales, she draws, like an architect and urban planner who has been doing it all her life (above).

