Rethinking Typology in Taipei:

Designing New Frameworks for Urban Living

by

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Author’s Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners. I understand that my thesis may be made electronically available to the public.

Abstract

The Taipei streethouse is a typology that has been formed through a continuous dialogue with the local urban fabric and society. Since the typology was first brought over by Qing dynasty settlers from Fujian Province in the late 1600s, it has served as the archetype for family living and social organization. For three successive waves of colonization, the city of Taipei has been continually reshaped and revised in a fluid and incremental manner, with each colonial authority imposing their visions of the future on the island by reauthoring the urban landscape. Through this dialectic relationship with history, the streethouse type serves as a symbolic index in time, revealing socio-political changes, technological advances and shifting preferences that can be read through its architectural elements and spatial composition. Local residents transform formal structures through interacting with their homes: adding, subtracting, self-fashioning and re-defining spatial boundaries. Depending on the immediate needs of the local residents, their homes can be adapted to enable economic opportunities or remodeled to satisfy their changing spatial requirements. Transformations that are applied throughout an urban context form patterns that reveal how type is localized in response to its socio-political environment. The streethouse type can be seen here as an instrument to understanding the development of the city, and a source of cultural understanding linked to the past.

The modern streethouse, introduced between 1960-80, remains today as the dominant urban housing typology in Taipei. Despite its ubiquity in Taipei, these streethouses currently face obsolescence due to their poor physical conditions and lack of modern amenities. As a result, they are often considered undesirable housing options and their sites have become the primary targets for government-led urban renewal plans. Such redevelopment projects have begun demolishing entire city blocks, often with no consideration of the urban fabric or the communities that existed there before. The new architectural developments are globalized ‘products’ that can be recognized as multi-storey condominiums and gated communities. Their implementation has resulted in generic forms that are culturally detached from the sites upon which they are built. By directly engaging with Taipei’s unique historic context and the existing spatial practices dependent on the streethouse type, this thesis proposes a design method that learns from the morphology of the streethouse type and the role of local users in transforming it. Through an understanding of how the streethouse has developed in a typological process with its users, a series of design proposals will be generated to speculate new forms of flexible housing that will that reinforce existing socio-cultural and spatial dynamics.

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Introduction

The Taipei streethouse is a typology that has been formed through a continuous dialogue with the local urban fabric and society. Since the typology was first brought over by Qing dynasty settlers from Fujian Province in the late 1600s,[1] it has served as the archetype for family living and social organization. Family-owned shops on the ground level establish linear expanses of ding-a-ka or covered commercial corridors. Within each segment, public and private boundaries are blurred by diverse functions that extend from the interior of the building through to the streets. Food and kitchen stalls line the streets to form lively and aromatic markets during the day and night. Blocks of streethouses together serve as the unifying element for which economic and cultural life is organized in the city.

For three successive waves of colonization, the city of Taipei has been continually reshaped and revised in a fluid and incremental manner, with each colonial authority imposing their visions of the future on the island by reauthoring the urban landscape. Foreign ideals of urbanization, building construction and nationalism have contributed to the production of distinct streethouses that can be encapsulated through the following periods: Chinese administration under the Qing Empire in 1683, Imperial Japanese occupation in 1895 and Chinese Nationalist rule in 1945. Through this dialectic relationship with history, the streethouse type serves as a symbolic index in time, revealing socio-political changes, technological advances and shifting preferences that can be read through its architectural elements and spatial composition. Streethouse transformations can be understood as an iterative process where its spatial framework is implemented by an architect and then given meaning by its users through adaptation.

Local residents transform formal structures through interacting with their homes: adding, subtracting, self-fashioning and re-defining spatial boundaries. This process of adaptation is essential to the overall consolidation of the type, as the design of the building and its programmatic arrangements are dependent on its users. This flexibility is most evident on the ground level of a streethouse, where the interior “shop” spaces are free from pre-defined programs and are able to serve a multitude of functions. They can be converted into a family space for living and dining or an industrial facility for production and storage. Depending on the immediate needs of the

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1 *Jacobs, J. Bruce. “Taiwan’s colonial history and postcolonial nationalism.” In The “One China” Dilemma. Palgrave Macmillan, 2008: 38.*

Fig. 1.1 Aerial view of Datong District facing south of Taipei revealing a variety of housing types and exterior adaptations on the facade and rooftops.

local residents, their homes and shops can be adapted to enable economic opportunities or remodeled to satisfy their changing spatial requirements. Transformations that are applied throughout an urban context form patterns that reveal how type is localized in response to its socio-political environment. The streethouse type can be seen here as an instrument to understanding the development of the city, and a source of cultural understanding linked to the past.

The modern streethouse, introduced between 1960-80, remains today as the dominant urban housing typology in Taipei. Its formation coincided with a period of rapid urbanization and economic growth described as the "Taiwan Miracle"[2]. The modern streethouse was designed for mass production in order to provide a housing solution that could match the rapid urban population growth throughout the island. Its flexible organizational framework has enabled households to actively participate in remodeling their homes. The exterior adaptations and shop activities on the ground level together form a distinct modern vernacular that signifies evolving patterns of local solutions and cultural preferences.

Despite its ubiquity in Taipei, these streethouses currently face obsolescence due to their poor physical conditions and lack of modern amenities. As a result, they are often considered undesirable housing options and their sites have become the primary targets for government-led urban renewal plans. Such redevelopment projects have begun demolishing entire city blocks, often with no consideration of the urban fabric or the communities that existed there before. The new architectural developments are globalized products that can be recognized as multi-storey condominiums and gated communities. Their implementation has resulted in generic forms that are culturally detached from the sites upon which they are built.

In response to the crisis of type in Taipei, this thesis seeks to learn from and engage with the streethouse type to produce novel housing forms that will reinforce existing spatial and cultural understandings. Historic streethouse types and emerging housing variants developed in Taipei will serve as case studies which will be analyzed to reveal their organizational frameworks and how local adaptations have been made by its occupants. Each type provides insight on the evolving architectural strategies and approaches taken by architects to regenerate spatial patterns through the implementation of formal structures. They are each typological experiments that provide varying

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2 Gold, Thomas B. State and society in the Taiwan miracle. Routledge, 2015: 3.

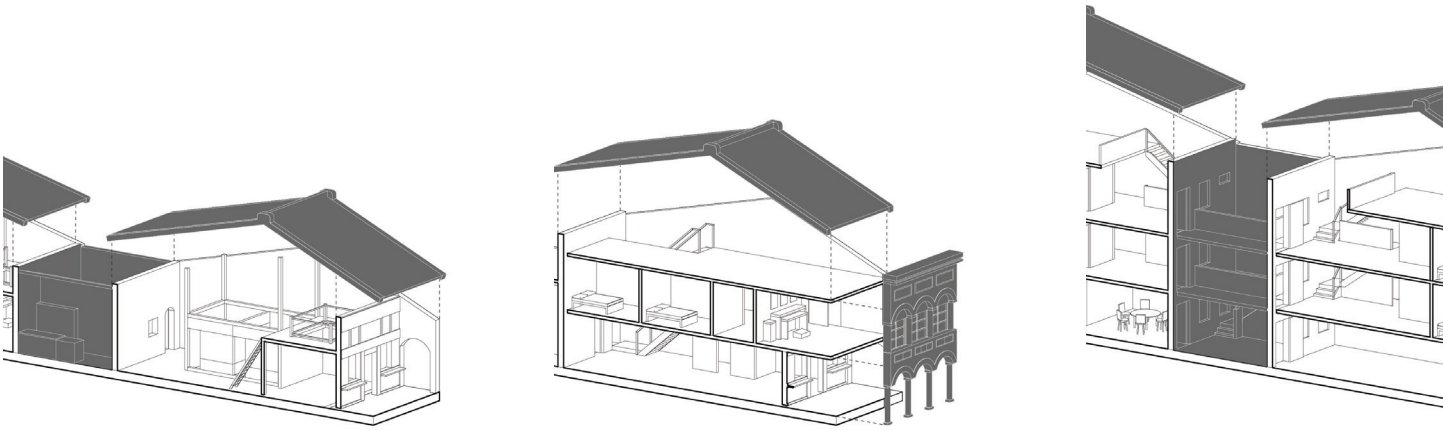
Fig. 1.2 Aerial view of Datong District facing Tamsui River. Early streethouses built during the Qing dynasty and Japanese colonial periods can be seen here by their clay tiles and arched rooftops.

degrees of adaptability and participation for its local users. Through an understanding of how type can be designed to support localization and existing socio-spatial relationships it will enable the generation of new architectural frameworks that can reinforce cultural dynamics specific to a local context.

The first half of this thesis is divided into four sections that will present: how the project engages theoretically within the type discourse, the co-development of the streethouse type with the socio-political shifts in Taipei, the localized spatial relationships enabled by the streethouse and the implications of its obsolescence. The second half of this thesis will present two design projects that explore a series of design methods and interventions on a streethouse block in Datong District in Taipei. The first design project examines an existing streethouse to reveal how it has been adapted by its users, its current deficiencies, and spatial organization. Through this research, a set of repair strategies that satisfy contemporary demands of access and functionality will be proposed. The second design project will present a series of design approaches which will together propose the iterative development of a new residential type on the entire block. This new type serves as a flexible framework that can be adapted spatially and programmatically according to future socio-political and economic demands. It is a new form that is produced through the understanding of existing social dynamics and work-live configurations that are enabled by the streethouse type. The two design projects will work together to speculate on scenarios that modern streethouses will have to confront: whether to repair or rebuild.

Fig. 1.3 A modern streethouse that has been localized by their owners through facade additions that provide shading strategies, protection from break-ins and a space for planting greenery.

Type Research

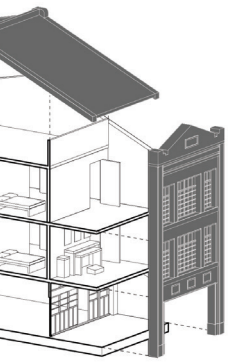


Minnan-style Streethouse

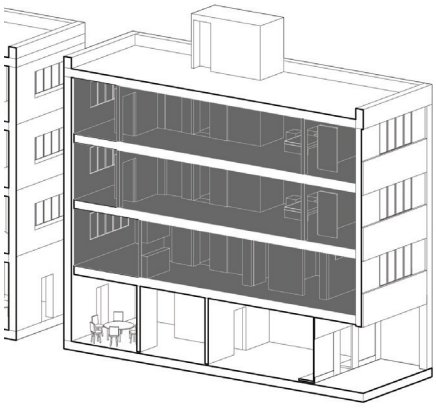
Japanese-style Stre

1683	*1895*	*192*
Qing Dynasty Chinese Administration	*Japanese Colonial Rule*	

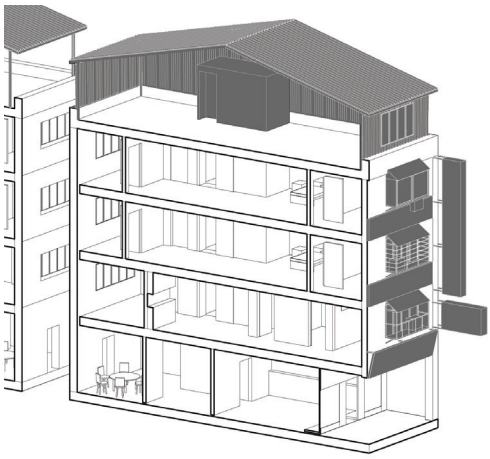
Fig. 2.4 Tracking the iterative transformations of the streethouse type through its colonial periods. Through each historical period, the streethouse has been adapted to serve colonial strategies for urbanization and localized by its residents.



ethouse



Modern-style Streethouse



0 1960 1980

Chinese Nationalist Rule (Kuomingtang)

Taiwan's Democratization

2.1 Theoretical Background

The role of typology in the architectural discourse has long been a contentious area of research and theoretical debate. The concept of type first appeared during the 18th century enlightenment period which saw theorists question if there was an underlying law or principle that governed how forms and their symbolic meaning were generated.[1] In 1832, Quatremere de Quincy described type as "the idea or symbolic meaning that is embodied in an element, an object or thing."[2] Through its recognizable forms, buildings and objects could be read and organized based on characteristics that describe their fundamental purposes.

In the 19th century, as architecture became a distinct discipline, the introduction of historicity influenced the notion of type. Types were understood as forms that are produced through a fundamental relationship between architecture and society. In "On Typology", Raphael Moneo described types as "a concept which describes a group of objects characterized by the same formal structure."[3] Formal structures, which can be understood as an underlying structure that formally organizes its parts, is produced through a continuous dialogue between the past and the present reality. This dialogue can be understood through a dialectic relationship between type and its "precise position in history."[4] Types reflect the ideological changes in society, technological advances and political events associated with its production. For Moneo, architecture "is not only described by types", but "also produced through them".[5] The concept of type implies a process of transformation through its repeated implementation and design by architects:

> "In this continuous process of transformation, the architect can extrapolate from the type, changing its use; he can distort the type by means of transformation of scale; he can overlap different types to produce new ones… as well as create new types by a radical change in the techniques already employed.

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1 *Lathouri, Marina. "The city as a project: types, typical objects and typologies." Architectural Design 81, no. 1 (2011): 24-31.*

2 *De Quincy, Quatremère, and Antoine Chrysostome Quatremère de Quincy. The true, the fictive, and the real: the historical dictionary of architecture of Quatremere de Quincy. Papadakis Publisher, 1999.*

3 *Moneo, Raphael. "Oppositions, on Typology." A Journal of Ideas and Criticism in Architecture # 13: 24.*

4 *Moneo, Raphael. "Oppositions, on Typology.": 24.*

5 *Moneo, Raphael. "On Typology, Opposition# 13.": 24.*

> The list of different mechanisms is extensive - it is a function of the inventiveness of the architect."[6]

At the beginning of the 20th century, the modern movement in architecture rejected the concept of type in search of a new image of architecture that was free from historical reference or precedent. Modernist architecture sought to reflect the industrialized world and economic ambitions for efficient reproduction. Le Corbusier famously stated that the model of architectural design "should be founded in the production process itself."[7] The result of the modern movement, however, did not lead to the end of a typal understanding of architecture, but led to the emergence of a new modern type that could be mass produced for growing urban populations. Such types provided standardized models that severed the dialectic that joined previous types with its site and history. The consequences led to the "fragmentation, decentralization, and formal disintegration"[8] of urban life, as argued by Anthony Vidler.

In reaction to the attack on the type discourse by the modern movement, architectural theorists in the 1960s began to revisit the theoretical role of types in understanding the development of a city. Saverio Muratori, a critic of the modern movement, describes in "Studi per una operante Storia Urbana di Venezia", that types are the basic elements that allows for an understanding of the patterned growth of city. Muratori developed a theory "that emphasized the organicity of urban form as a system; ordinary building types as direct representations of culture; and the evolvement of urban types over time."[9] Muratori's morphological approach demonstrated that urban cities can be understood as constantly evolving organisms that are generated through its individual typal elements.[10]

In response to the functionalist method for organizing and classifying type based on function, Aldo Rossi sought to describe a new method for understanding and studying urban cities. Building from Quatremere De Quincy's concept of type, Aldo Rossi in "The Architecture of the City" describes type as governed by a rule or structuring principle that is tied to the reason or purpose of its

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6 *Moneo, Raphael. "On Typology, Opposition# 13.": 27.*

7 *Corbusier, Le. Towards a new architecture. Courier Corporation, 2013.*

8 *Vidler, Anthony. "The Third Typology." Oppositions Reader. 1998: 15.*

9 *Chen, Fei, and Kevin Thwaites. Chinese urban design: The typomorphological approach. Routledge, 2018: 49.*

10 *Lathouri, Marina. "The city as a project: types, typical objects and typologies." 2011: 24-31.*

invention. The structuring principle is a constant that can be found in all types and urban artifacts that together form a city:

> "As a constant, this principle, which we can call the typal element, or simply the type, is to be found in all architectural artifacts. It is also then a cultural element and as such can be investigated in different architectural artifacts; typology becomes in this way the analytical moment of architecture and becomes readily identifiable at the level of urban artifacts."[11]

For Rossi, types are associated with a culture or way of life and are able to react "dialectically with technique, function, and style, as well as with both the collective character and the individual moment of the architectural artifact."[12]

The concept of type has evolved with its use by architects and theorists to describe cities and the development of its buildings. Each of the authors here engage with typology as an analytical tool to delineate the associations between architecture and its production, while reflecting on new understandings or challenges to the discourse associated with their time. Type can be understood here as an evolving formal structure that is produced and transformed through a dialogue with its past and present context. This evolution can be described as a typological process where events, history, and the context all serve as inputs causing types to adapt iteratively with urban life. Working with the typological process allows researchers to clearly identify how socio-political and economic changes have led to architectural change.

11 *Rossi, Aldo. The Architecture of the City. The MIT Press, 1984: 39-41.*
12 *Rossi, Aldo. The Architecture of the City. The MIT Press, 1984: 41.*

Fig. 2.5 A two-storey streethouse in Datong District adapted with rooftop and facade extensions made of metal bars and corrugated steel sheets. These are commonly made low-cost methods of extending the interior and exterior spaces, while improving the functionality of the buildings.

2.2. Local Citizens in the Type Process

As discussed above, type is a concept that implies a continuous transformation, and according to Raphael Moneo, its production is a function of the "inventiveness" of the architect. However, this thesis questions: what is the role of local citizens in transforming and further designing type through their spatial practices? When a type is evolved by its users to become compatible with a local context and socio-economic needs, does it become a differentiated version or a new type? What can architects learn from the socio-spatial relationships formed as a result of the user-led adaptations in designing future frameworks for organizing urban life? How can we reinforce and strengthen these socio-spatial relationships that are vital to the local identity of a place through the design of a type?

It is argued that local citizens are essential operators in the type process: as both users and designers through their ability to adapt and localize buildings. The process of localization can be defined as the adaptation of a space or building by its users to fill the needs of a specific culture or locale. Local users engage in the design process through an interaction with formal structures by self-fashioning and re-defining spatial boundaries. These interactions reveal the life of a building after its construction as it evolves with its users. John Habraken, in "Supports: An Alternative to Mass Housing" describes the interaction between users and their environment as a natural relationship: a "relationship that arises from the most common actions of daily life… rooted in the foundations of our existence."[13] While critically examining the social rigidity produced by mass housing models, Habraken emphasizes that contemporary dwellings should be designed to support human actions that will allow for self-expression and participation.

The typical role of an architect today is limited to the design and construction timeframe of a project. The architect devises a scheme that considers the clients demands while working within a set of regulations of a given region. The architect determines the spatial framework, programmatic distribution and how the building will materialize aesthetically. They draw the boundaries that divide what is public from private space, and prescribe how they might function programmatically. The role of the architect is therefore to transcribe

13 *Habraken, N. J. Supports: An Alternative to Mass Housing The Architectural Press, London, 1972: 18.*

Fig. 2.6 Aerial view of a series of modern streethouse rooftops that form additional apartment units, terraces and platforms for water tanks.

the existing dialogue formed between type and the existing demands of society into the implementation of an architectural framework. When the building is constructed, its users begin a continuous process of adapting the architecture through their daily spatial practices. This process of localization allows for local identity and cultural values to be incorporated into the development of a type.

Adaptations can be created through physical changes by: furnishing, changing the interior layout, renovating the exterior façade, and constructing additions. They can also occur through the re-shaping of physical and non-physical boundaries as defined by the architect. Boundaries that define the public-private or live-work realms can overlap, blend, and create new gradients dependent on the activities carried through the type and its surrounding context. The degree to which a building might be localized depends on its flexibility and the level of participation permitted by the architecture. An open framework allows for the users to easily adapt spaces in response to their changing preferences and needs. A closed framework is a finished and fixed solution that provides limited opportunity for re-configuration.

When a spatial framework is adapted continuously over time, its changes provide insight into both the deficiencies and potentials of a given type. Adaptations can be seen as a method of evaluating the existing state of a type by its users and owners. They are completed in order to solve an existing issue or satisfy the changing demands of its users. Adaptions can be produced to both counter the natural deterioration of a type due to aging or to enable spatial requirements specific to a local context.

Through studying the underlying causes for adaptation, architects can better learn from and evaluate: 1) the enduring formal structures and spatial dynamics that are continually produced in each variation of a type; 2) the ability of a type to support existing socio-spatial relationships and local practices through their spatial framework; 3) how pre-defined boundaries have been re-drawn and interpreted by its users to produce new gradients of programs and functions. By utilizing the knowledge learned from adaptations and the processes of localization, architects will be able to evolve and produce future types that can enable and strengthen the social dynamics that are specific to a local context. Doing so will allow the creation of meaningful spaces that challenge existing ideological or spatial incompatibilities that have been introduced by modern capitalist forms.

Fig. 2.7 View within the 'ding-a-ka' of preserved Minnan-style streethouses in the Bopiliao Historical Area lined with red brick and clay tiles.

Fig. 2.8 View inside the segment of a Minnan-style streethouse on Dihua Street that is being restored and preserved.

2.3 The Evolving Formal Structures of the Streethouse Type

Walking through the historical neighbourhood of Datong District today reveals a chronology of streethouse typologies as they have evolved along the Tamsui River. Within Dihua Street, historically preserved streethouses tell stories of Taiwan's colonial history and provide insight as to how urban life was once organized. Each colonial period led to the transformation and production of new streethouse variants, which were then adapted and localized by its users. This following section will illustrate the formal structures of the streethouse type as it has evolved, while highlighting how each socio-political shift maps to a series of architectural transformations.

Within the boundaries of Datong District, there once existed a prosperous commercial centre known as Dadaocheng, which translates to the "great grain plaza". Dadaocheng served as one of the two major trading ports along the Tamsui River, which saw imports and commercial activities flourish during the Qing Dynasty. Bangka, located south of the Tamsui River, and Dadaocheng became the first locations where Minnan-style streethouses were constructed by Han-Chinese settlers that migrated from the Fujian Province.[14] This event marked the first major period of urbanization on the island, where streethouses formed dynamic multi-generational living units that served as a scaffold for urban functions.

The Minnan-style streethouse typology, also known as qilou, is recognizable throughout East Asia, as a framework for urban organization. As a variant of the *si-he-yuan* courtyard type from Southern China, the streethouse developed a long and narrow form through its axial alignment towards commercial trading ports, where family-owned shops would distribute and trade goods. The five-metre width of each home ensured equal access to the economic and transportation activities along the harbor. Imported goods would be delivered to the back of the streethouses and sold at the front where major commercial streets were established.

The architecture of the streethouse is recognizable through its *ding-a-ka* or covered entrance to the shop, which together with neighbouring units, form an urban corridor along the streets. It responds to the sub-tropical climate in Taipei by providing a sheltered path under its extended roof that shields pedestrians from the rain and sunlight. The urban corridor that is formed between the storefront and

14 *Knapp, Ronald G. "Chinese Frontier Settlement in Taiwan." Annals of the Association of American Geographers 66, no. 1, 1976: 43–59.*

Fig. 2.9 View of streethouses from each colonial period on a single block in Dihua Street. The rooftops of Japanese-style streethouses are lined with red clay tile, whereas the modern streethouses have rooftops made with colourful corrugated metal sheets.

Fig. 2.10 Early Japanese-style streethouses in Daxi Old Street in Taoyuan reveal intricate ornamentation learned from the West on its facade. Each stone carving here symbolizes the meanings associated with the families that live within the streethouses.

its exterior columns create a communal space that blurs the public and private realms. Family life and shop activities are able to expand from the interior through the *ding-a-ka* onto the streets. Shop displays, food carts, dining tables occupy the *ding-a-ka* to create social spaces where customers and residents would interact.

The Minnan-style streethouse is composed of a series of work-live segments separated by courtyards that allow for natural ventilation and sunlight to penetrate its structures. An individual segment is made of a wooden structure that can be adapted programmatically to any living or working arrangement depending on its furnishing. Segments that face a street are commonly adapted for commercial activity, where shop functions would occur on the ground level and inventory is stored in a mezzanine above. Living spaces are created through wooden partitions that create enclosed bedrooms against a structural wall. The leftover spaces are used for family activities such as praying, dining or entertainment.

The organizational framework of the Minnan-style streethouse allowed for families to grow their homes through adding segments along its linear-axis or horizontally along its street-axis. The segments are formal structures that would grow according to economic opportunities or demographic demands. Commercial segments would develop to create space for growing business activities and living segments would be added to accommodate multiple generations of a single family. The courtyards that divide the streethouse segments provide outdoor circulation spaces that contain latrines or outdoor cookhouses. Together the segments and courtyards formed a hierarchy of spaces that would organize urban life along the streets of Taipei.

As the frequency of travel and interactions with foreigners increased, the storefronts of the streethouses began to evolve and adopt ornamental qualities from the West. Families would replace their wooden facades with stone engraved friezes that displayed family names, as well as European neo-classical symbols. This process of streethouse adaptation through its flexible arrangement and materiality would continue through the next periods of colonization, which saw Dadaocheng, and Bangka transform into the modern metropolis of Taipei.

From 1895 to 1945, Imperial Japan invaded and sought to establish Taiwan as its colonial capital through an intensive urban planning campaign. This event marked the second major urbanization of Taipei, where the city was re-engineered with modern infrastructure,

Fig. 2.11 A series of streethouses in Datong District with colourful corrugated steel rooftop additions that are used for outdoor domestic activities or rented out as low-cost apartment units. All of these additions are illegally made and cause fire-safety issues.

Fig. 2.12 A steel cage extension outside the window of a streethouse unit being used for drying clothing and an umbrella outside. The facade here displays household items on the exterior to free up space within the interior of the streethouse unit.

transportation, and architecture. The Minnan-style streethouses transformed in this period to reflect changing technologies and preferences: wooden structures were replaced with concrete and brick, commercial segments grew to accommodate industrial functions, courtyards were made free from latrines and cookhouses due to the advent of interior plumbing and utilities, and the façade were re-designed to uniformly display a European neo-classical-style.

Despite the ambitions of the Japanese Empire to modernize Taipei, the streethouses in Datong District retained its segmental-courtyard organization. With the introduction of reinforced concrete, the Japanese-style streethouse segments were able to grow vertically up to three storeys, while maintaining its interior flexibility. Dadaocheng, during the Japanese colonial period, flourished with trade as the commercial centre of Taipei. Families involved in manufacturing scaled-up their production with new industrial technology. Goods such as tea and rice would be processed in machines and equipment that occupied multiple levels and segments of the streethouse. The internalization of industrial activities within the streethouse further evolved the type with new work-live configurations. Living spaces and family functions would be interspersed above the commercial spaces or into a separate segment altogether. The courtyard unified the segments and each level through open-air corridors and stairs.

The Minnan-style streethouse archetype, which migrated to the island with Chinese settlers, experienced two major transformations during the Qing Dynasty and Japanese Empire from 1683-1945. The major formal structures that endured were the *ding-a-ka* that served as the commercial spine of Dadaocheng, and live-work segments that were adapted to serve demographic and economic needs of local families and their businesses.

Following the defeat of the Japanese Empire in 1945, the urban morphology would continue to transform, reflecting major political changes as the island began to develop into a modern democracy by 1987[15]. As a result of the Communist Party victory in the Chinese Civil War, the Chinese Nationalist Party (KMT), comprised of over two million refugees fled to Taiwan and established a military dictatorship over the island.[16] Due to Cold War tensions and Taiwan's

15 *Tien, Hung-Mao and Chyuan-Jeng Shiau. "Taiwan's Democratization: A Summary." World Affairs 155, no. 2, 1992: 59.*

16 *Richard C. Kagan. Martial law in Taiwan, Bulletin of Concerned Asian Scholars, 1982: 50.*

Fig. 2.13 A six-storey streethouse with a variety of facade additions revealing the different approaches taken by the unit owners to customize their home. The facades can be seen as a mosaic of adaptations and expressions of each owner's preferences or creativity.

geopolitical proximity to China, the United States from 1951 to 1965,[17] provided financial aid and urban planning guidance to accelerate Taiwan's development into a modern nation.[18] As of result, the modern streethouse was developed in Taipei during the 1960s and would quickly proliferate to match the rapid pace of economic and population growth in the city.

At the beginning of the twentieth century, the modern movement in architecture sought to describe the world in a new way and create an architecture of the future that reflected the industrialized world.[19] The modern streethouse was thus developed as an architecture of mass production that could be rapidly assembled and repeated. The structural system of the modern streethouse is composed of reinforced concrete columns, slabs, and a single staircase, resembling Le Corbusier's Dom-Ino House. The floor plan on the interior is made free from columns as they are positioned around the building perimeter. A typical modern streethouse differs from its previous variants as they do not have interior courtyards and are no longer organized through linear segments aligned along trading routes. Instead, they are efficiently stacked four to five storey units that are connected to a ground floor commercial shop, which, together with adjacent units, form the perimeter of an urban block.

Despite its industrial scheme, the modern streethouse remained typologically linked to previous streethouse variants due to its ability to reproduce formal structures such as a *ding-a-ka* and flexible work-live arrangements. The modern streethouse maintained its scale and ground floor *ding-a-ka*, allowing it to fit within its past fabric. Its form fit within existing lots, and its height increased by one to two storeys due to building code restraints. Its adaptable framework allowed existing live-work arrangements to be sustained and thrive within its structure. The upper levels of the modern streethouse were designed to function as independent apartment units for single families, however these living spaces were able to easily expand vertically and horizontally into adjacent units through the removal of non-structural walls. This allowed new living configurations to accommodate changing household arrangements. The modern streethouse differs from the traditional

17 *Jacoby, Neil Herman. Evaluation of US economic aid to free China, 1951-1965. Department of State, Agency for International Development, Bureau for the Far East, 1966.*

18 *Lin, Jin-Ann and Liang-Chuan Chen. "The Modern Vernacular Reassessed: The Socioarchitectural Origin of the Taipei Walkup Apartments." Journal of Urban History 41, no. 5, 2015: 909.*

19 *Moneo, Raphael. "On Typology, Opposition# 13.": 33.*

Fig. 2.14 View of a series of modern streethouses that have been constructed to fit within the urban fabric of Dihua Street in Dadaocheng.

streethouse variants because it has abandoned the segmental-courtyard organization in favor of increasing its building density. However, despite this crucial difference, the modern streethouse can be seen as the next evolution in the streethouse type process, as it was formed dialectically with the socio-political changes of its present context.

Walking through Taipei today reveals a highly complex and intricate streetscape that has been formed organically through local adaptations. The flexible organizational framework of the modern streethouse allows for its occupants to self-fashion and participate in the design process of the type. Along the *ding-a-ka*, each storefront is customized by its owners with colourful advertisements, glass displays, outdoor furniture, and ceiling lights. Kitchen trolleys with stove tops and sinks are spread throughout the *ding-a-ka* of restaurants serving food to vehicles and pedestrians along the streets. The minimalist concrete facades are adapted with façade additions consisting of: shading devices, extended balconies, metal cages, and glazed enclosures. Together these facade structures house objects such as potted plants, storage boxes, air conditioning units and clothing that are publicly exhibited to the streets below. Rooftop additions are cladded in colourful corrugated metal to form cheap residential units and communal patio spaces. These additions reveal a myriad of approaches taken by the building occupants to personalize and improve the functionality of their homes.

Due to the rapid pace of modern streethouse developments during this period, the local government in Taipei faced difficulty reviewing and enforcing the building code. This was especially the case during 1949-1987, when the KMT party enforced martial law on the island. This period saw the "unchecked urban expansion" [20] of informal settlements and building adaptations that proliferated throughout Taipei. Taiwanese architect, Roan Ching-Yuan, describes the spontaneous nature of illegal architecture in Taipei as an "ad hoc urban phenomenon" that is a "home-grown yet highly adaptable model." Roan claims that locally produced interventions are capable of creating meaningful connections with the urban realm and the daily life of local citizens. The layers of adaptations that have formed on the modern streethouses create a coherent architectural language that reflects a dialogue developed between: local user needs, and the spatial possibilities provided by the type. They are expressions of self-representation that demonstrate methods that have incrementally transformed the streethouse to better suit local needs.

20 *Pitkänen, Ari-Joonas. "Wild Cities: The Renegade Roots of Urban Taiwan." Cross-Currents, no. 33, 2019: 242.*

Fig. 2.15 View into a busy day-time market formed between streethouses. Shoppers and market stalls naturally self-organize around this pedestrian-only urban corridor.

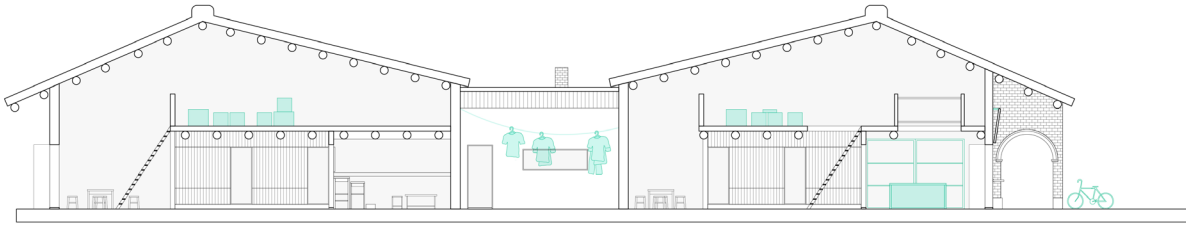


Fig. 2.16 Minnan-style streethouses feature interior mezzanines between the ground floor and roof that could be adapted for the storage of family or shop goods. Courtyards are outdoor spaces that provide ventilation and sunlight into the segments.

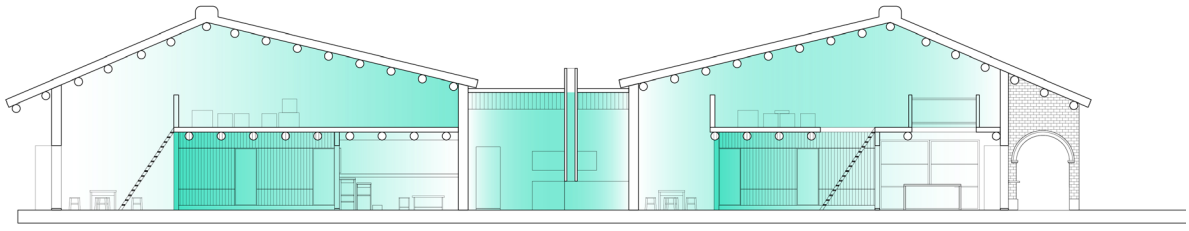
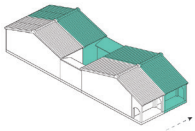


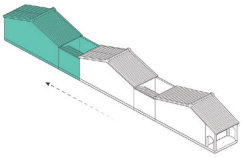
Fig. 2.17 Business and domestic activities regularly overlap within the shops of the Minnan-style streethouses, as household activities would occur directly behind the shop.

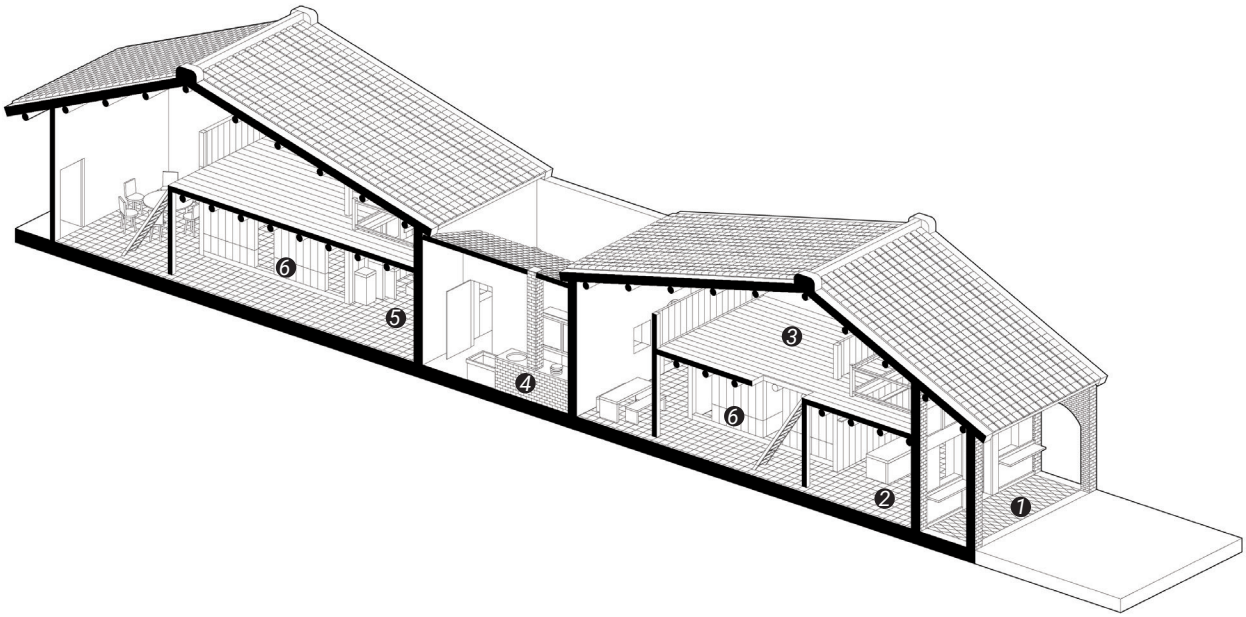
Minnan-style Streethouse

Qing Dynasty (1683)



The Minnan-style streethouse is organized by segments that could grow linearly or horizontally. The segments produced a variety of live and work configurations that could grow depending on the needs of the family or shop functions. In between the segments featured courtyards that could be used for kitchens or washrooms.





1 *ding-a-ka and storefront*
2 *family-owned shop*
3 *shop storage space*
4 *courtyard kitchen*
5 *family prayer shrine*
6 *bedroom*

Fig. 2.18 Significant spatial elements in the Minnan-style streethouse.

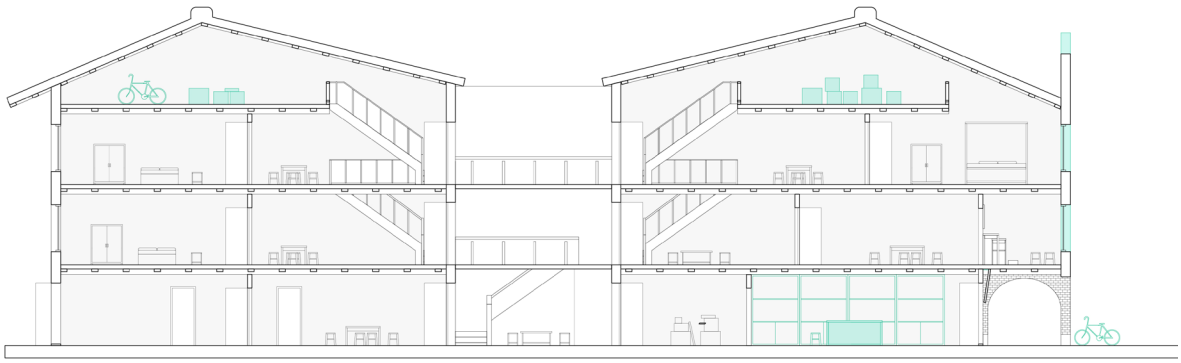


Fig. 2.19 Due to colonial influences, the Japanese-style streethouse facades were adapted with classical-style ornamentation. Like the Minnan-style streethouse, the interior living and work programs could also be fluidly re-arranged throughout its structure.

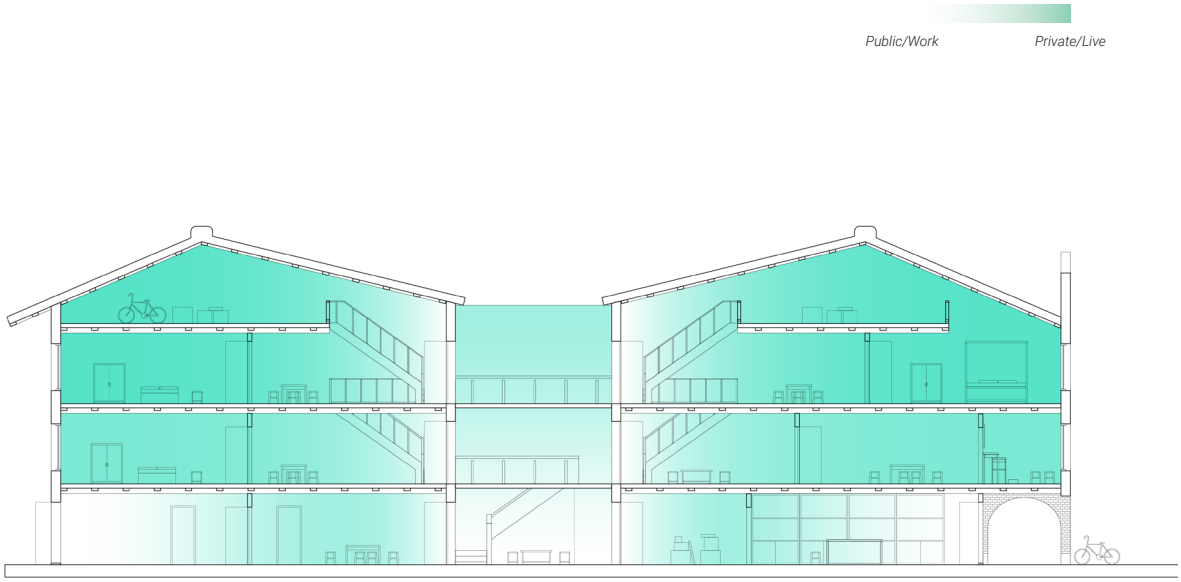
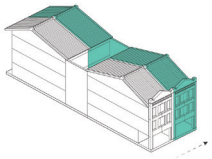


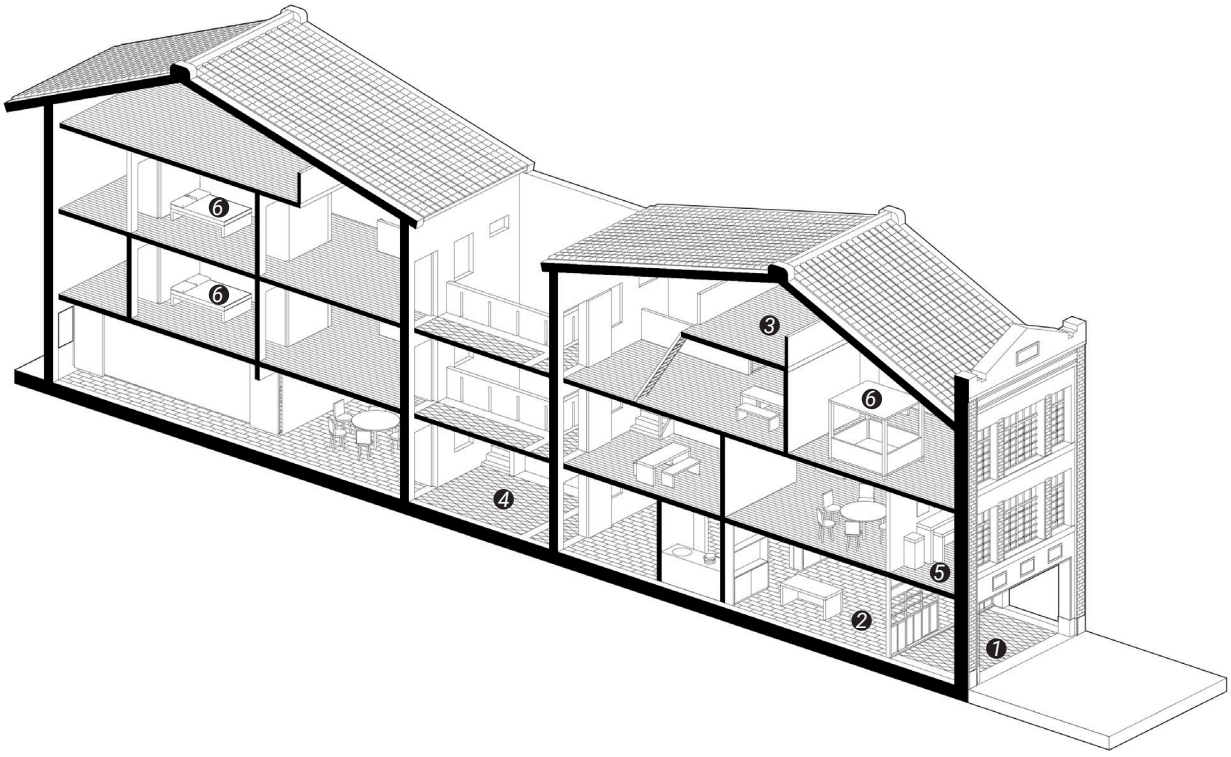
Fig. 2.20 Shop functions in the Japanese-style streethouse would often extend through the entire ground-level or the upper levels depending on it's spatial needs.

Japanese-style Streethouse



Imperial Japanese Empire (1895)

The Japanese-style streethouse retained the segmental organization, however was able to grow vertically to house industrial functions and larger shops. The courtyards were made free from kitchen or lavatory functions due to the advent of modern plumbing and utilities. The courtyard served as open-air circulation space that led to residential spaces on the upper levels.



1 *ding-a-ka and storefront*
2 *family-owned shop*
3 *storage space*
4 *open courtyard*
5 *family prayer shrine*
6 *bedroom*

Fig. 2.21 Significant spatial elements in the Japanese-style streethouse.

Fig. 2.22 Adaptations to the modern streethouse are most commonly seen on its facade and rooftop. Together these exterior additions create a recognizable pattern through its ubiquitous application in Taipei.

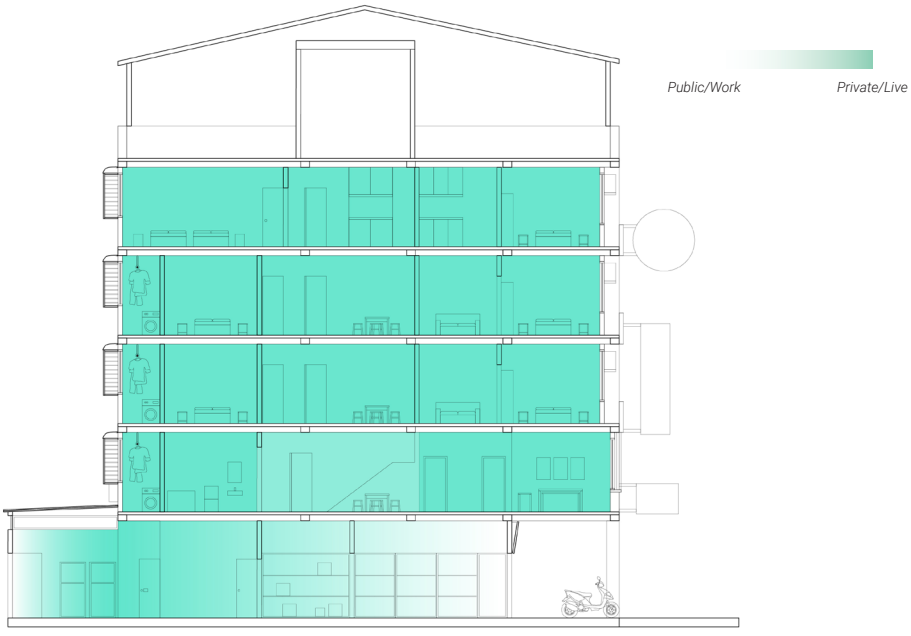
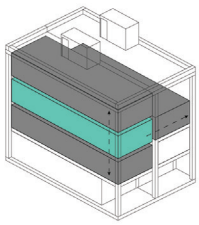


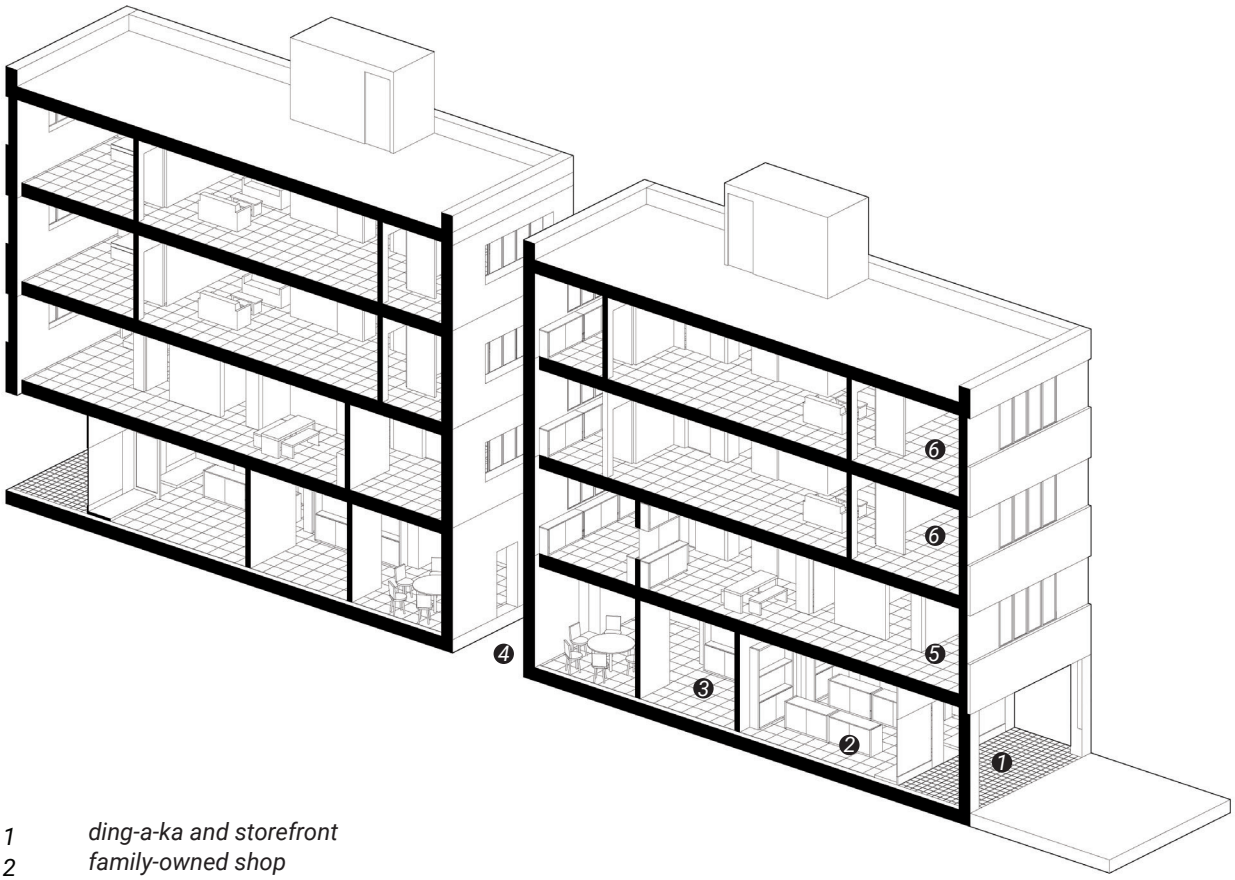
Fig. 2.23 The ground floor shops, restaurants and markets produce a dynamic street condition where work-live functions permeate from inside the shops and through the ding-a-ka.

Modern-style Streethouse

Chinese Nationalist Rule (1945)



The modern-style streethouse produced a highly adaptable organizational framework due to it's interior flexibility and concrete construction. The *ding-a-ka* and building width of the previous streethouse variants were maintained, however the structure grew to four to six storeys. Due to the rapid urban growth in Taipei, the streethouse was developed to house multiple families within its 'apartment' units on the upper levels.



1 *ding-a-ka and storefront*
2 *family-owned shop*
3 *shop storage space*
4 *courtyard kitchen*
5 *family prayer shrine*
6 *bedroom*

Fig. 2.24 Significant spatial elements in the Modern-style streethouse.

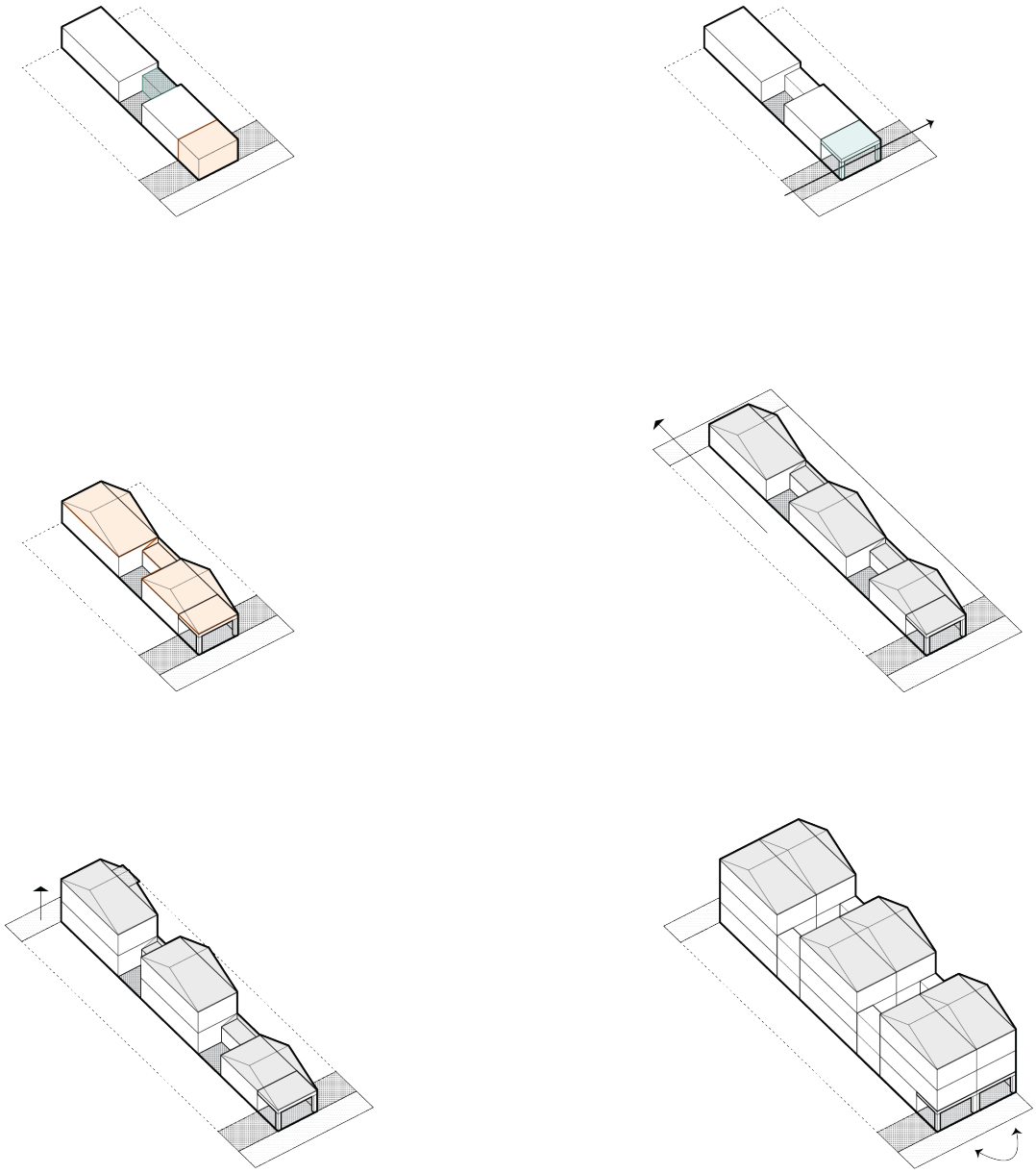


Fig. 2.25 The Minnan and Japanese-style streethouse types are reduced here into basic diagrammatic segments to study the operations and stages of their development.

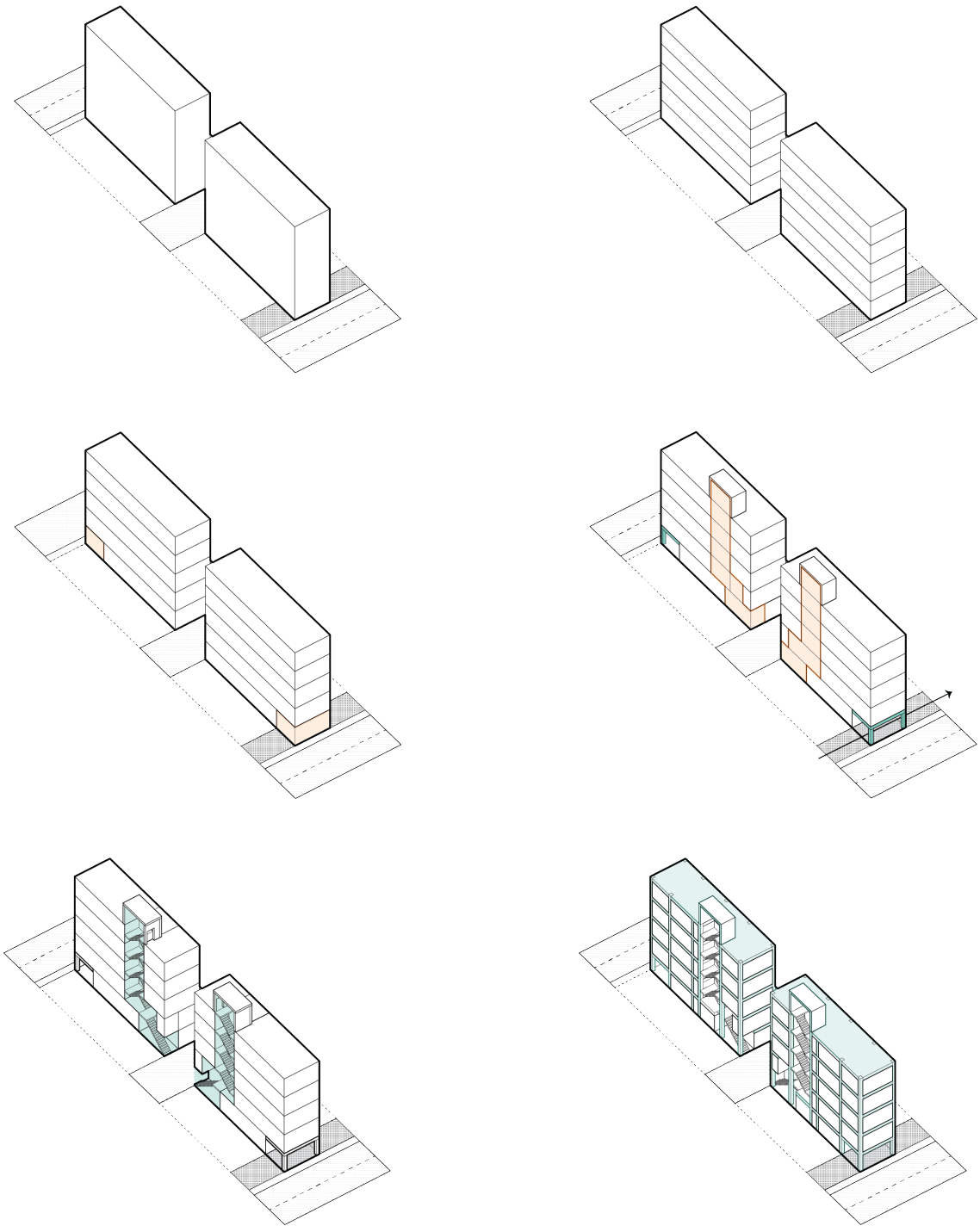


Fig. 2.26 The long and narrow form of the modern streethouse allowed it to fit within the urban fabric of the pre-existing streethouses variants. Its open-ended framework enabled households to adapt the interior spaces based on family and business needs.

2.4 The Socio-spatial Relationships:

It has been shown so far that the streethouse type has been developed in Dadaocheng through a continuous process between: its implementation, as a consequence of socio-political change, and localization, as a consequence of adaptations by local citizens. Each colonial period has led to architectural developments that can be mapped through the evolution of the streethouse type. However, what maintains consistent throughout its morphology are the formal structures that are linked to its type process: the *ding-a-ka*, the urban corridors that it assembles, and adaptable household live-work configurations. Each of these formal structures work together to support socio-spatial relationships and behaviours that have been forged through the urban development of Taipei.

The *ding-a-ka* is a spatial form that provides a covered urban corridor aligned parallel with the street. It is created through the setback of the ground floor commercial space and functions to shield urban pedestrians from direct sunlight or rain. In its basic form, the *ding-a-ka* is made up of exterior columns along the street, a soffit and a storefront façade that serves as the entrance into the streethouse. The *ding-a-ka* can be described as an urban zone where the public and private realms intersect. It is a public space for parking vehicles, such as bikes and mopeds, a space for displaying shop goods, and a source of urban circulation that extends through its city blocks. Each streethouse segment presents a new threshold, as every *ding-a-ka* is adapted by its owners through commercial activity, furnishing and decorations. Car repair shops are loud and open spaces, with mechanics working under elevated vehicles. Clothing boutiques are brightly-lit with products displayed on racks and carts that line the exterior of the shops. Restaurants have portable kitchens and trolleys that are placed at the front of the store, where the chefs cook and display their food. Local citizens interact within the *ding-a-ka* through browsing, waiting in line, sitting, and eating. When a series of streethouses are assembled, the *ding-a-ka* work in concert to support lively markets and social gatherings. In the event of night markets, the commercial realm expands beyond the *ding-a-ka* through the sidewalks, streets, and alleyways. The streets become pedestrian only zones, and shop trolleys are moved out on the streets to form an urban living room and kitchen. Local citizens self-organize around each brightly-lit night market stall to eat traditional foods, play carnival-style games and shop for local goods.

Fig. 2.28 A view into a family-run motorcycle repair shop that is used as both a work and family space. Household furniture and mechanical equipement demarcate the two zones from one another. Children are seen here playing in the shop, while their mother supervises the store functions.

Fig. 2.29 A very small-sized family-run restaurant occupies the entirety of this ding-a-ka segment. The kitchen is built into a small storage wall and the seating is aligned along the walls. The family members supervising the shops lounge within the ding-a-ka watching television.

Within the streethouse shop, the residential and commercial realms overlap due to the blending of domestic and work activities. This produces a dynamic ground floor environment where household members simultaneously take turns performing work tasks, and domestic chores. Directly behind the shop, family-run businesses will typically be adapted with a dining space, family room, and kitchen making it convenient for the households to manage both live and work functions together. Despite a separation in its layout, domestic activities often extend into the commercial spaces. Households gather in the shops to watch television and eat dinner together. Parents that are managing shop operations simultaneously supervise their children. Customers and neighbours visit the shops to gather and socialize. The shops, therefore, can be understood as a productive extension of the home enabled by the work-live flexibility of the streethouse. They serve as the linkage that joins the upper-level residential spaces to the ground floor commercial activities. Despite the stochastic street level environment caused by the inflation of shop and family functions on the ground level, its spontaneous occurrence allows for a lively urban environment and sustains the livelihoods and daily activities of the local population.

The urban fabric of Dadaocheng is a complex network of public-private and live-work realms that overlap to create fluidly shifting gradients of activity. Such activities are spatial practices and behaviours that challenge and re-shape the boundaries defined by type. They evolve and transform type through their generational recurrence that have sustained through the development of a city. Yoshiharu Tsukamoto describes types and behaviours as “material forms” that have been developed through the balance of various factors such as “climatic, material, lifestyle, institutional, or economic.”[21] This balance reflects the conditions of a particular locale and produces a shared understanding of how urban space functions. According to Yoshiharu, by retracing the material forms associated with building typologies and behaviours, it enables researchers and designers to learn how spatial relationships have been given form. Thus, providing crucial insight for designing future types that are appropriate for a specific community or cultural context.

21 *Tsukamoto, Yoshiharu. “Commonalities in Architecture.” Bracket 4: Takes Action (2020): 102-109.*

Fig. 2.30 A home-goods shopowner is shown here supervising the store from the ding-a-ka. Shop products are often displayed throughout the ding-a-ka blurring the boundaries of what is public and store space.

Fig. 2.31 A restaurant is shown here with its kitchen aligned along the street in a ding-a-ka. Customers sit inside the shop space while pedestrians can order take-out from the sidewalk.

2.5 Obsolescence of the Streethouse

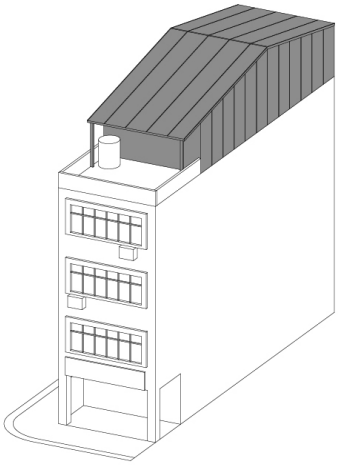
Visiting Datong District today reveals city blocks barricaded in blue tarp and metal fences. While hidden from plain sight, the sounds of streethouses being demolished reverberate throughout the surrounding neighbourhoods. Advertisements on the metal fences project renderings of the future which will replace the old. Modern obsolescence powered by political policies for urban renewal have begun to reshape and redefine what is valuable for the city. Family structures that were once distributed along five-metre-wide lots are now stacked vertically on a single blended lot. As the typology begins to diminish, here we examine the threats to and implications of its disappearance.

The majority of streethouses in Datong District are aging structures that currently face obsolescence due to their poor physical conditions and lack of modern amenities.[22] Modern-style streethouses built after the 1960s were poorly constructed and lacked proper maintenance. Common issues include: building deterioration, structural damage, fire safety and poor interior living environments. In addition to physical issues, the lack of accessibility for elders and people with disabilities have become a serious concern for the local government. Homes were not built with elevators until the late 1980s, therefore many disabled and elderly residents are unable to access their units. This issue has become increasingly pervasive as the proportion of elderly people continues to increase over time.[23]

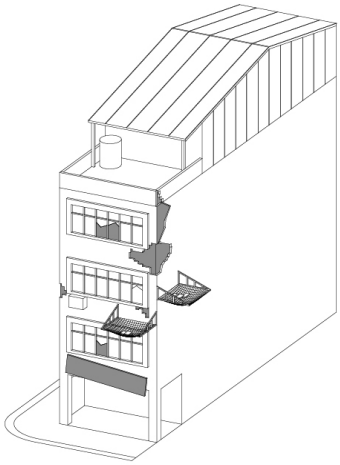
At the end of its life cycle, the streethouses will undergo one of the two possible scenarios: to be repaired and renovated or demolished for new construction. In reaction to the unsafe and poor living conditions of the older streethouses, the Taipei City Government has provided a series of subsidy packages to financially support the addition of elevators, repair of exterior walls and addition of structural reinforcement. Despite these subsidies, full building repairs and renovations are not a common practice due to negligent landlords and the high costs associated with repairs. To further complicate this process, in order for a full building renovation to take place, an agreement must be reached between the owners of each unit within a streethouse. Achieving a consensus between multiple

22 *Jr-Gang, ed. Heterogeneous Taipei: Post-60 Mid-low Rise Housing Renovation Makes the City. Garden City Publishers, 2013: 29-40.*

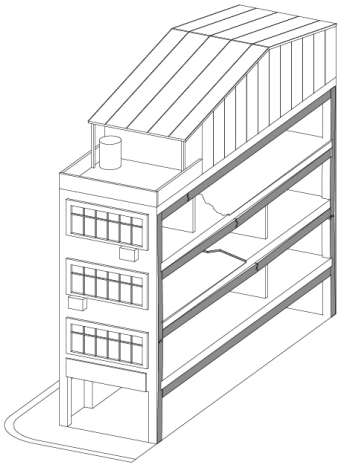
23 *Hsieh, Chun-Ling and Hetherington, William. "Bureau draws attention to elderly living alone". The Taipei Times. 2021.*



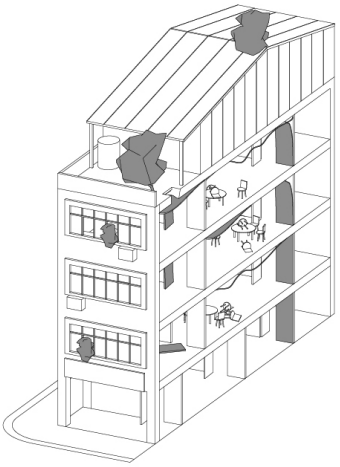
Fire Safety and Egress



Building Deterioration



Structural Damage



Poor Living Conditions

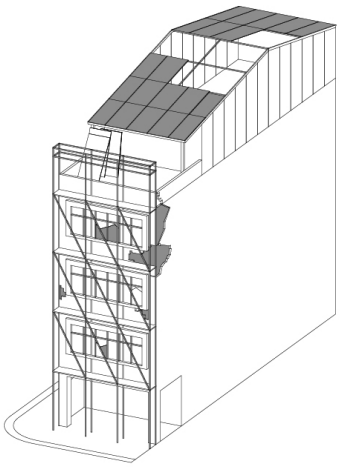
Fig. 2.32 Diagrammatic depictions of building issues designated by the Urban Rnewal Act of the Taiwan Government.

stakeholders has proven to be a laborious task. Where renovation projects are more commonly seen are in commercially viable areas where there is potential for greater financial returns. Landlords will invest in improving interior conditions of their units in order to attract residential and commercial tenants, while increasing their rental value. When repairs are not seen as economically viable, it is common for streethouses to be abandoned and left in a dilapidated state by landlords waiting to sell their land.

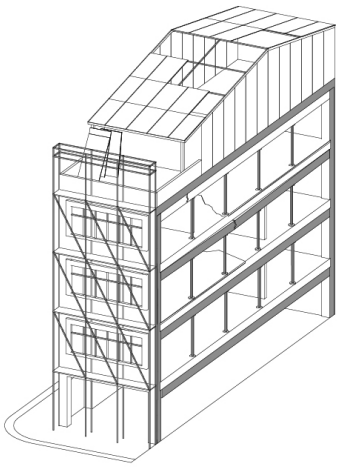
With a growing real estate market and rising demand for housing options,[24] the demolition of streethouses in Datong District has become a common method for landlords and developers to realize the economic potential of a given site. The modern streethouses were typically built to four or five storeys due to the seismic activity of the region and lack of elevators. However, with an improvement in building technology and new zoning incentives, developments have begun to grow taller and wider. Urban renewal policies have been instrumental in this process; the Taipei City Government currently provides floor-area-ratio (FAR) percentage rewards to new constructions on the site of buildings that are more than 30 years old. Additional percentage rewards are added on if the site can be expanded to consolidate with adjacent buildings. The scenario of demolition and reconstruction face similar challenges to the process of renovation. In order to consolidate multiple lots of streethouses, a buyer must purchase each individual unit from their respective owners, as well as each lot from its landlords. Despite these challenges, by leveraging the demand for housing and obsolescence of the existing housing stock, local developers and architects have shown that new construction can be highly profitable. In Datong District, redevelopment projects are widespread and have begun dramatically reshaping the urban fabric.

The modern typology that has been chosen to replace the streethouses can be described as multi-storey condominiums or gated communities. This new type represents a twentieth century western capitalist housing model, which prioritizes profit and maximizes density at the expense of social sustainability. They are foreign architectural products that are detached from the past urban fabric and limit the ability for mixed use programs. Dynamic neighbourhood spaces that once defined the urban realm have become internalized within its self-contained structure. The condominium type is designed for rapid reproduction and its type can be found throughout the globalized world, because it neutralizes local cultural and

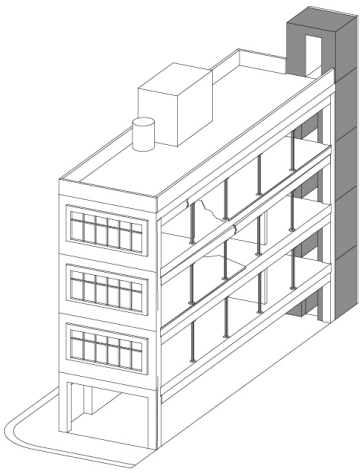
24 *Jr-Gang, ed. Heterogeneous Taipei, 2013: 29-40.*



Facade Facelift



Structural Reinforcements



Elevator Additions

Fig. 2.33 Diagrammatic depiction of repair strategies that are subsidized by the Taipei Urban Regeneration Office

site specificities. It differs from the modern streethouse because its development has no linkages to the typological processes in Datong District. Whereas the modern streethouse is an adaptable organizational framework and possesses formal structures evolved from the past, the multi-story condominium is made of a fixed framework where its programmatic boundaries are clearly defined. Access to residential programs is marked by security checkpoints and commercial spaces are exclusively located on the ground level. Living arrangements are designed according to capitalist specifications of an ideal nuclear family.[25] Inside its structure includes modern amenities, communal spaces, advanced building technology and parking spaces that reflect the changing needs of society but doing so from within its privatized boundaries. The buildings have become a symbol of luxury, and its homes are marketed as superior forms of living. The condominium type is a modern model that we can both critique and learn from. Its dominance and widespread adoption provide urgency for the creation of new alternative typologies and solutions that can better reconcile the existing context and economic pressures.

25 *Lathouri, Marina. "The city as a project: types, typical objects and typologies." 2011: 24-31.*

Fig. 2.36 An series of new high-rise condominium projects in Datong District.

Site Introduction: Dadaocheng, Datong District

As mentioned in Chapter 2 of the thesis, Dadaocheng is a historic neighbourhood in Datong District which was once the commercial centre of Taipei. It is described locally as the cultural 'heart' of the city, concentrated with streethouses that date back to the Qing Dynasty and Japanese Colonial eras. Along Dihua Street, the oldest street in Datong District, family-owned businesses continue to operate as they have for several generations, producing and distributing traditional goods such as medicinal herbs, dry foods, fabrics, and specialty tea. New local businesses such as boutiques, cafés, art studios, and galleries have begun to flourish within the historically preserved streethouses, drawing tourists and young people to the area.

Each streethouse on Dihua Street is unique in its segmental organization, materiality and façade design depending on the historical period and household preferences that consolidated its form. Within the 800-metre stretch of Dihua Street, the majority of the preserved streethouses date back to the Japanese colonial period and can be observed by their ornamental baroque and neo-classical façade features. Between the stretches of Japanese-style streethouses are nested restored Minnan-style streethouses that are uniquely constructed with red-brick and wood. The streethouses on Dihua Street have remained as flexible structures that can be re-configured for contemporary live and work configurations. Despite the unique differences between each streethouse, they are together unified by *ding-a-ka* corridors that connect the historic neighbourhood to the rest of Datong District.

Annually, in the weeks leading up to the Lunar New Year, Dihua Street transforms into a vibrant market, where families will purchase holiday necessities such as ingredients for traditional meals, decorations, gifts, and prayer supplies. During this period, the streets are adorned with lanterns and colourful banners, while shop owners occupy the *ding-a-kas* with speakerphones and free food samples in attempt to attract the waves of visitors into their shops. This lively atmosphere serves as a reminder for local residents of how Dadaocheng once functioned regularly before the Taiwan government developed the East District (Xinyi and Daan) into the modern commercial and financial centre of Taipei in the 1980s.

Along Guisui Street, as one travels west of Dihua Street, Dadaocheng Park serves as the visual boundary between the historically preserved colonial streethouses and the modern streethouses that were built after the 1960s. On Yanping North Road, the modern streethouses and various multi-story apartment types

❶ *Dihua Street*
❷ *Ningxia Nightmarket*
❸ *Dadaocheng Ciseng Temple Food Market*
❹ *Dadaocheng Wharf*
❺ *Project Site*

Fig. 3.38 Map of Datong District highlighting the project site and the significant cultural spaces in the region that have been photographed and documented in this thesis.

represent the most common housing options currently available to Taipei residents. They are aging buildings that are subject to urban renewal incentives and rewards. Immediately south of Guisui Street and Dadaocheng Park are the location of two redevelopment projects that showcase how the urban fabric in Datong District is currently being renewed.

Currently, two developer-led residential condominiums are being constructed along Guisui Street on the intersections of Minle Street and Section 2, Yanping North Road. Both projects have dramatically transformed the neighbourhood through the mass demolition of streethouses and the local family businesses that thrived within its shops. The project on Minle Street is built on the site of 10 streethouses and its 15-storey structure is marketed to accommodate 104 households and 7 commercial shops on its ground floor. The project on Section 2, Yanping North Road, is a 12-storey structure proposed to accommodate 29 households and 7 commercial shops on its ground level.

The site of this thesis design proposal is an urban block that is located at the northwest corner of Guisui Street and Section 2 of Yanping North Road. This urban block, made up of 13 modern streethouses, serves as a junction between the historical neighbourhoods of Dadaocheng and its rapidly transforming urban periphery. This site provides a unique opportunity for testing design strategies that respond to: 1) The historical development of the streethouse type and the spatial practices that it sustains, and 2) the present demands for densification and improved building amenities.

Fig. 3.40 The demolition site at the intersection of Guisui Street and Section 2, Yanping North Road.

Fig. 3.41 The demolition site at the intersection of Guisui Street and Minle Street.

1) Dihua Street

Fig. 3.42 A view of a family-run breakfast shop on Dihua Street, where the children assist their parents with preparing the shop before their school-day begins.

Fig. 3.43 A dried-foods shop owner taking a morning break outside on Dihua Street to read the morning newspaper.

Fig. 3.44 View into a family-owned whole-sale shop that has created multiple levels of shelves for storage.

Fig. 3.45 A japanese-style streethouse that sells locally made straw-baskets and bags on Dihua Street.

1) Dihua Street

Fig. 3.46 A family-run wholesale dried goods shop on Dihua Street, where the owner is packaging products to be sold and shipped.

Fig. 3.47 A series of restaurant stalls with customers seated and eating along Dihua Street.

Fig. 3.48 View down Dihua Street showing the many store signs, parked vehicles, and hanging light fixtures that decorate the streetscape.

Fig. 3.49 Restaurant stall owner preparing ingredients along Dihua Street in the early morning. Makeshift materials such as cardboard boxes and an umbrella are used here as outdoor furniture.

2) Ningixa Nightmarket

Fig. 3.50 View of the portable kitchens and night market chefs at work preparing food for visitors. Every afternoon before nightfall, each food stall arrives at the designated position that they occupy on Ningxia Road.

Fig. 3.51 Kitchen trolleys are independent movable structures that plug into gas tanks and use water from outdoor faucets that have been built into the sidewalks.

Fig. 3.52 Evening view from the sidewalk of Ningxia Road which is transformed into an outdoor dining space by street vendors.

Fig. 3.53 View from a line-up that has formed behind a food stall at Ningxia Nightmarket. The cooking and preparation process provides spectacles for visitors as they decide and wait their turn to order.

3) Dadaocheng Cisheng Temple Food Market

Fig. 3.54 View inside the permanent food stalls that have been constructed outside the Dadaocheng Cisheng Temple.

Fig. 3.55 The Dadaocheng Cicheng Temple is located directly adjacent to two elementary schools making it a popular destination for young students to buy snacks.

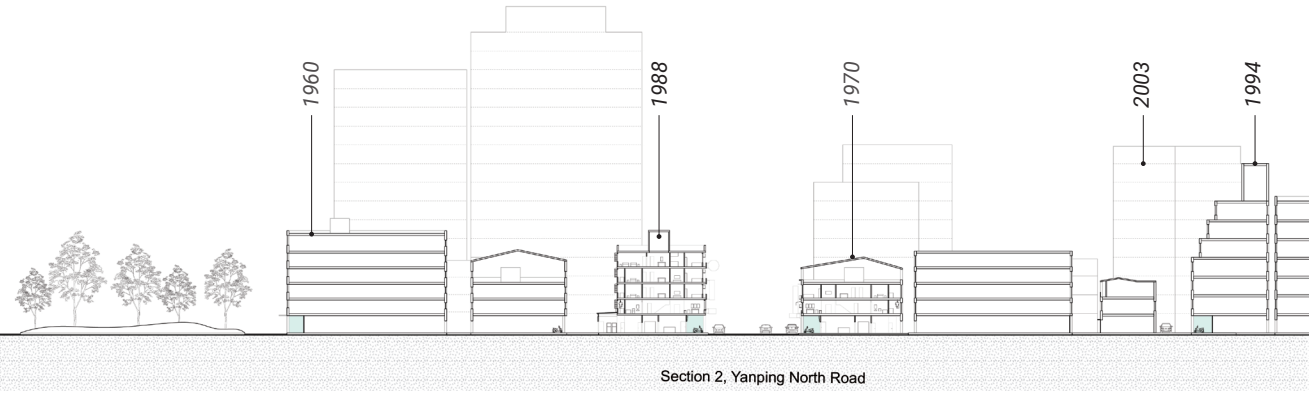
4)Dadaocheng Wharf, Tamsui River

Fig. 3.56 View from the top of food stalls that have been constructed at the Dadaocheng Pier Plaza along the riverside. Tamsui River is a popular location due to its parks, sports facilities, bike paths and outdoor kareoke spaces.

Fig. 3.57 The food stalls are made of pre-fabricated shipping containers allowing visitors to sit on its rooftop and gather along the pier.

Fig. 3.58 Site context and section highlighting the continuous urban corridor formed collectively by the ding-a-ka's of the streethouses.


Bao'an Street
Section 2, Yanping North Road
Guisui Street
Minle Street
Guisui
Opera Park


1960
1988
1970
2003
1994
Section 2, Yanping North Road

5) Project Site

Fig. 3.59 Image of the project site, taken in 1969, showing firefighters extinguishing a fire at the local cinema. In the foreground are Japanese-style streethouses that once existed on the site.

Fig. 3.60 Image of the project site in 2022, showing the variety of streethouses that have been constructed after the 1960s. The local cinema has been replaced with a multi-storey office tower.

5) Project Site

Fig. 3.61 Used jewelry stores located on the ground level of the project site. Unit 188 on Section 2, Yanping North Road has partitioned its commercial space into two shops.

Fig. 3.62 Two of the shops on the project site occupy multiple levels of the streethouse. The landlord of the "COSMED" pharmacy shop has removed the concrete stair core from its original location and moved it to the back of the building in order to expand the commercial space.

Fig. 3.63 The streethouses on the project site house a variety of different shop programs. Shown here are a clothing boutique and walk-in medical clinic that has been on the site for over thirty years.

Fig. 3.64 The heights of the streethouses on the project site vary from two to five storeys. The two shops shown here are three-storey structures that have their facades completely covered by advertisements and air conditioning units.

Design Part I: Repair and Renovation

This following section will examine the repair and renovation of an existing streethouse at 190, Section 2, Yanping North Road. This section will first analyze how the streethouse has transformed spatially and programmatically as a multi-generational home from when it was first constructed. It will detail through analytical drawings the adaptations made by the streethouse occupants to better serve their household needs and the present challenges that contribute to the obsolescence of the home. The analysis of the streethouse will be followed by two design proposals that provide renovation strategies and solutions that will further develop the type by providing new spatial opportunities and improvements in accessibility. The design strategies can be seen as small-scale interventions that could be applied in phases or independently, depending on the needs of a given streethouse.

The modern streethouse located at 190, Section 2, Yanping North Road is a multi-generational family home that was built in 1988 to replace a dilapidated Japanese streethouse that suffered from water leakage and structural issues. It was constructed along with four other adjoining streethouses on the north end of the block and designed by the local architecture office, I.T. Wu & Associates.

From 1988 to 2005, the streethouse was regularly adapted to accommodate for changing demographic and economic changes, which saw three generations of a single family grow in size to occupy all five levels. In the initial family arrangement, four children lived on the fourth and fifth levels, while the parents lived on the third level and the paternal grandmother lived alone on the second level. The mother and father managed the retail store on the ground level which sold clothing and apparel imported from Japan, while the children would take turns assisting with both store and domestic activities after school. Beyond the ground floor shop, a family room, dining space and kitchen were constructed as much of the daily family activities were focused on the shop. Each upper unit functioned as individual dwellings that were connected by a single staircase providing privacy and separation from one another.

By 1999, the family arrangement expanded as two of the children were married and the maternal grandfather moved into the streethouse. In order to accommodate for the growing family, the fifth and second level units expanded their interior space into the neighbouring modern streethouse through the removal of non-structural walls. Due to aging and challenges with accessing stairs, the paternal grandmother would move into the family room on the

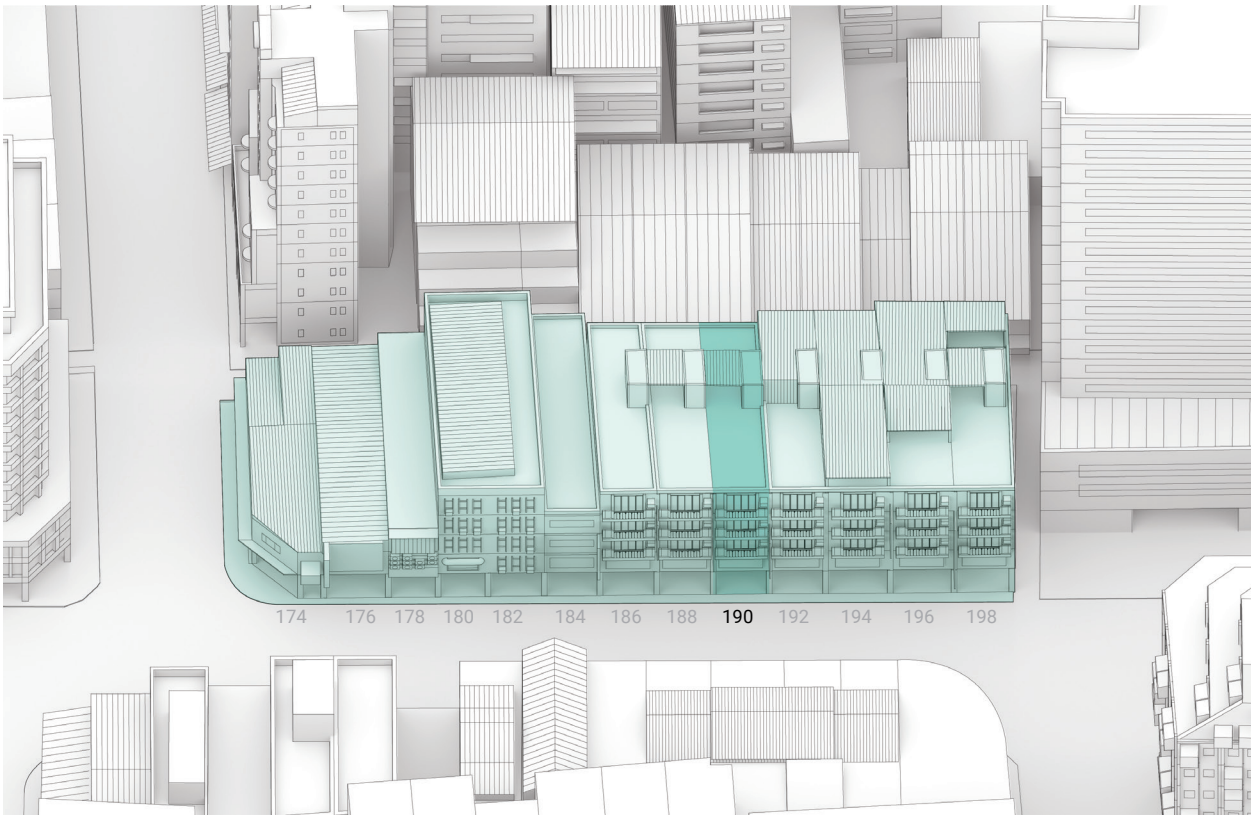


Fig. 4.65 The project site is at the intersection of Section 2, Yanping North Road, and Guisui Street. Streethouse No. 190, which is highlighted here will be used as a case study in the following sections.

ground level directly behind the family shop. In 2005, after the passing of the father and paternal grandmother, the family shop shut down and rented out its space to a local shoe company. Two of the children would move out with their own families and into a neighbouring high-rise apartment building two blocks away. The ground floor of the streethouse would be separated into two parts, the commercial shop facing Yanping North Road and an entry room which provided direct access to the residential staircase from the laneway. The mother moved into the second level to take care of her father, while the remaining two children lived on the third and fourth levels. The principal family room, dining room and kitchen was changed to the second level, where the remaining family would gather together.

4.1 Considerations and Design for Repair and Renovation

Presently in 2023, the modern streethouse at 190, Section 2, Yanping North Road requires repairs and renovations to better suit the changing family needs. After the passing of the maternal grandfather in 2015, only the mother and two of her unmarried children remained. The three family members together occupy three of the upper residential units, leaving the fifth level vacant. This scenario reflects the existing demographic challenges facing Taipei today, where a large proportion of adults live with their parents due to the rising cost of living and housing prices. Adults typically do not leave their homes until they are married and able to secure a dual income. When young adults do move out, the living options are limited to costly and constrained one or two bedroom arrangements.

As the family size has shrunk and the streethouse begins to face challenges with deterioration, we highlight here considerations for its repair and renovation. The major issues that have been identified by the family are: 1) the lack of accessibility for its elderly occupants, as the stairs are the only mode of vertical circulation through the streethouse, 2) water leakages that occur through its roof and façade, and 3) lack of natural sunlight and ventilation due to the blockage caused by the laundry room and additions that have accumulated on the façade. Additionally, the family has expressed an interest in expanding the ground floor commercial space through to the second level and making use of the rooftop as a covered terrace.

While exploring methods of creating new spatial opportunities and strategies of repair that are supported by Taipei government incentives, this project will explore the design of four features:

1. A double-façade system add-on that will serve as a rain screen

Fig. 4.66 Streethouse No. 186-198 all share similar design features as they have been built by the same architecture firm. White and grey ceramic tiles have been applied to their concrete structures, while some streethouses have added air conditioning units, facade and rooftop additions over time.

and allow for greater natural sunlight ventilation. This facade system applied on the street facing end of the streethouse will enable greater natural light by replacing the existing windows with a larger glazed surface. The degree of visibility through the windows can be controlled by curtains and a series of panels that offer different levels of opacity.

2. An elevator add-on and entry balcony on each level to allow for greater streethouse accessibility and to create a new outdoor entry for the residents. The elevator which is accessible from the laneway on the west end of the streethouse will provide the residents direct access to their respective unit level. The entry balcony will replace the existing laundry room with a private outdoor space for seating, gardening and hanging clothing to dry.

3. A communal rooftop terrace that provides a covered space for outdoor activities, while solving issues of leakage and water damage on the existing rooftop. In addition to repairing the water leakage from the roof, roof pavers and a low-cost corrugated steel panel canopy will transform the roof into an occupiable terrace that is accessible through the elevator.

4. Expanding commercial activity into the upper and adjacent units. Due to the shrinking family size, expanding the ground floor shop into the second level or adjacent streethouse provides economic opportunity for the existing homeowners by increasing the commercial space.

The design features proposed for the modern streethouse can be seen as adaptations that will produce greater functionality, while satisfying modern needs. The design will be speculated and applied to four adjoining modern streethouses, on the lots 189-193 of Section 2, Yanping North Road. Doing so allows us to envision how the design strategy can be applied as a collective urban form if the streethouse unit owners and landlords are able to cooperate and finance the project together.

This repair and renovation design approach engages with the streethouse typologically by exploring how its formal structures can be modified to resist obsolescence. By working incrementally to further adapt the streethouse based on present needs for comfort and accessibility, it allows the lifespan of the streethouse to be potentially extended. Each design feature presented above can be applied in phases or function as separate individual interventions depending on the needs and financial capacity of the building's occupants.

Fig. 4.67 View into the laneway on the west end of the project site. This image shows the residential entrances into the streethouses, which are constructed with illegal extensions that expand the ground floor area.

Fig. 4.68 View into the shop of a streethouse that opens into the laneway on the west end of the project site. This space is used as a storage facility for another nearby streethouse shop.

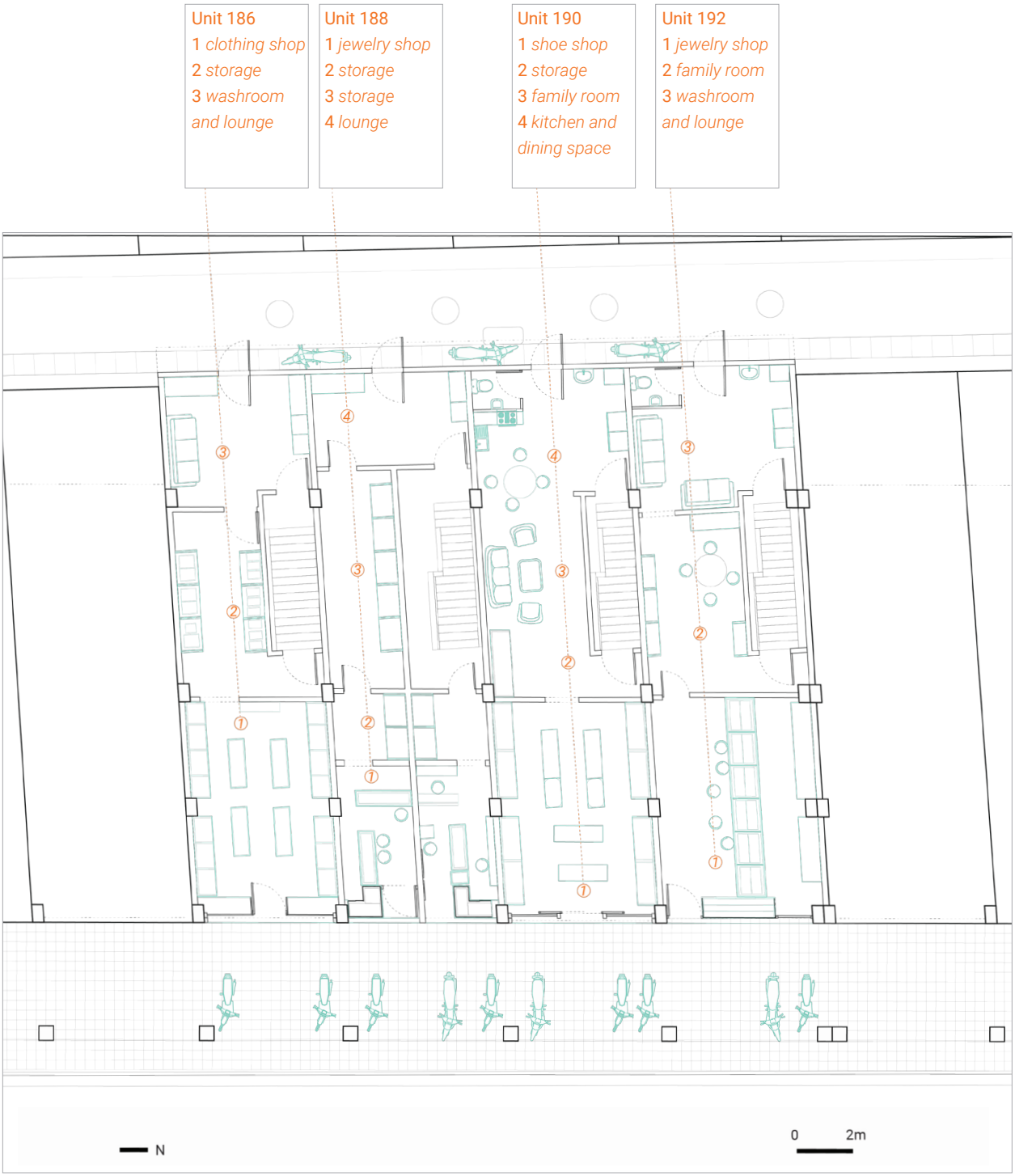
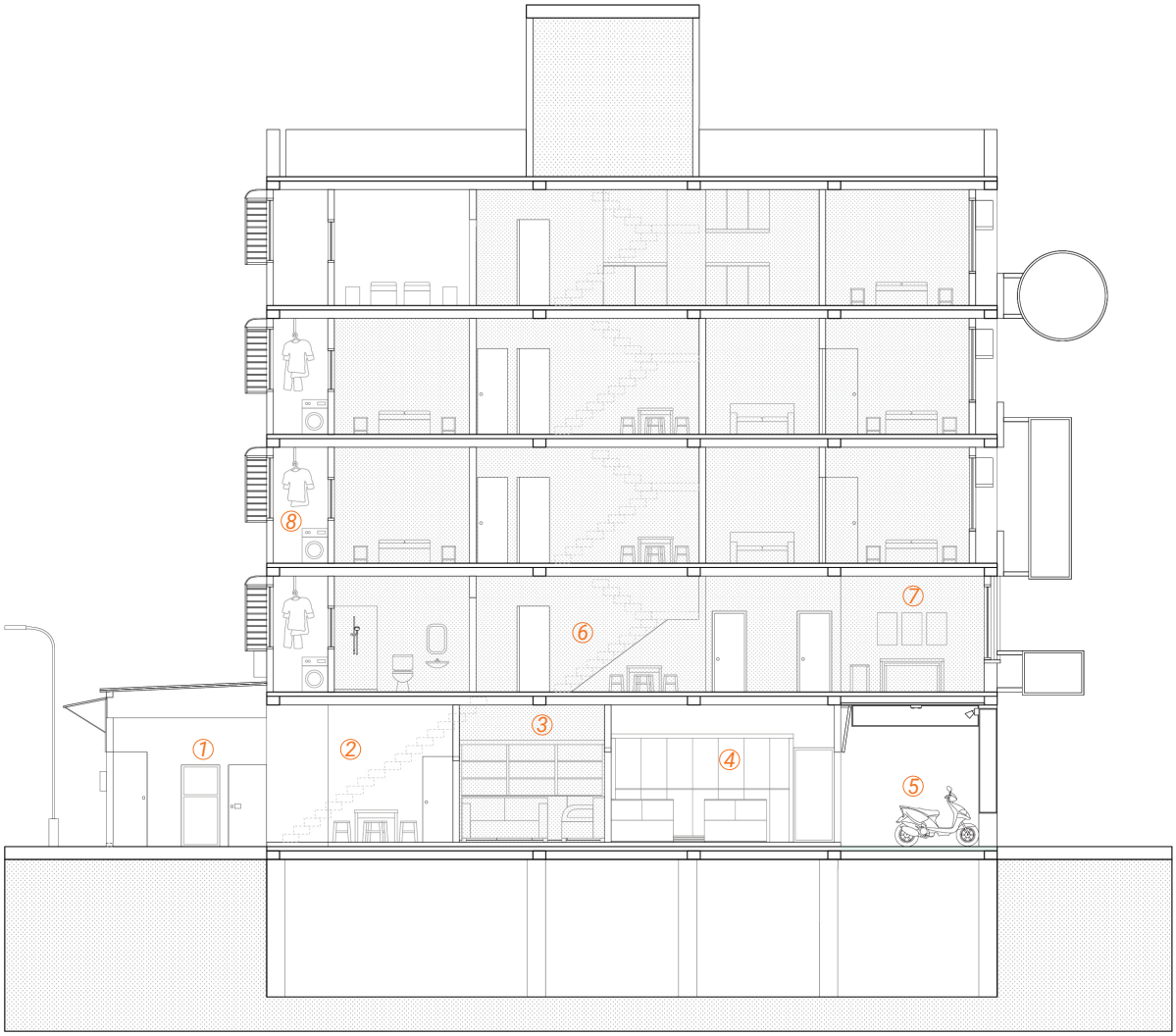


Fig. 4.69 Ground floor plan of four streethouses depicting how the live and work spaces are divided and able to co-exist.

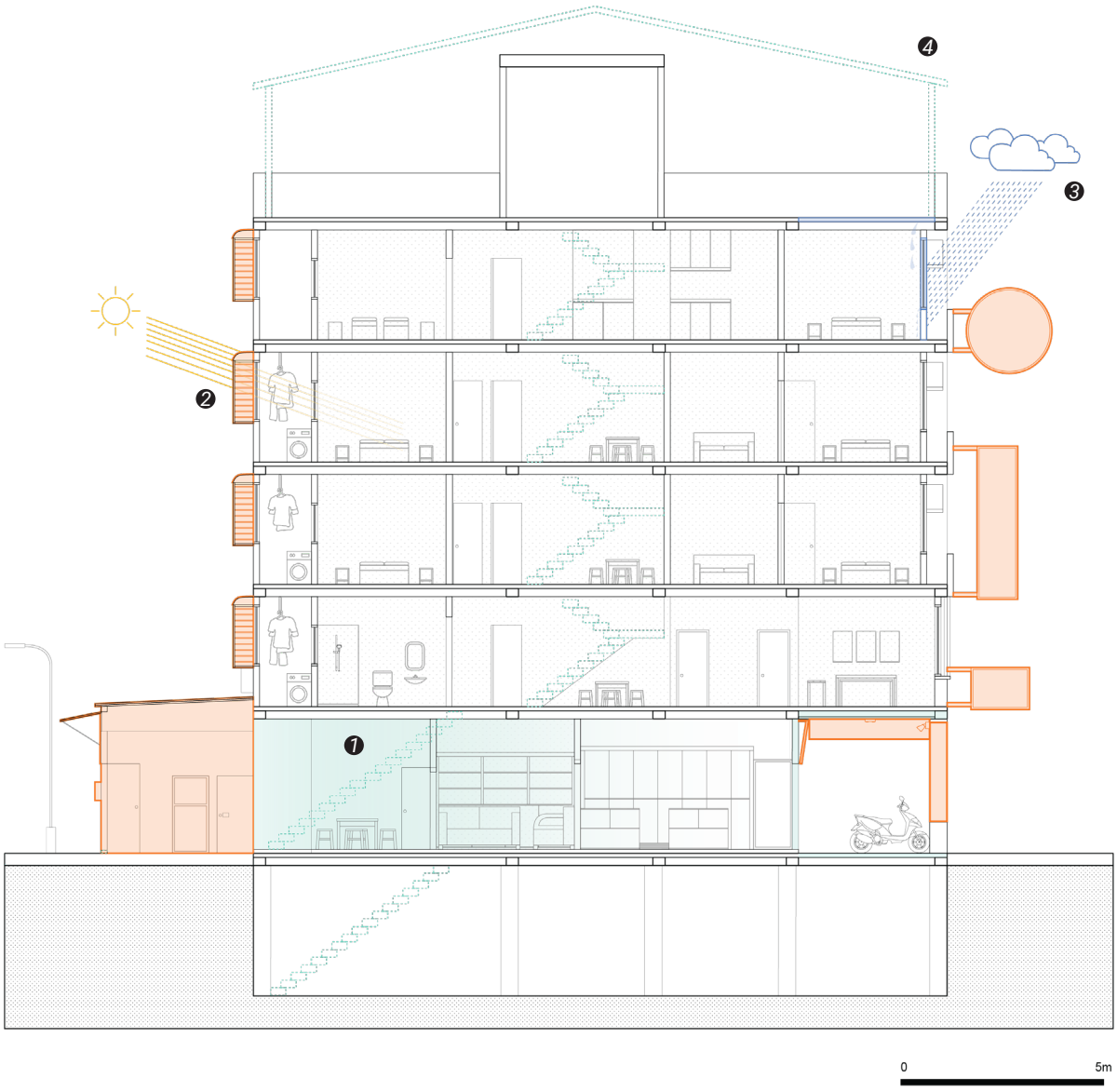
① main entrance
② bar and storage
③ master bedroom
④ family room
⑤ office and library
⑥ kitchen
⑦ childrens room
⑧ laundry room
⑨ childrens bedroom
⑩ prayer shrine

Fig. 4.70 The fifth level of the streethouse showing how two units are combined through the removal of a partition wall.



① *entrance vestibule and storage space*
② *ground floor kitchen and dining room*
③ *family room and shop storage*
④ *family-run shop*
⑤ *ding-a-ka*
⑥ *family dining room*
⑦ *family prayer shrine*
⑧ *laundry room*

Fig. 4.71 Building cross-section highlighting the family arrangement in the streethouse from 1999-2005, when four generations of a single family lived on the upper levels.



❶ *Accessibility barrier caused by stairs, presenting challenges for elderly and disabled occupants*

❷ *Lack of access to sunlight caused by the small laundry room and facade additions*

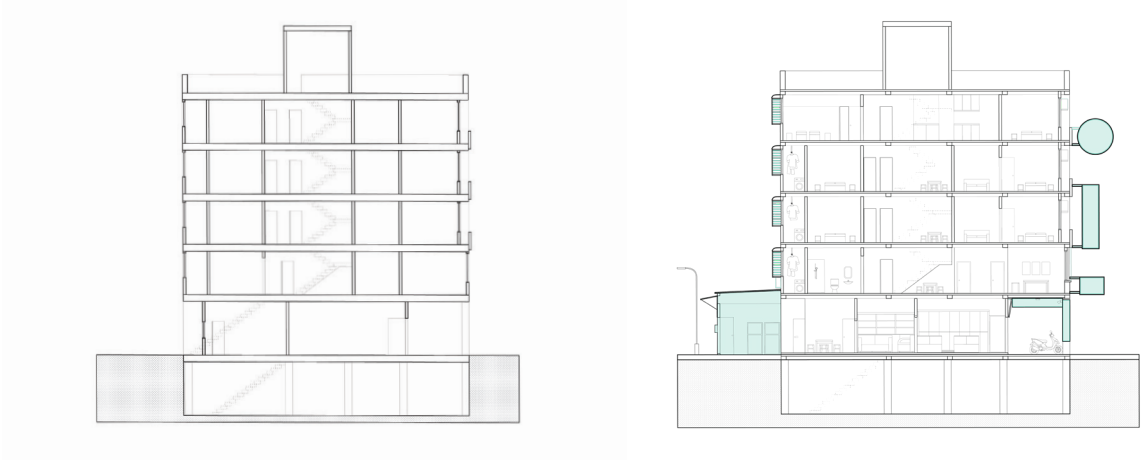
❸ *Water leakage through the facade and ceiling due to damage in concrete structure and window units*

❹ *Opportunity for outdoor activities, a garden and terrace space if rooftop can be covered*

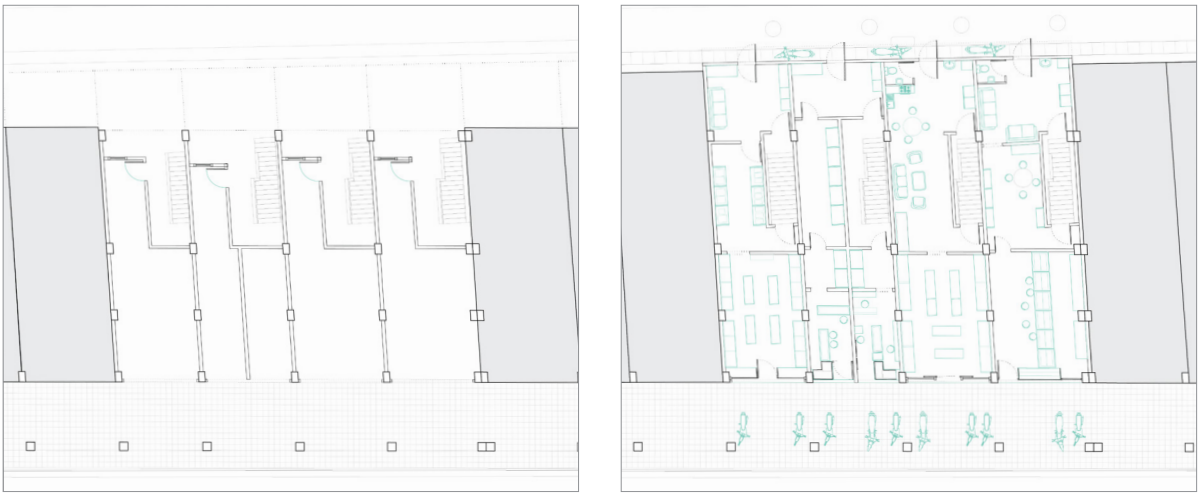
Fig. 4.72 Cross-section through the modern streethouse highlighting the major issues and opportunities that have been indentified by the family.

as drawn *exising condition*

section



level 1



level 5

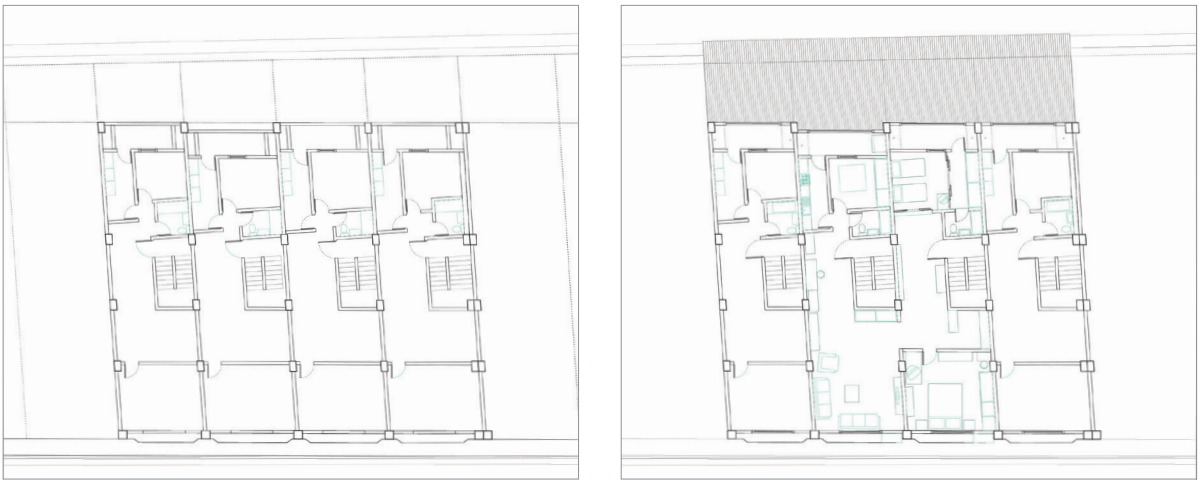
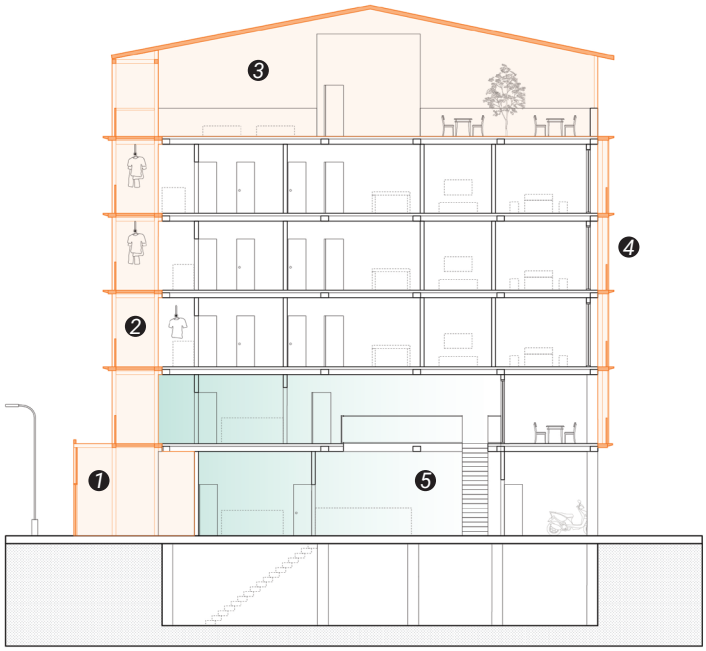


Fig. 4.74 Comparison of the streethouse as drawn by the architects to its current state after it has been localized.

Fig. 4.75 Two renovation strategies to improve the functionality and accessibility of the streethouse.

Renovation Option 1

The first design option investigates the scenario of adding elevators to each streethouse, while providing a private balcony entrance to each level from the western façade. This option enables greater privacy for the building occupants and only minor alterations to its internal layout.



❶ *An alleyway entrance vestibule for private residents to access the elevator*

❷ *An outdoor balcony entrance on each level connected to the elevator*

❸ *A covered rooftop terrace for communal activities*

❹ *A double facade system that serves as a rainscreen and provides privacy through movable panels*

❺ *Expanded commercial space and outdoor patio on the second level*

Fig. 4.76 Cross-section through the streethouse showing the design interventions for the first renovation option.

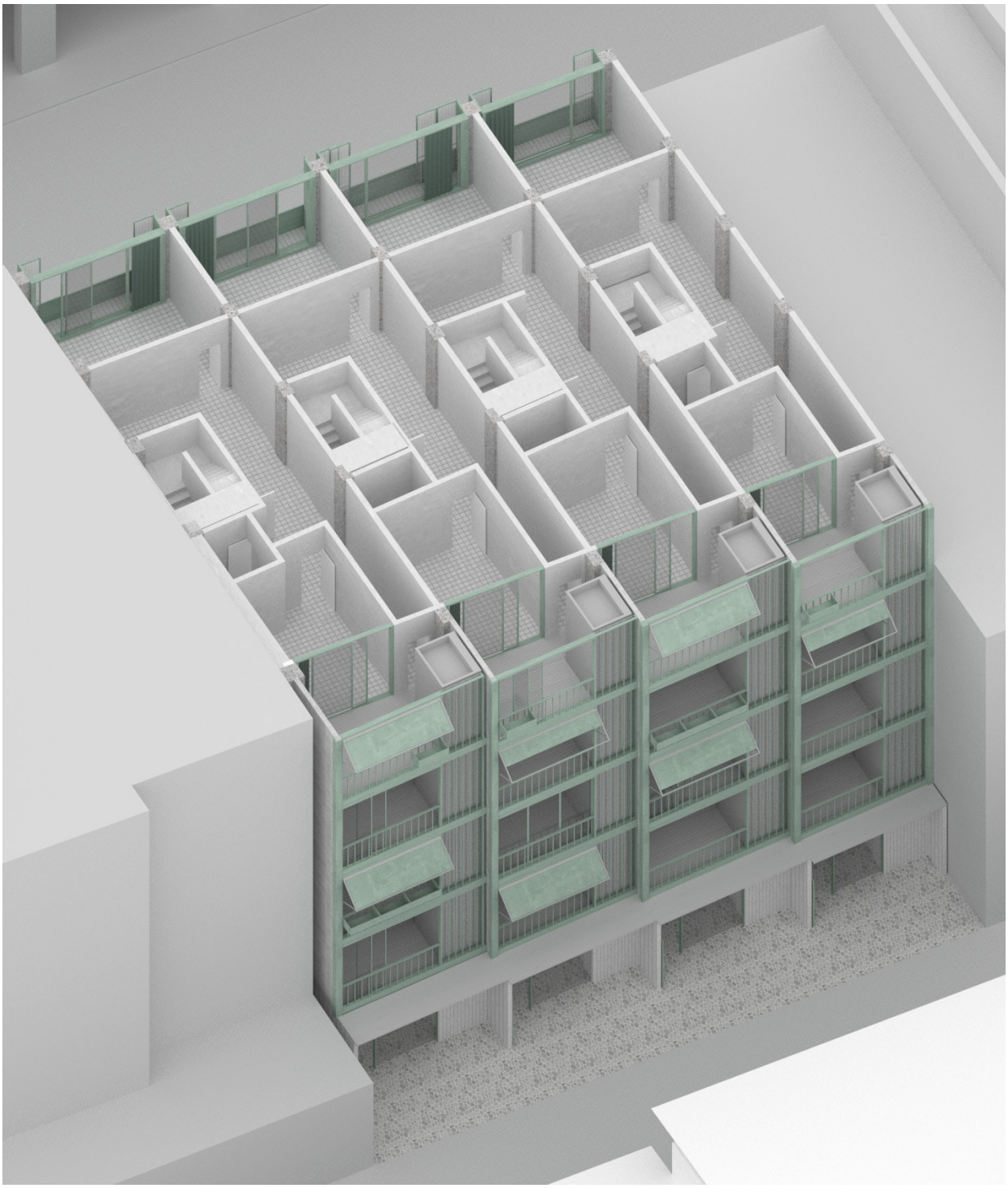
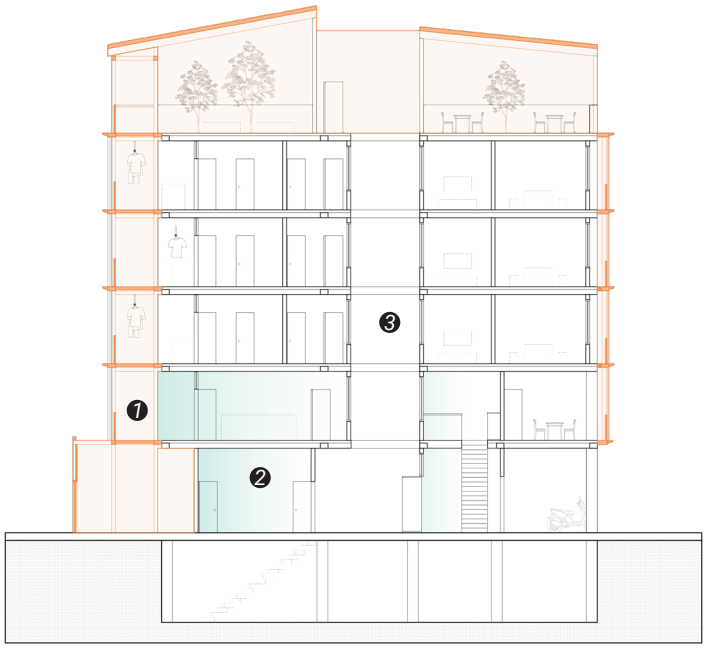


Fig. 4.77 The first renovation option uses a lightweight steel frame to create a facade system that is attached to the concrete structure. The balcony entrances provide additional outdoor space for the residents to personalize with shading devices, glazed enclosures, plants, and furniture.

Renovation Option 2

The second design option, which is developed from the first, imagines the scenario of joining two streethouses together to create greater interior flexibility and an internal courtyard through one of the staircases. This option reduces the number of elevators by creating a single elevator and entrance balcony that can be shared between two streethouses. Additionally, the commercial and residential spaces will benefit from being able to easily expand into their neighbouring unit to accommodate larger commercial stores and family arrangements.



❶ *A balcony entrance on each level shared by two units*

❷ *Expanded ground floor commercial space into the adjacent unit*

❸ *An atrium created through the removal of a staircore*

Fig. 4.79 Cross-section through the streethouse showing the design interventions of the second renovation option.

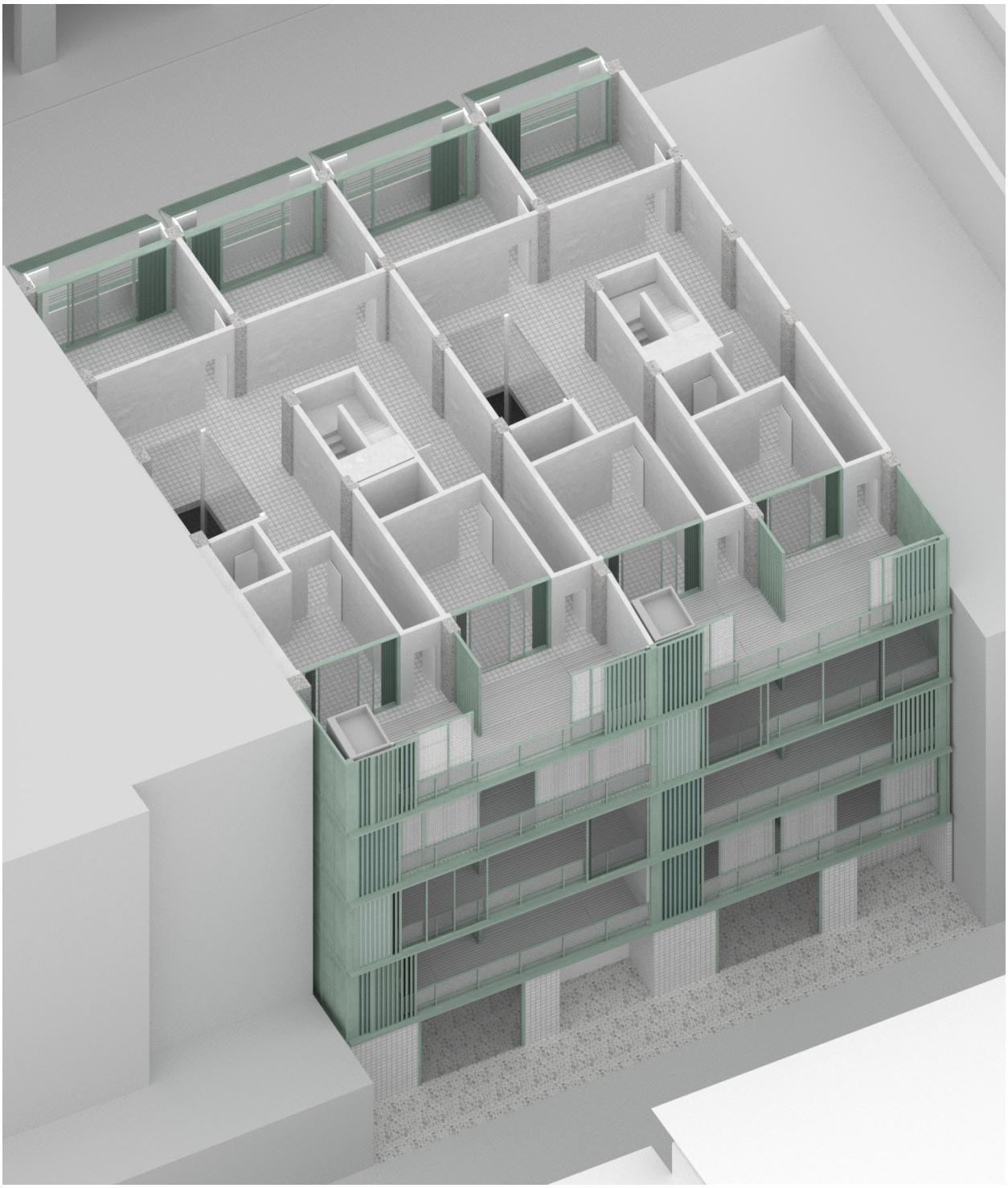


Fig. 4.80 Residents of this renovated streethouse enter from the ground level into a shared common space where they can access the private elevators to their units. The second renovation option uses a facade system that can be customized with panels to create different degrees of privacy and opacity. Units are shown here with perforated metal, louvered, and glazed panels that can slide on a single track.

Design Part II: Generating a New Type

In response to the present pressure for urban densification and need for alternative housing solutions, this following section will present through an iterative process the generation of a new residential type to replace the modern streethouses on the project site. The proposed type is a collective housing system that can actively evolve with society through its flexible framework. By permitting user participation in designing and transforming their homes, residents have the freedom to arrive at their own spatial interpretations to satisfy their present and future needs. This open-ended system utilizes John Habraken's concept of a "support-structure", to create a "framework for living" that joins together independent dwellings that can be adapted by its occupants through "infill."[1] The support-structure serves as a permanent object connected to the public domain, whereas the infill represents the changeable qualities that belong to the occupant. Through this approach, residents are able to collectively self-express and transform their homes through their everyday activities.

In designing a supports-structure for urban living in Taipei, the organizational frameworks of three emergent housing models from the 1960s will be analyzed to study the strategies used by local architects to expand the public realm through its architecture and the spatial experiences that have been produced as a result. The three projects were built in the 1960s to address the growing need for housing and were designed to support the growth of small businesses during Taipei's rapid modernization. Similar to the modern streethouse, the three types were constructed with reinforced concrete slabs and columns which allowed households to actively infill the structure with their activities and adaptations. Each project can be studied as iterative variations of the modern streethouse type that typologically reconfigures the ding-a-ka and live-work spaces to produce unique gradients of programmatic and spatial experiences.

The courtyard unit type is regenerated here to serve as the basic dwelling element that is assembled within the support-structure. The courtyard type provides a modular system for growing live or work segments depending on economic or household needs. As shown in the Minnan and Japanese-style streethouses, segments can be stacked vertically, added on horizontally and further adapted to function as commercial or residential programs. The courtyard unit can be assembled to support different scales of businesses and

1 *Habraken, N. J. Supports: An Alternative to Mass Housing The Architectural Press, London, 1972: 59-93.*

Fig. 5.82 Due to the density of commercial activity on Yongkang Street, the modern streethouse and apartment buildings have been adapted with commercial shops on its upper levels.

living scenarios such as multi-generational families and co-living arrangements. Through its aggregation, the courtyards are able to form open atriums that maintain access to natural ventilation and an outdoors space for domestic activities. By allowing the possibility for work-live configurations, it will enable the formation of dynamic environments that link together residential spaces with commercial activities.

The proposed new type will utilize strategies learned from the case studies, while testing methods of assembling the courtyard unit type to produce three support-structures that explore: 1) the expansion of the commercial and street activity through the façade, 2) the extension of the public realm through a series of internal courtyard, and 3) the weaving of public circulation through a series of public terraces and corridors that extend through a central atrium. Each support-structure is an approach to organizing dwelling units through an interplay of configuring public spaces, corridors, and atriums. Each design option will respond to the existing site and urban fabric, while densifying its structure according to the zoning laws.

This new collective housing type responds to the social and programmatic rigidity of globalized types that are re-writing Taipei's urban landscape by proposing a flexible framework that can be localized to support existing cultural dynamics and spatial relationships. Building residents are able to engage in the design process through the creation and remodeling of prefabricated insertions that form the courtyard units within the support-structure. Through a catalogue of parts such as exterior wall panels, window units, façade additions and interior shelving partitions, residents are able to customize their own homes and businesses. The role of the architect here is to design the support-system and guide residents in the infill process through presenting examples and options of how wall types, interior layouts and business spaces can be assembled. The architect will then work with the residents to configure the homes based on their existing spatial, programmatic, and economic needs. After the implementation of the dwelling units, residents will be able to freely adapt their homes through incremental adjustments or work with architects again in the future to carry out major modifications.

Fig. 5.83 Shops on Yongkang Street are visually connected to the streets below through colourful facade additions, design elements, and advertisement panels displayed on its facade.

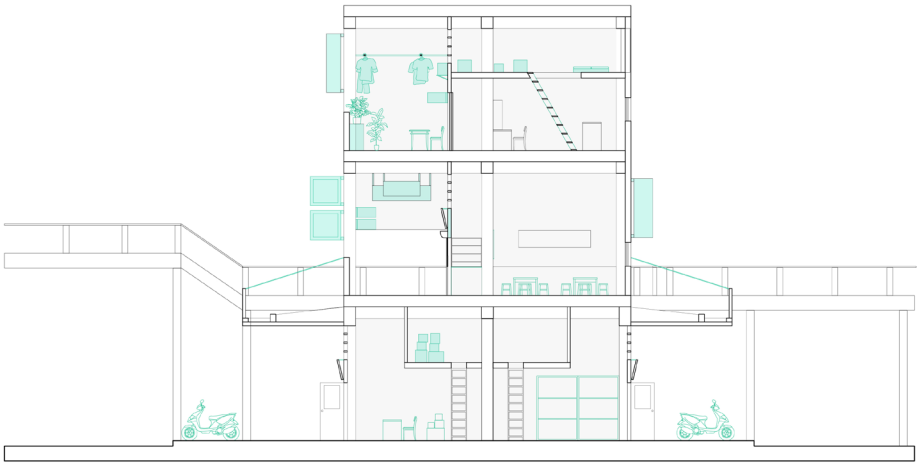


Fig. 5.84 The Zhonghua Shopping Mall was initially designed as a mixed-use residential building type with shops on the ground level and residences on the upper levels. However, over time occupants on the second and third levels adapted their homes to accommodate for small-scale shops.

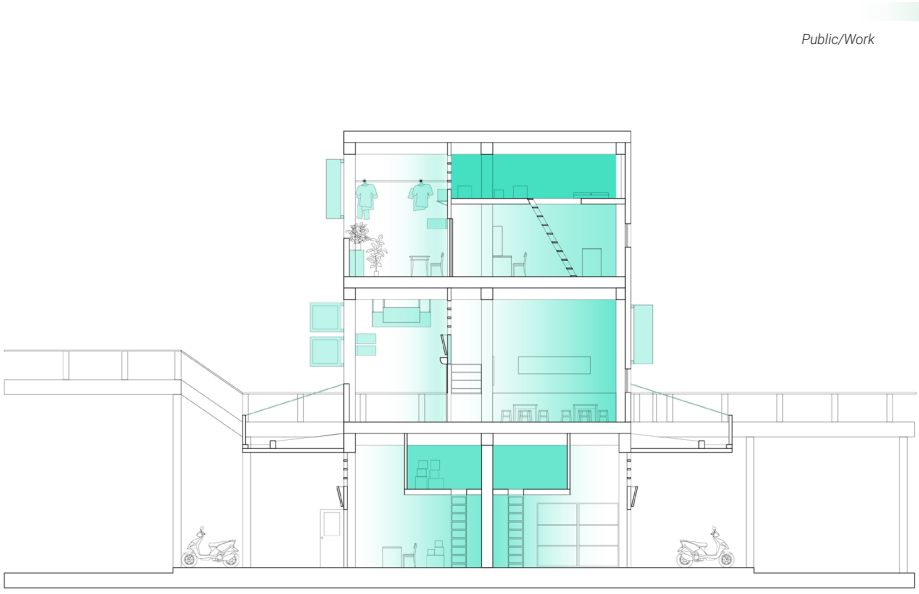
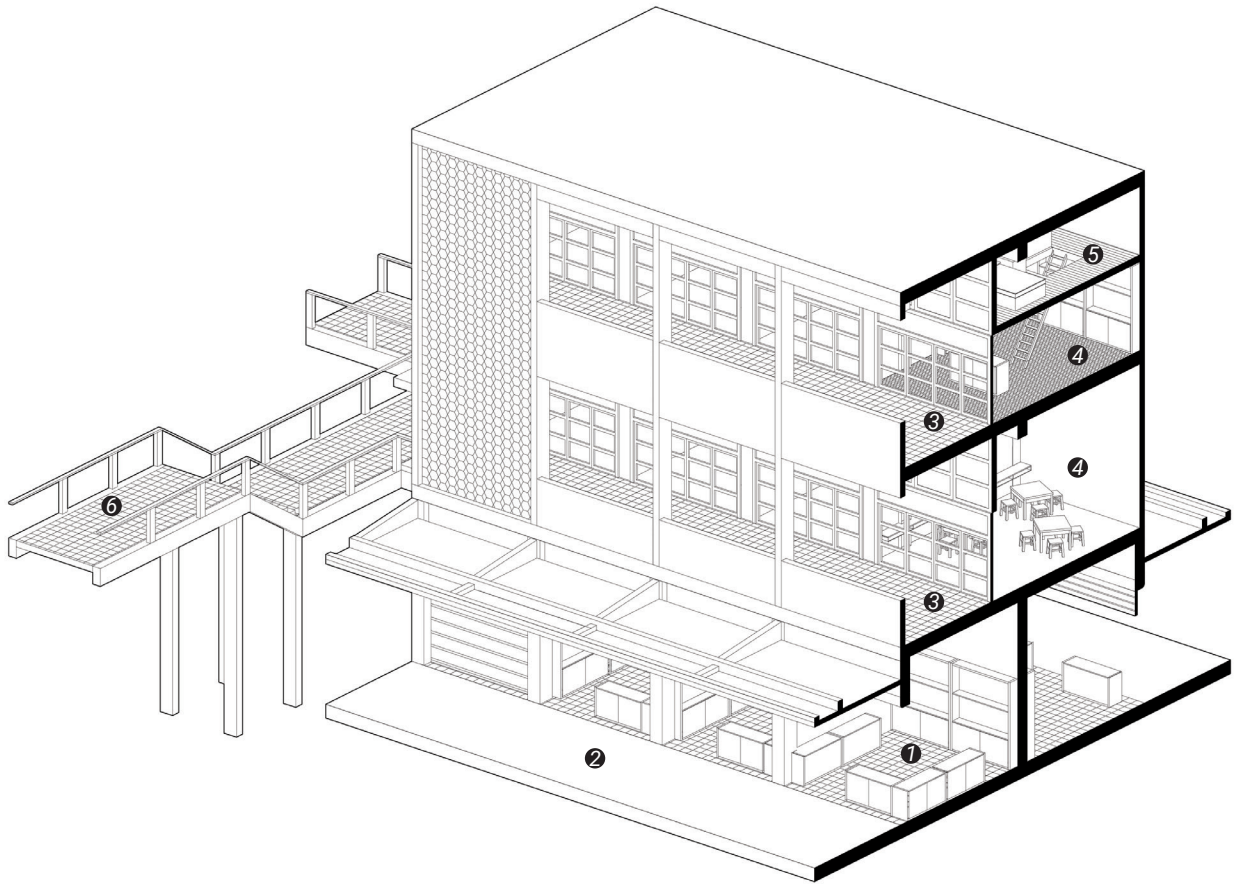


Fig. 5.85 The corridors of the Zhonghua Shopping Mall were transformed by the daily activities of residents and visitors into an extension of the public realm.

Zhonghua Shopping Mall (1961)

The Zhonghua Shopping Mall expands the commercial functions and street activities through its façade by creating urban corridors on its second and third levels. The shop units are adapted with mezzanine levels which are often used as additional storage space or compact living quarters by shop owners. Elevated walkways on the second level link together each eight blocks, to form a continuous shopping complex.



1 *groundfloor shop*
2 *ding-a-ka*
3 *upper level corridor*
4 *upper level shop*
5 *mezzanine living space*
6 *elevated walkway*

Fig. 5.86 Significant spatial elements in the Zhonghua Shopping Mall.

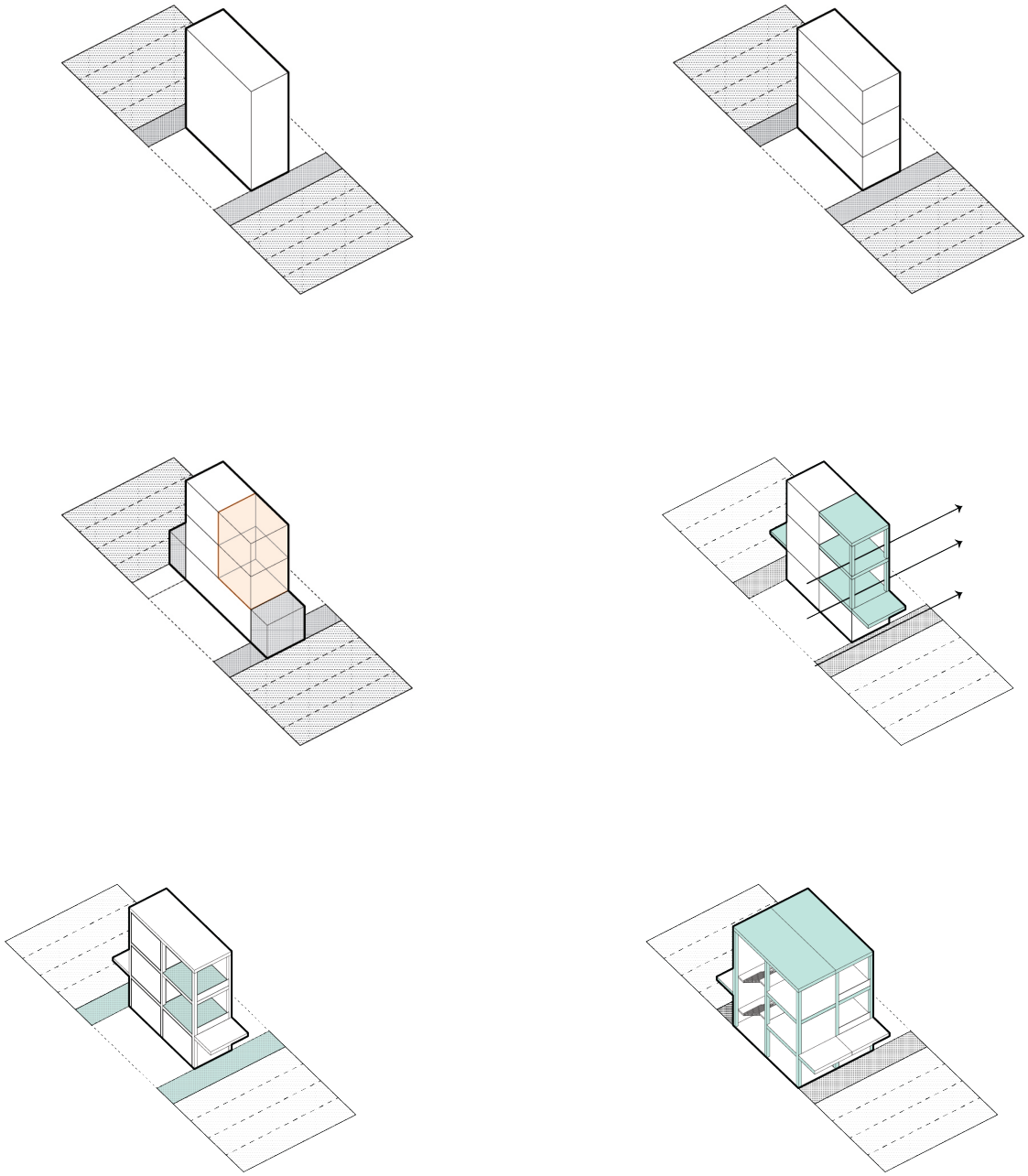


Fig. 5.87 Each block of the Zhonghua Shopping Mall is made of a series of repeated segments that together form continuous corridors on each level.

Fig. 5.88 A total of eight identical housing blocks were commissioned by the Taipei Government to be built along Zhonghua Road.

Fig. 5.89 Elevated walkways that joined together each of the housing blocks created a network of overpass bridges that stretched over the busy ground floor streets.

Fig. 5.90 The Nanjichang Housing Development has been adapted with extensions on both its street-facing facade and internal courtyard. Additions have been added to the ground-level to create night market stalls that serve customers on a nightly basis.

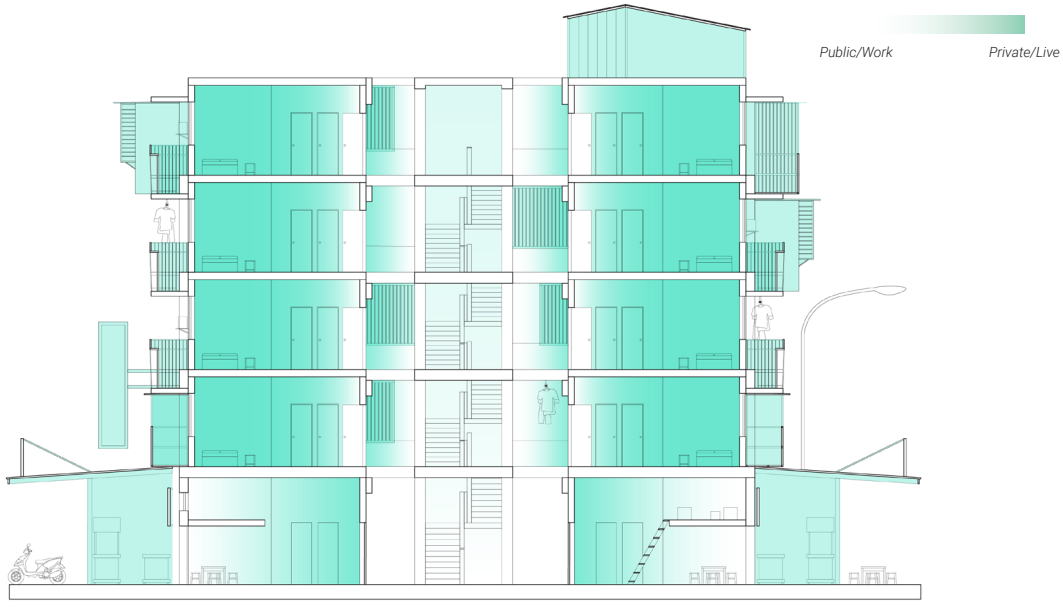
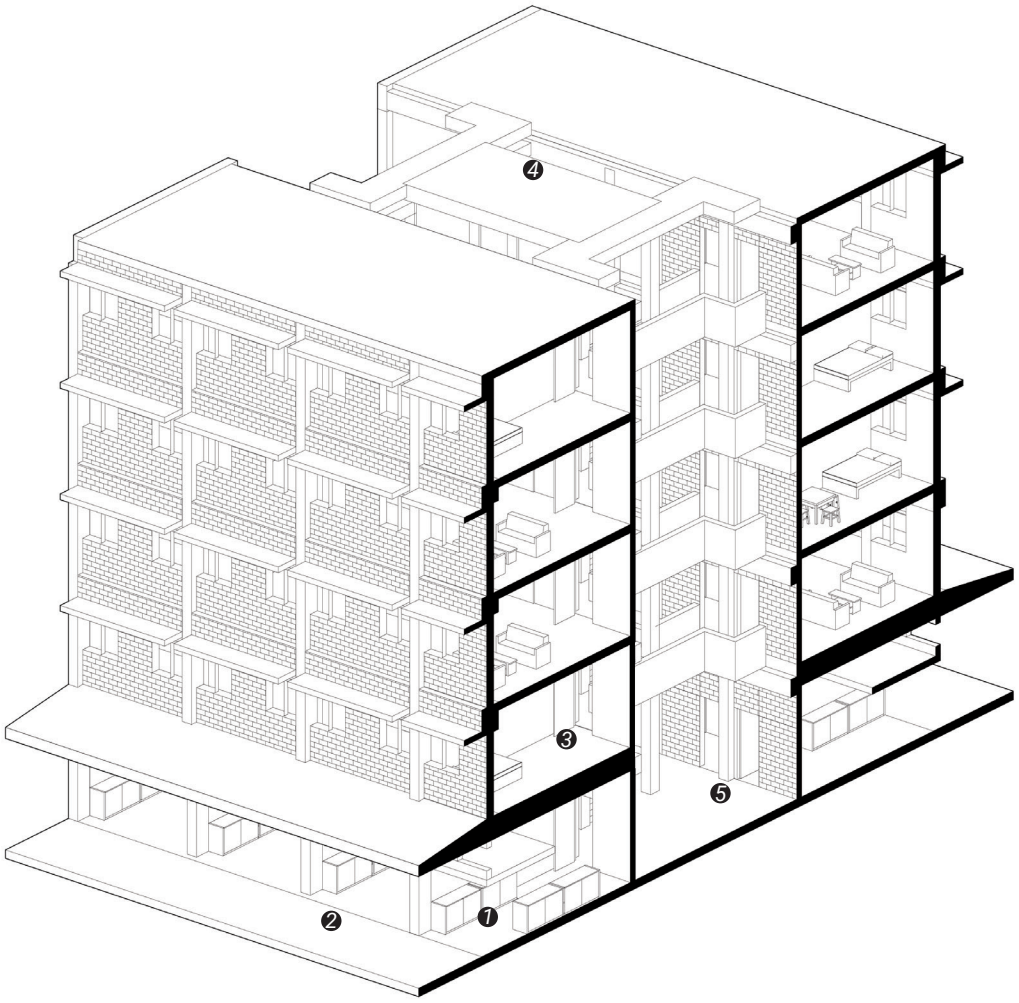


Fig. 5.91 The internal courtyards between the building segments are semi-public zones that provide direct access to each of the dwelling units through a series of open corridors and stairs.

Nanjichang Night Market and Housing Development (1964)

The Nanjichang Night Market and Housing Development is organized by two parallel rows of five-story housing structures that are joined together by corridors and staircases located in a shared public courtyard. The shops on the ground-level have been adapted to form kitchen stalls and seating areas to serve night market guests. Due to compact living spaces, the residents have created pronounced façade extensions to expand the interior space of their homes.



1 *ground floor shop*
2 *ding-a-ka*
3 *upper level residence*
4 *staircase and corridor*
5 *shared public courtyard*

Fig. 5.92 Significant spatial elements in the Nanjichang Night Market and Housing Development.

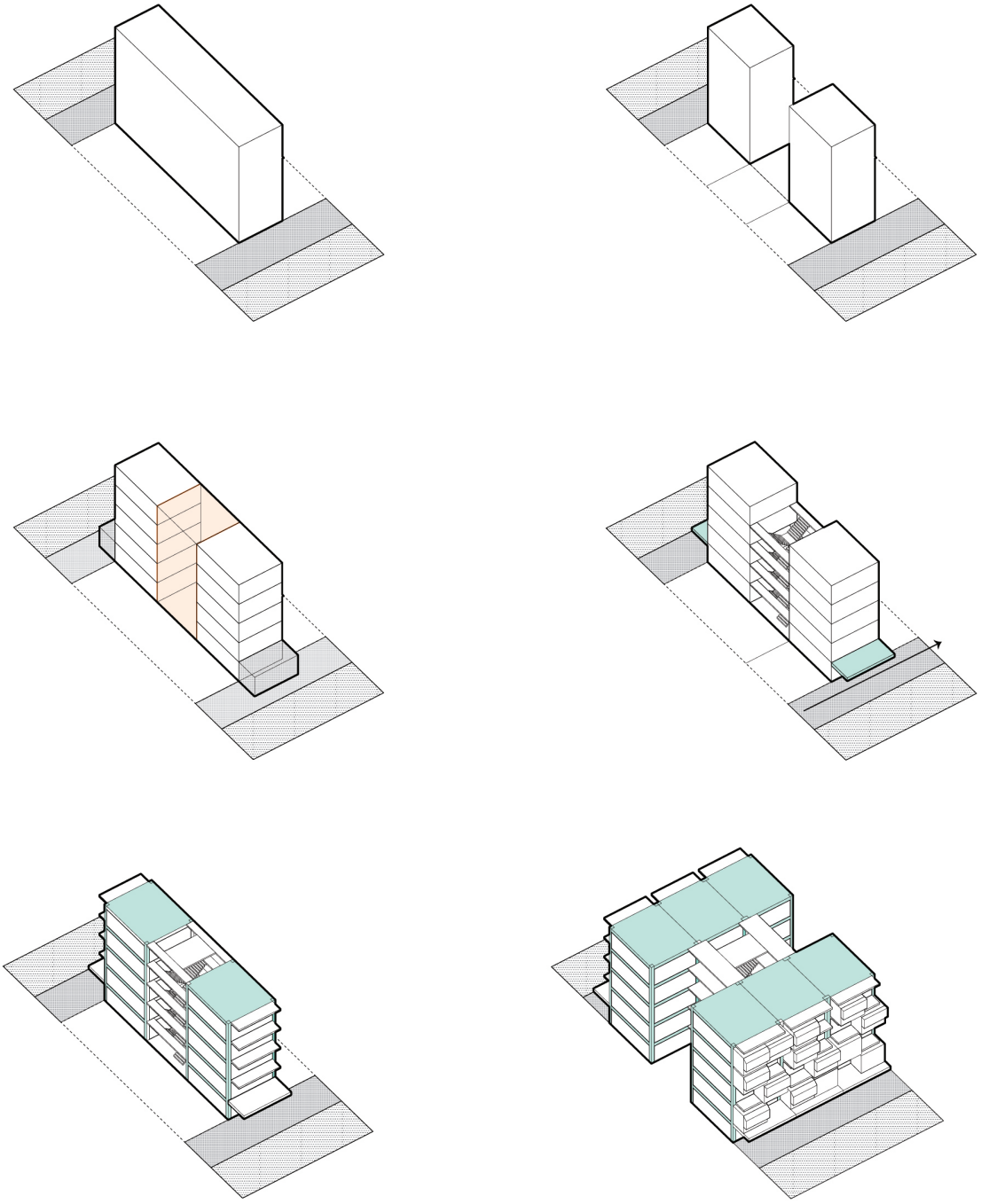


Fig. 5.93 Each segment of the Nanjichang Housing Development is oriented towards the street and joined through a central courtyard atrium.

Fig. 5.94 The facade of the Nanjichang Housing Development is covered with facade extensions that households have added to increase their interior living spaces.

Fig. 5.95 Canopies and lightweight steel structures are used on the ground level to construct night market stalls that are filled with kitchen trolleys and seating spaces.

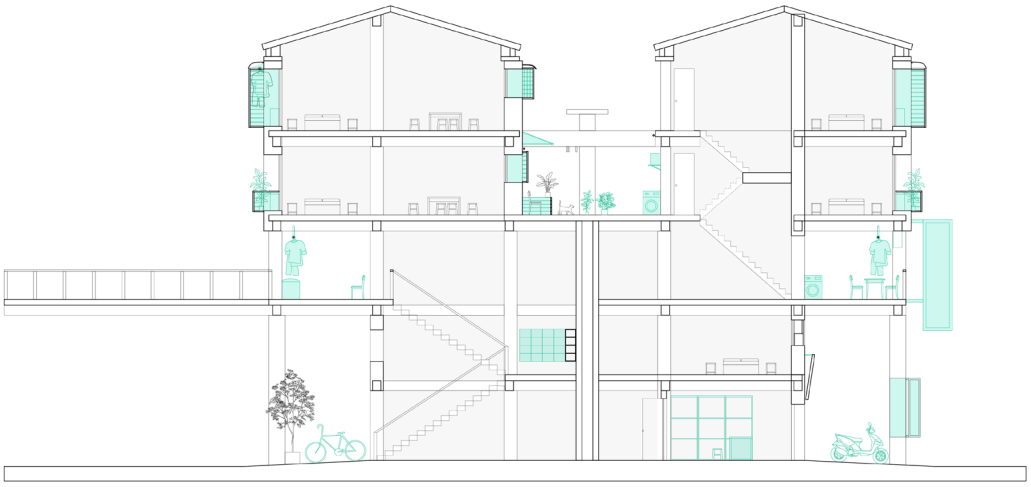


Fig. 5.96 The exterior corridors and terraces of the Wanhua Huajiang Housing Development has been significantly infilled with household furniture, appliances, and potted plants. Each residential unit has adopted its surrounding environment as extensions of their home.

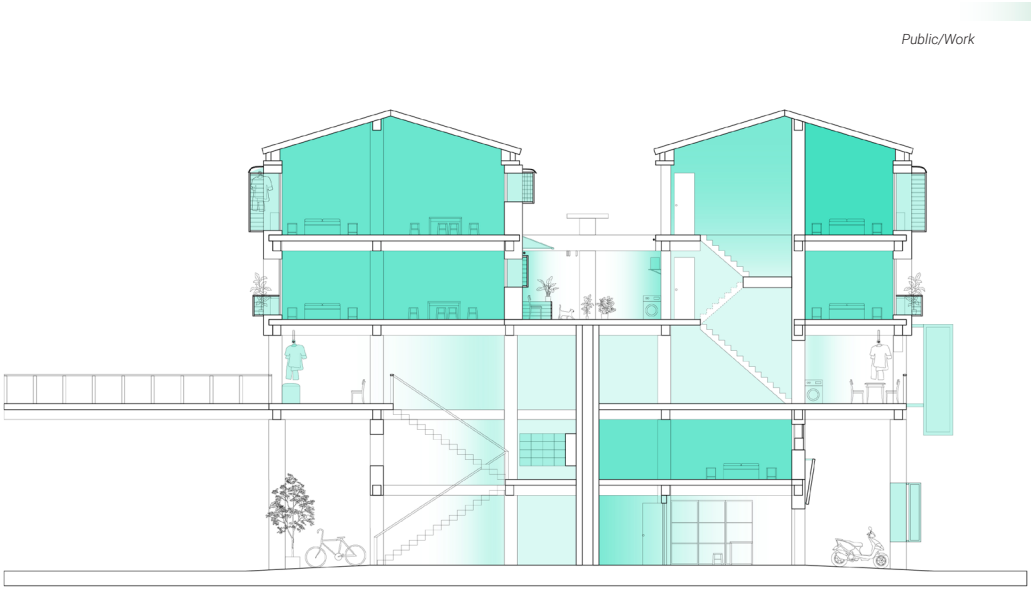
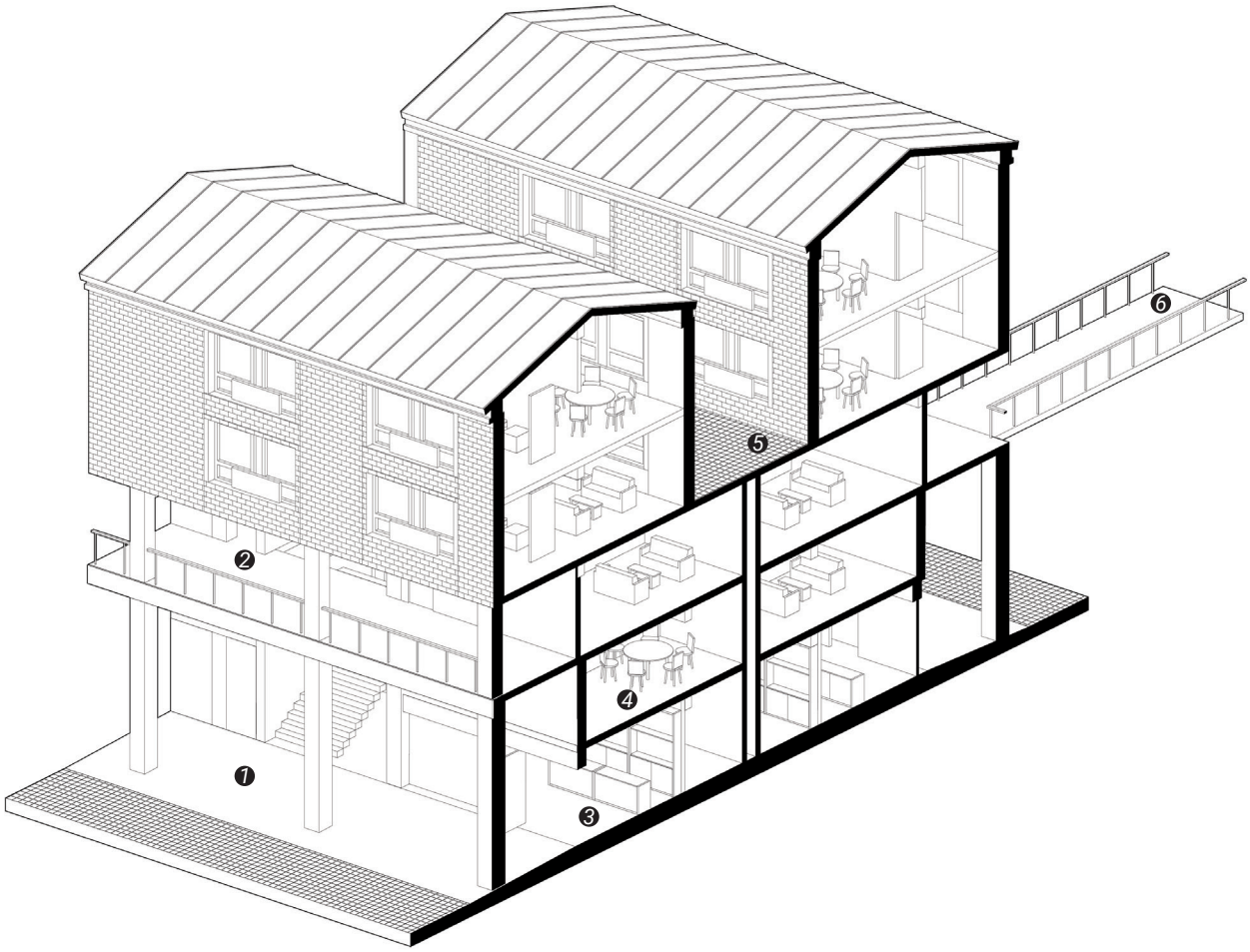


Fig. 5.97 The circulation of the building weaves the public realm through the residential units creating distinct zones for public activity and increased privacy.

Wanhua Huajiang Housing Development (1960)

The Wanhua Huajiang Housing Development uses three levels of corridors that are each connected to the ground level to weave the public realm through its structure. The first and second level *ding-a-kas* expand the ground plane through a series of stairs and bridges that connect to neighbouring units across the street. The third-level corridor is a private communal outdoor space shared by residents on the upper levels.



1 *ground floor ding-a-ka*
2 *second level ding-a-ka*
3 *ground floor shop*
4 *living space above the shop*
5 *third level outdoor corridor*
6 *elevated walkway*

Fig. 5.98 Significant spatial elements in the Wanhua Huajiang Housing Development.

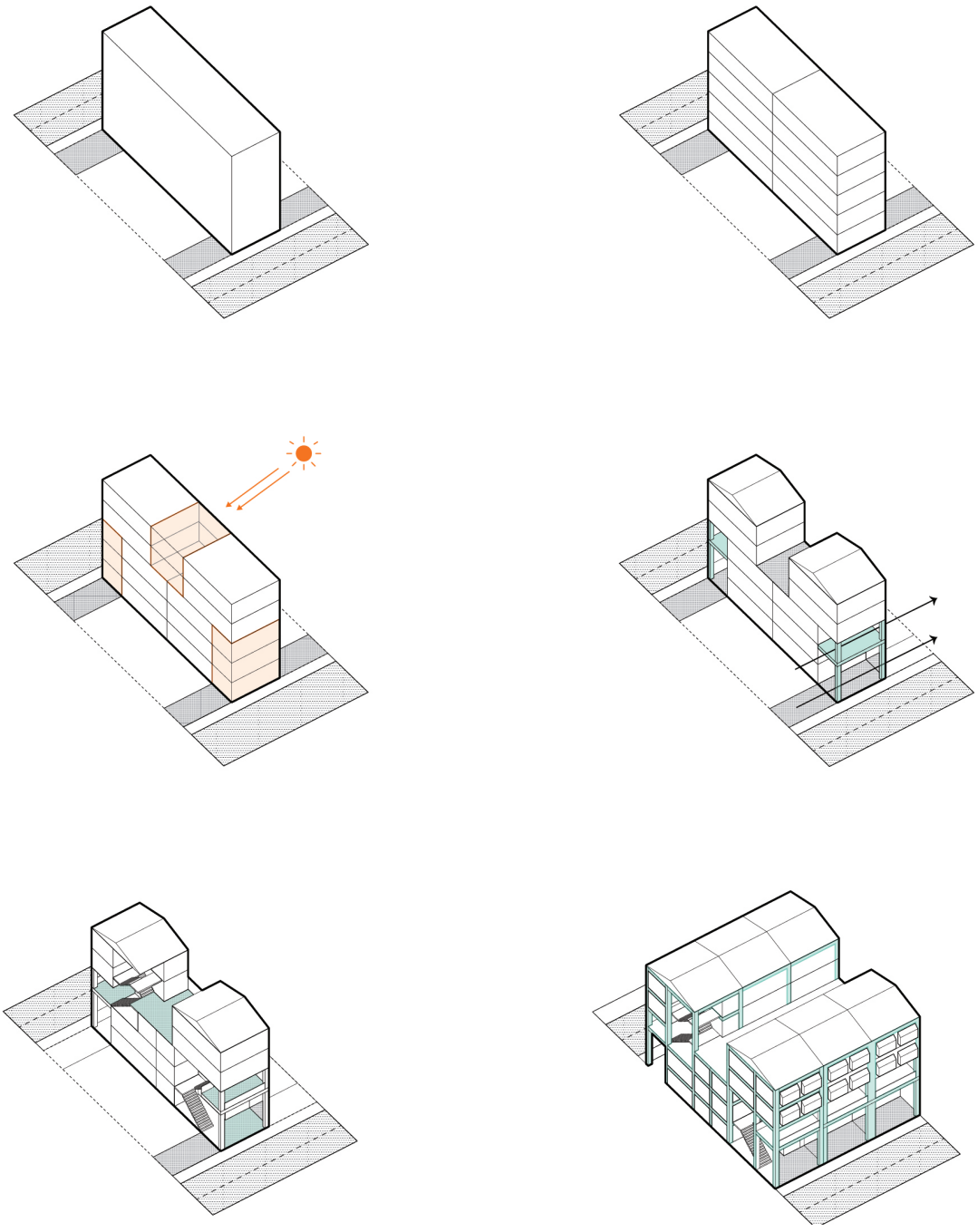
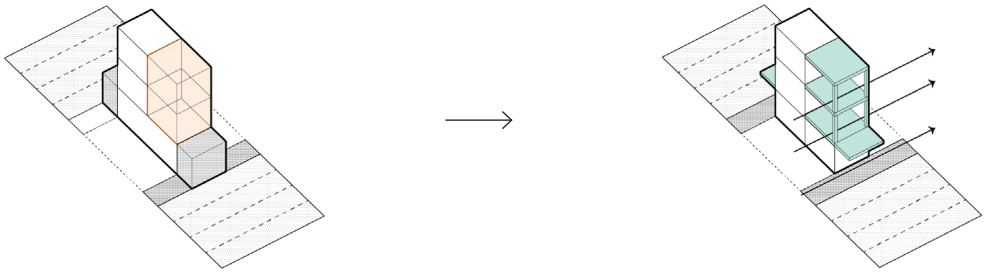


Fig. 5.99 Each segment of the Wanhua Huajiang Housing Development is mirrored and joined together at the top level terrace. Each level creates a different spatial experience through the use of public corridors, terraces and bridges.

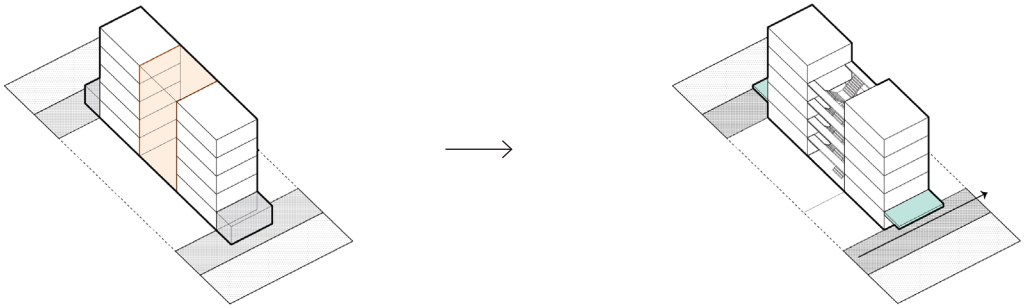
Fig. 5.100 The upper level corridor serves as an open-air terrace that is used by residents to create gardens and patios outside their units.

Fig. 5.101 The rows of housing segments are joined together on the second level by bridges that span across the streets.

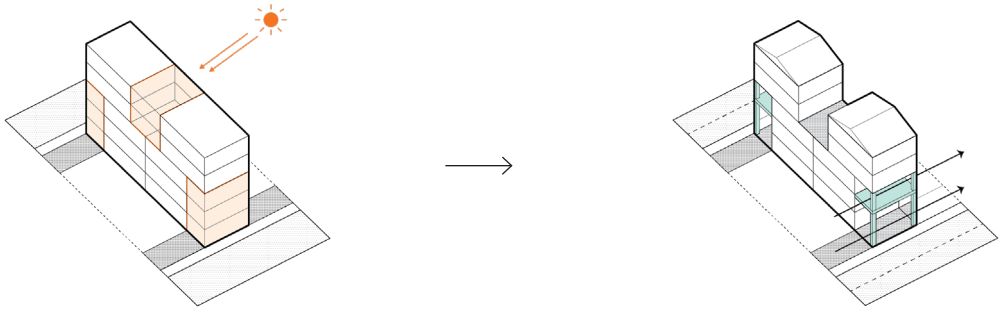
Each of the three emergent types uses a set of strategies to expand the urban realm through the upper levels of their structure by weaving together urban corridors or courtyards. Three iterative design options will be produced to test these strategies through different methods of assembling courtyard unit types.



1 *Chunghua Shopping Mall*

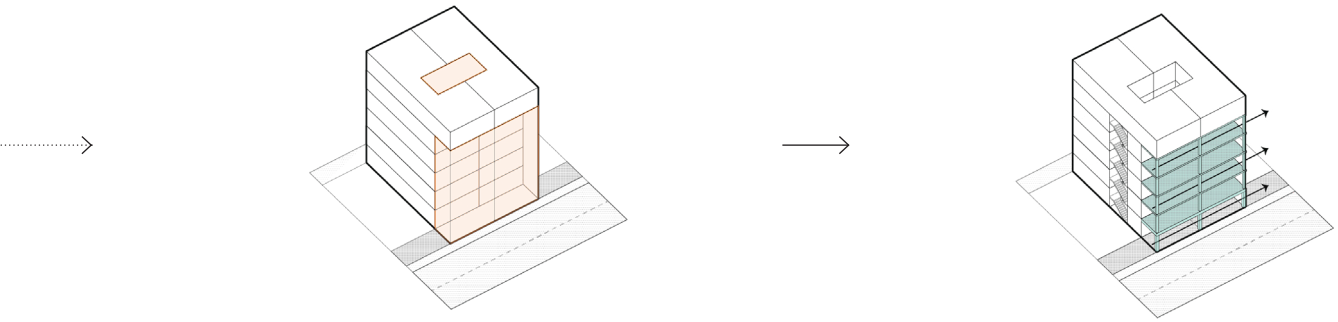


2 *Nanjichang Housing*

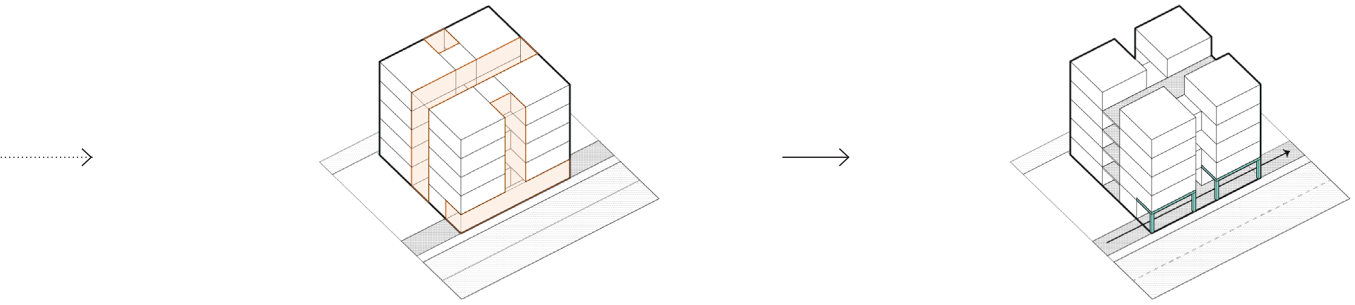


3 *Wanhua Huajiang Housing*

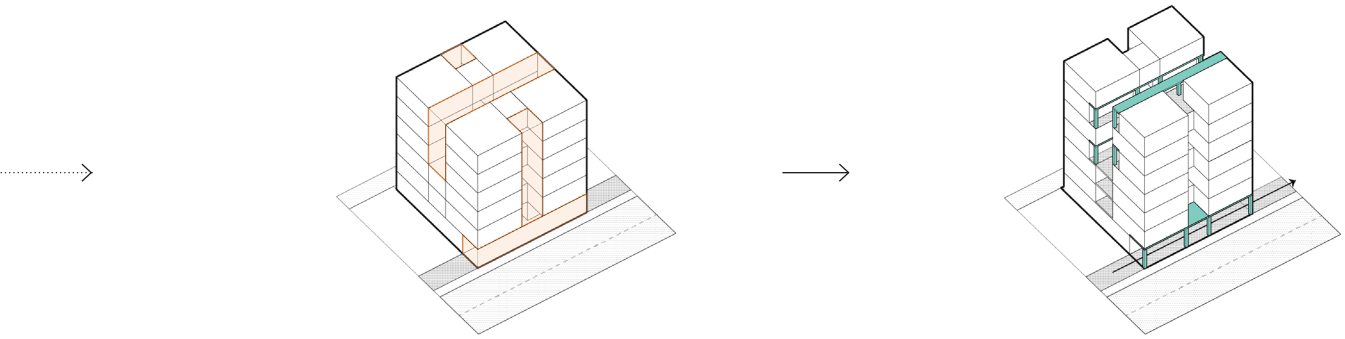
Fig. 5.102 Each emergent housing type is reduced here into its basic segments to study the operations and strategies used to formally organize the type. The segments are then assembled to create support-structures that arrange households and businesses.



1 *The expansion of the commercial and street activity through the façade.*



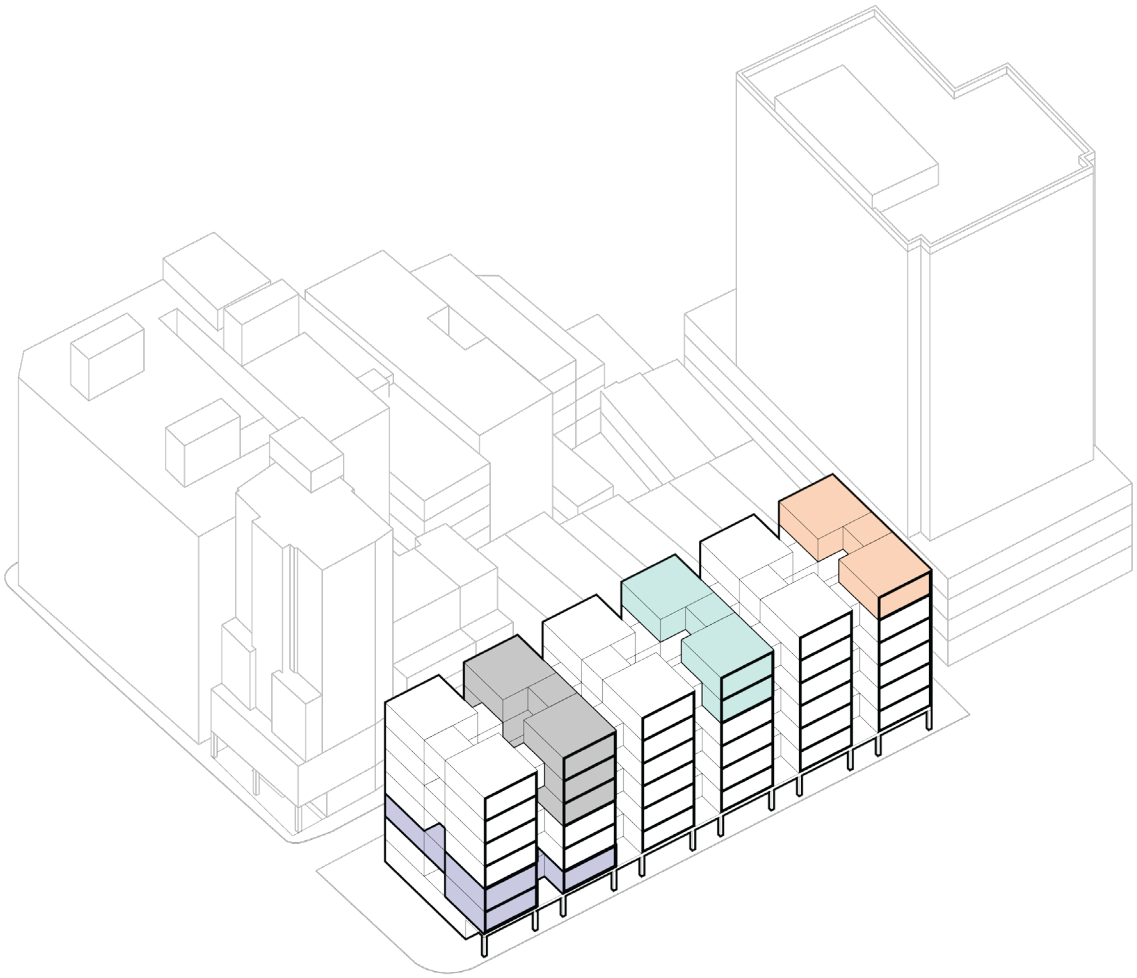
2 *The extension of the public realm through a series of internal courtyard.*

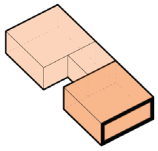


3 *Weaving the public circulation through a series of public terraces and corridors that extend through a central atrium*

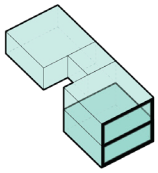
Live-Work Scenarios

The courtyard type is regenerated here to create a modular system for organizing live and work segments throughout its “support-structure”. The basic unit is a 64 square metre (690 square foot) module that can accommodate for small families and businesses. Several units can be assembled together to create different mixtures of family arrangements and business scales.

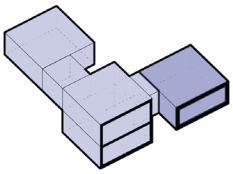




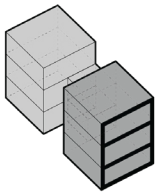
A *X2 Units (128 sqm or 1380 sqf)*
Small family (2-3 persons)
Bubble Tea Shop



B *X3 Units (185 sqm or 2000 sqf)*
Medium family (2-4 persons)
Breakfast Dumpling Shop



C *X4 Units (257 sqm or 2770 sqf)*
Large family (4-6 persons)
Interior Design Office



D *X6 Units (370 or 3980 sqf)*
Co-Living arrangment (6-10)
Artist Studio

Fig. 5.103 The courtyard unit type provides a versatile method for stacking live-work modules in multiple directions and levels.

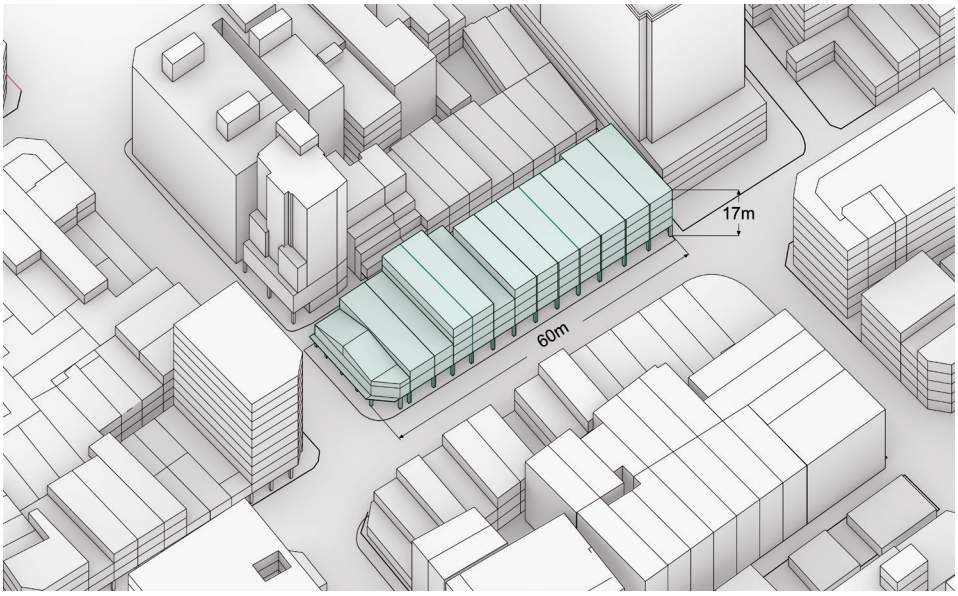


Fig. 5.104 The streethouses on the project site are spaced in 5-6 metre intervals along Section 2, Yanping North Road and range from three to five storeys in height.

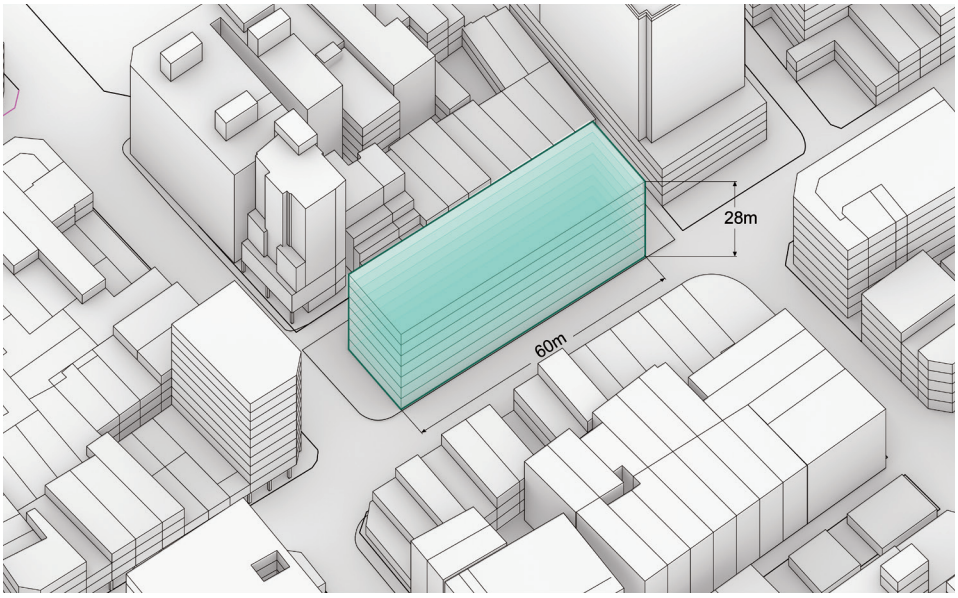


Fig. 5.105 After applying set-back measures and calculating the building coverage ratio, a building massing that uses the entire buildable ground floor area can be constructed 7 storeys tall and 28 metres high.

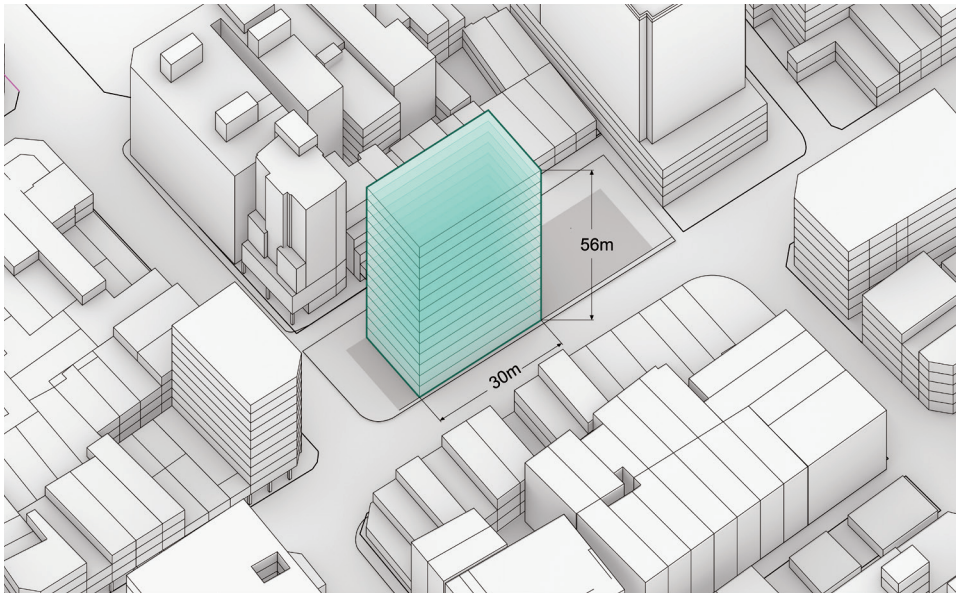


Fig. 5.106 A mid-rise option of 14 storeys can be built if half of the buildable site is used.

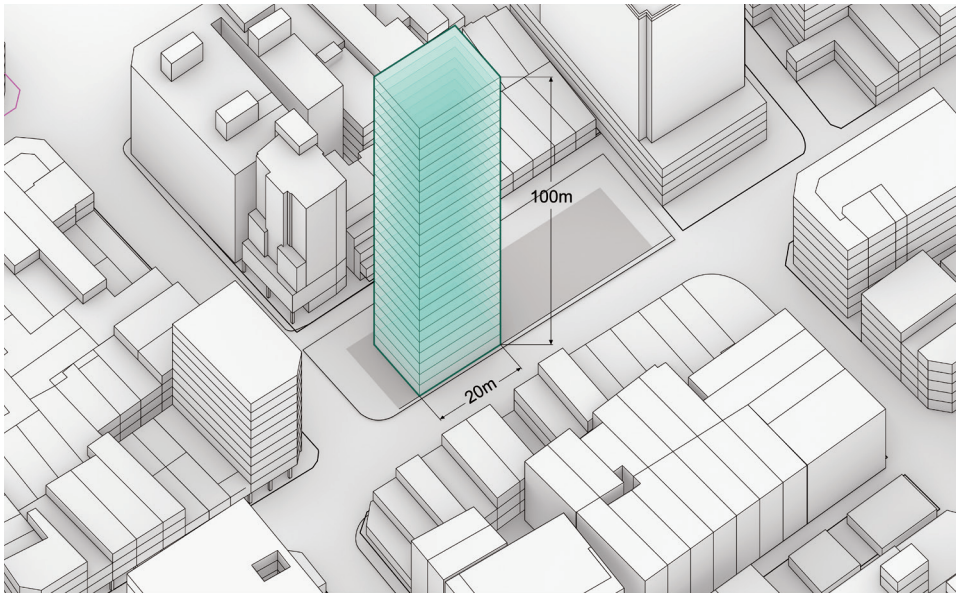


Fig. 5.107 A 25 storey tall building on this site would reach the 100 metre height limit. This approach to maximizing verticality is likely used by developers interested in constructing luxury housing options.

Design Option 1

The first design iteration looks to expand the commercial and street activity on the ground plane through the façade of the building. This approach speculates the need for increasing housing density and affordable commercial spaces in Datong District, Taipei. Due to the large-scale redevelopment of streethouses in Taipei, many family-run and small-scale businesses have closed down or are unable to find affordable shop spaces for lease. The commercial spaces built on the ground floor of luxury condominiums are not viable options due to their high cost and they are typically rented out to corporate businesses, convenience stores or offices.

This new type extends the 3.6-metre ding-a-ka on the existing ground floor through the east façade facing Section 2, Yanping North Road. Doing so creates the opportunity for multiple levels of commercial spaces to form a visual connection to the street. The façade becomes a series of stacked urban corridors that are joined by stairs that weave through each level. The façade is the primary circulation that connects the storefronts, residences, and ground plane together on a vertical surface. Fire escape stairs and elevators are located on the façade for users that require direct access to their homes or specific shops.

The courtyard unit types are oriented perpendicular to Section 2, Yanping North Road. The modules located on the west-end facing the laneway are for private living spaces, whereas the modules on the east-end can be adapted into commercial shops. The courtyard units are designed to be 7.5 metres in width to fit into the urban fabric of the existing streethouses. They are made wider than 5 metres to allow for larger and more flexible interior spaces. Each pair of adjoining units form a central courtyard that provides access to ambient light and natural ventilation. The courtyard voids are joined together by a secondary circulation system made of stairs and corridors that provide residents communal gathering spaces that are connected to the building amenities and the rooftop terrace.

The facades and storefronts are prefabricated assemblies made of lightweight steel panels that are attached to the concrete support-structure. The multiple levels of urban corridors are spatial elements that can be actively customized by the residents. They can be used by shops as ding-a-kas to display shop goods, create seating spaces, and decorate their storefronts. Outside of the façade, store signs, shading devices, panels and windows can be used to adapt the functionality of the storefronts, while also serving as a design feature that advertises the shop to pedestrians below.

This type is a flexible framework that can fluidly transform based on socio-economic changes and demands from society. Each module on the street-facing façade can be rented out to other businesses, combined with neighbouring units, or converted into a residential space. Households are able to use these modules as a source of income or as a way to grow their homes and businesses. Overtime, the shops and residences will naturally self-organize to create a mosaic of private and public activities on its façade.

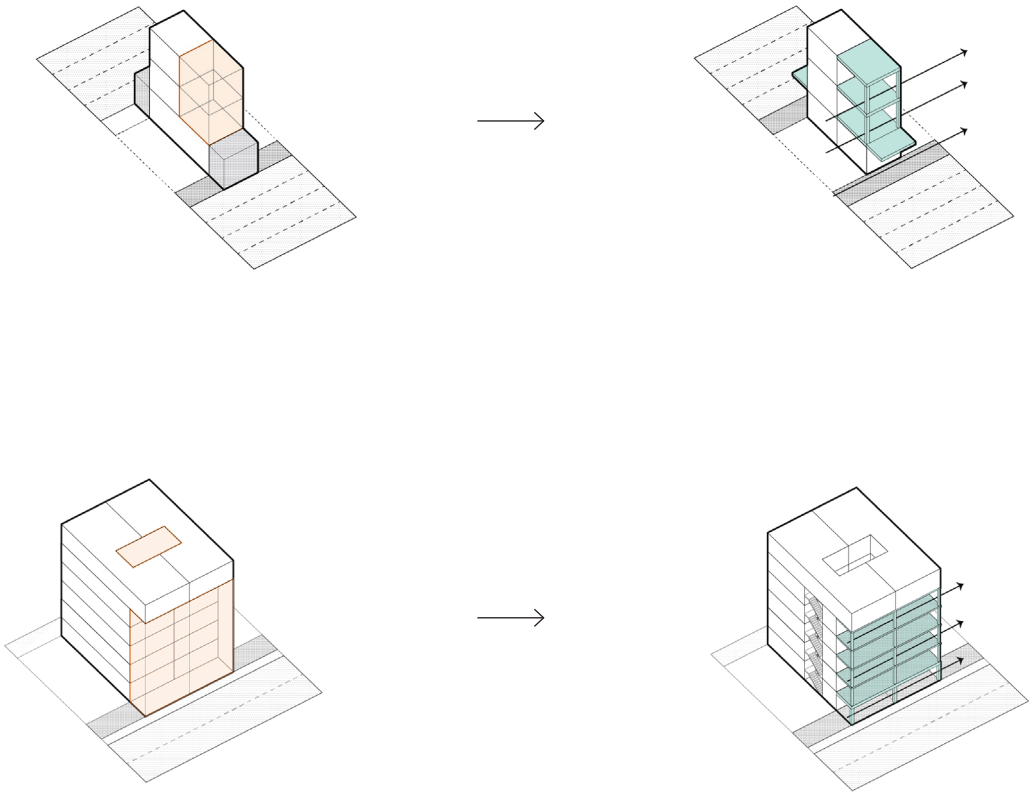
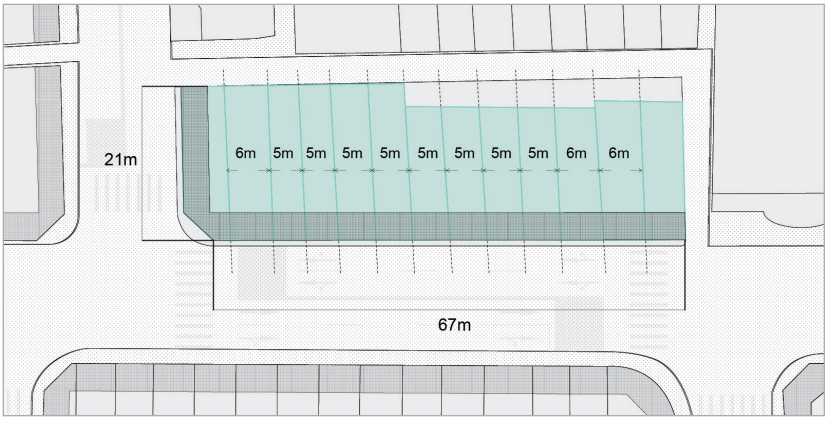


Fig. 5.108 Design Option 1 Strategy: The expansion of commercial and street activity through the façade.

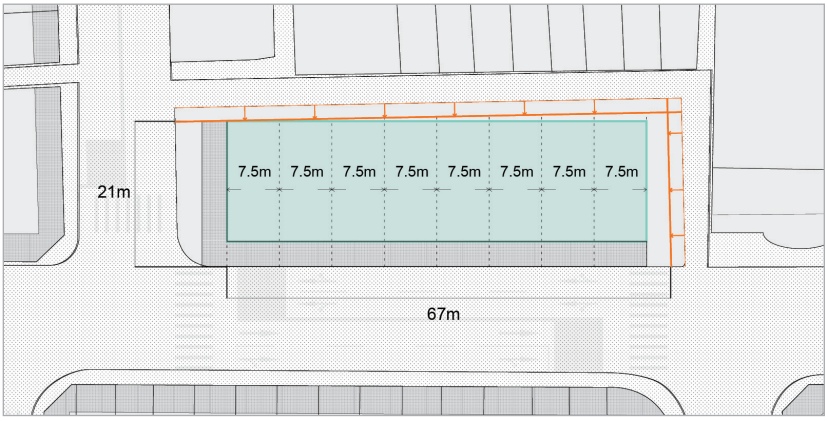
Existing Site

The existing block consists of streethouses that are spaced 5-6m along Sec. 2, Yanping North Road.



Courtyard Unit Types

The proposed courtyard modules are designed to be 7.5m wide and spaced regularly.



Programmatic Orientation

The commercial and public spaces are oriented along Yanping North Road, whereas the private residential spaces are located towards the alleyway.

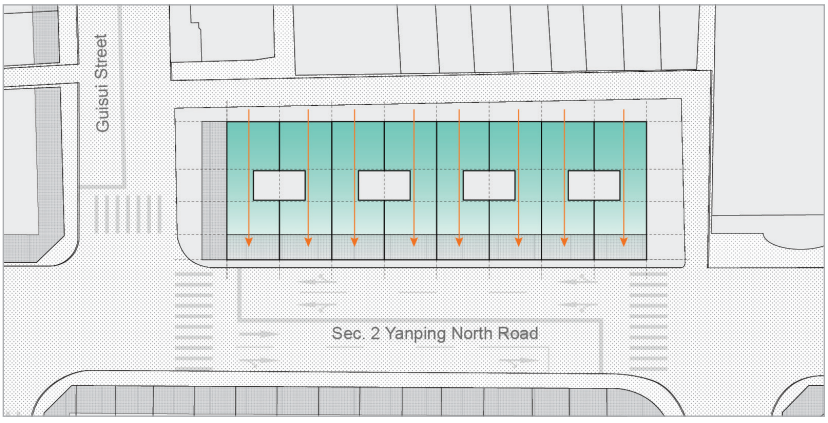


Fig. 5.109 The first design iteration orients the courtyard units towards Yanping North Road, providing each dwelling a visual connection to the street.

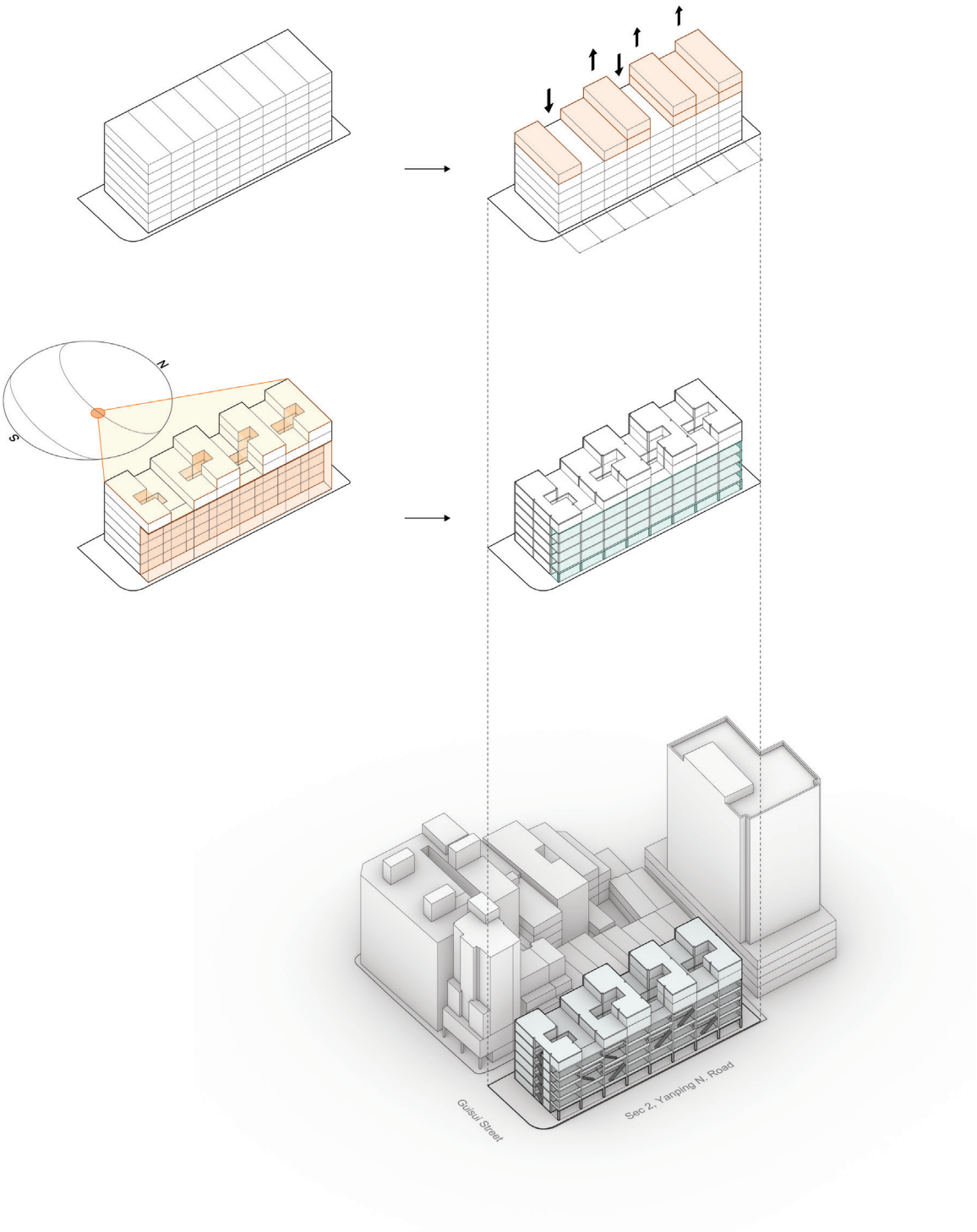


Fig. 5.110 The courtyard units are stacked and mirrored to created a series of atriums that allow for natural light through the dwellings.

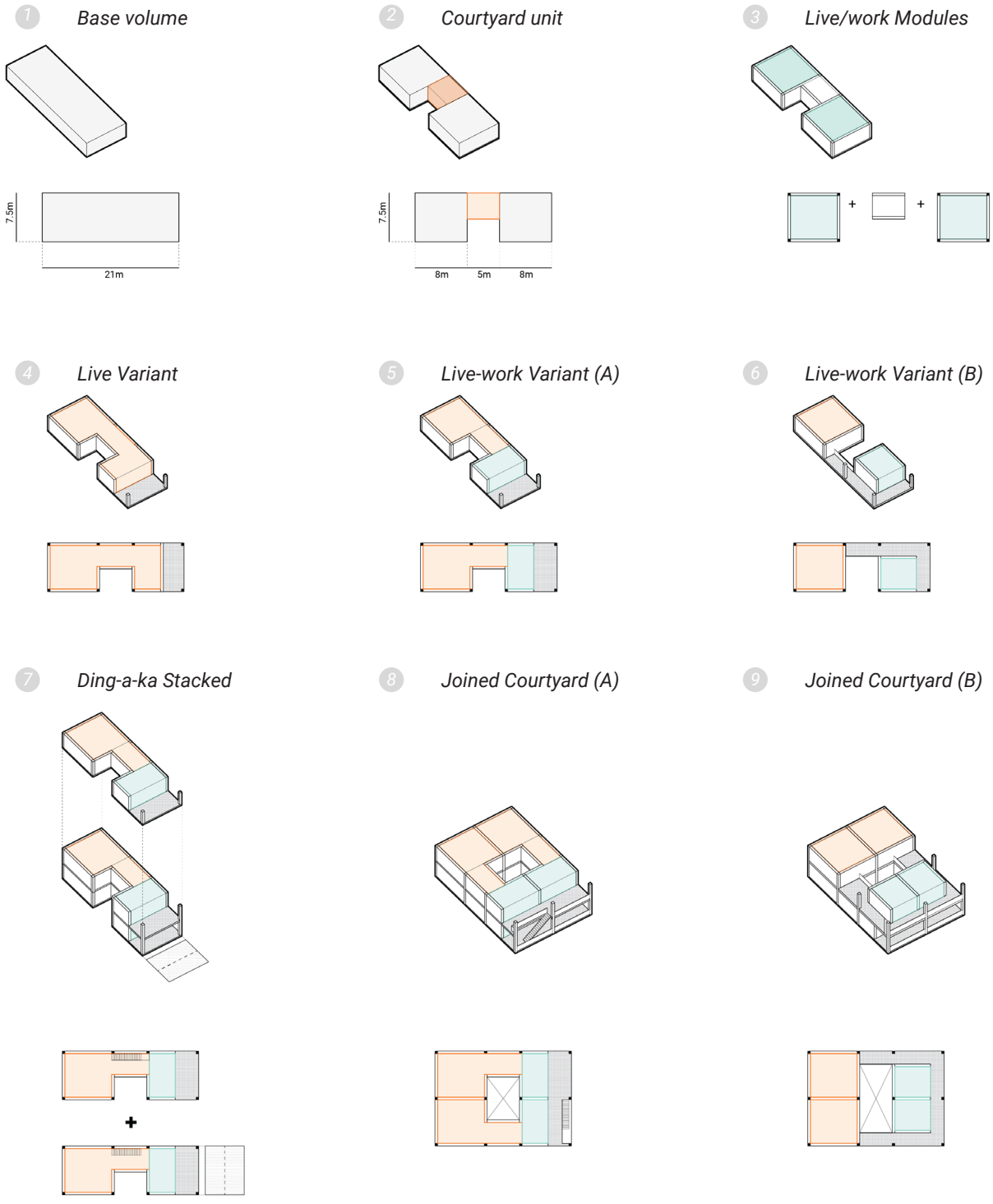
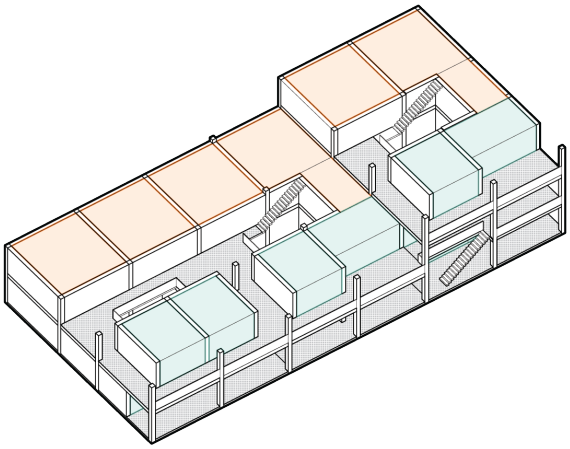


Fig. 5.111 Three variants of the courtyard unit can be assembled to create different live-work configurations.



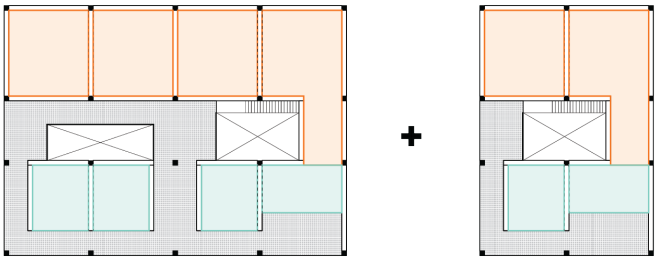


Fig. 5.112 When pairs of courtyard units are joined together, they form an internal circulation corridor.

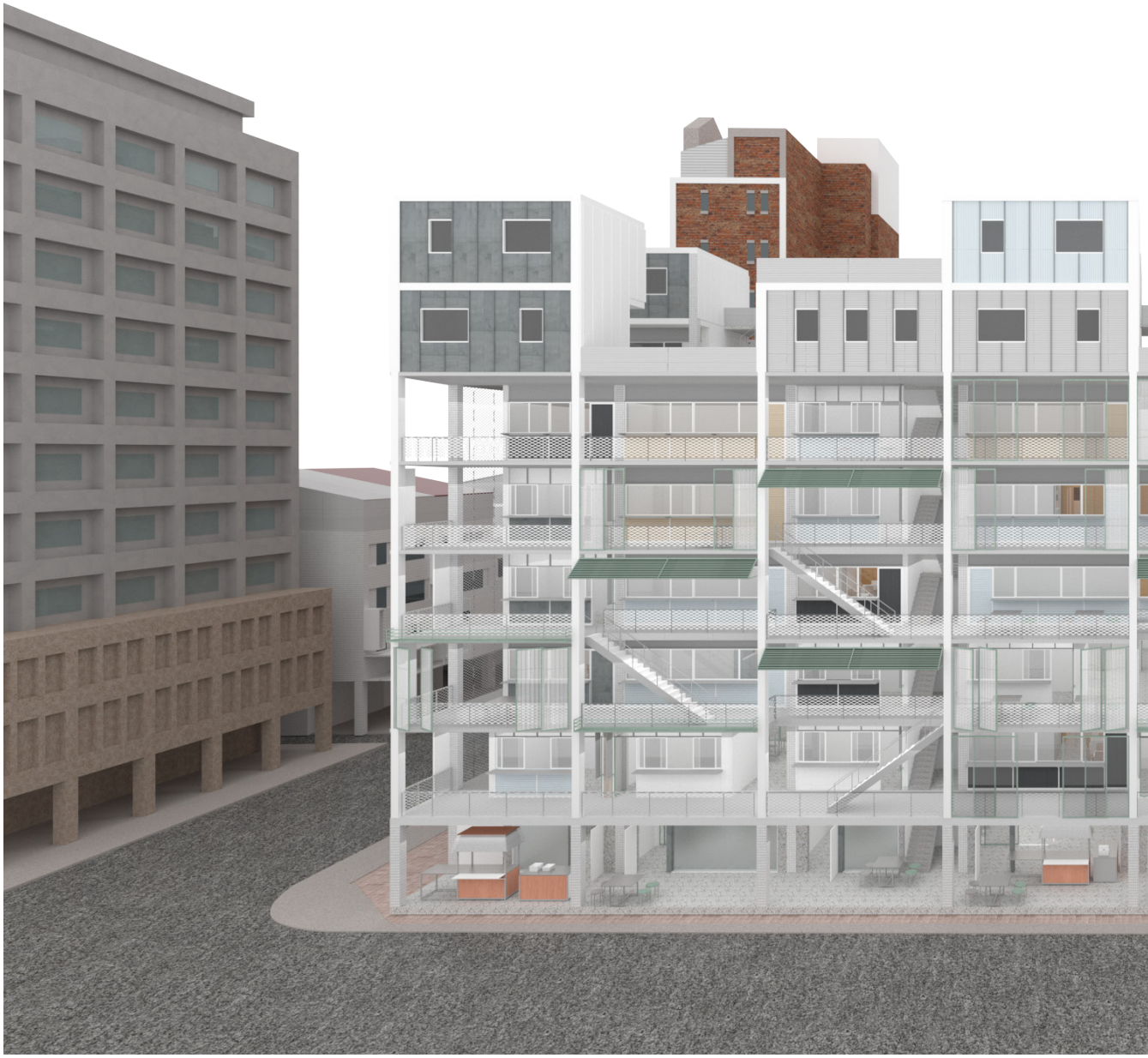


Fig. 5.113 The facade is a publically accessible extension of the street, where residents and customers are able to meander through the stairs and corridors formed by the courtyard units.

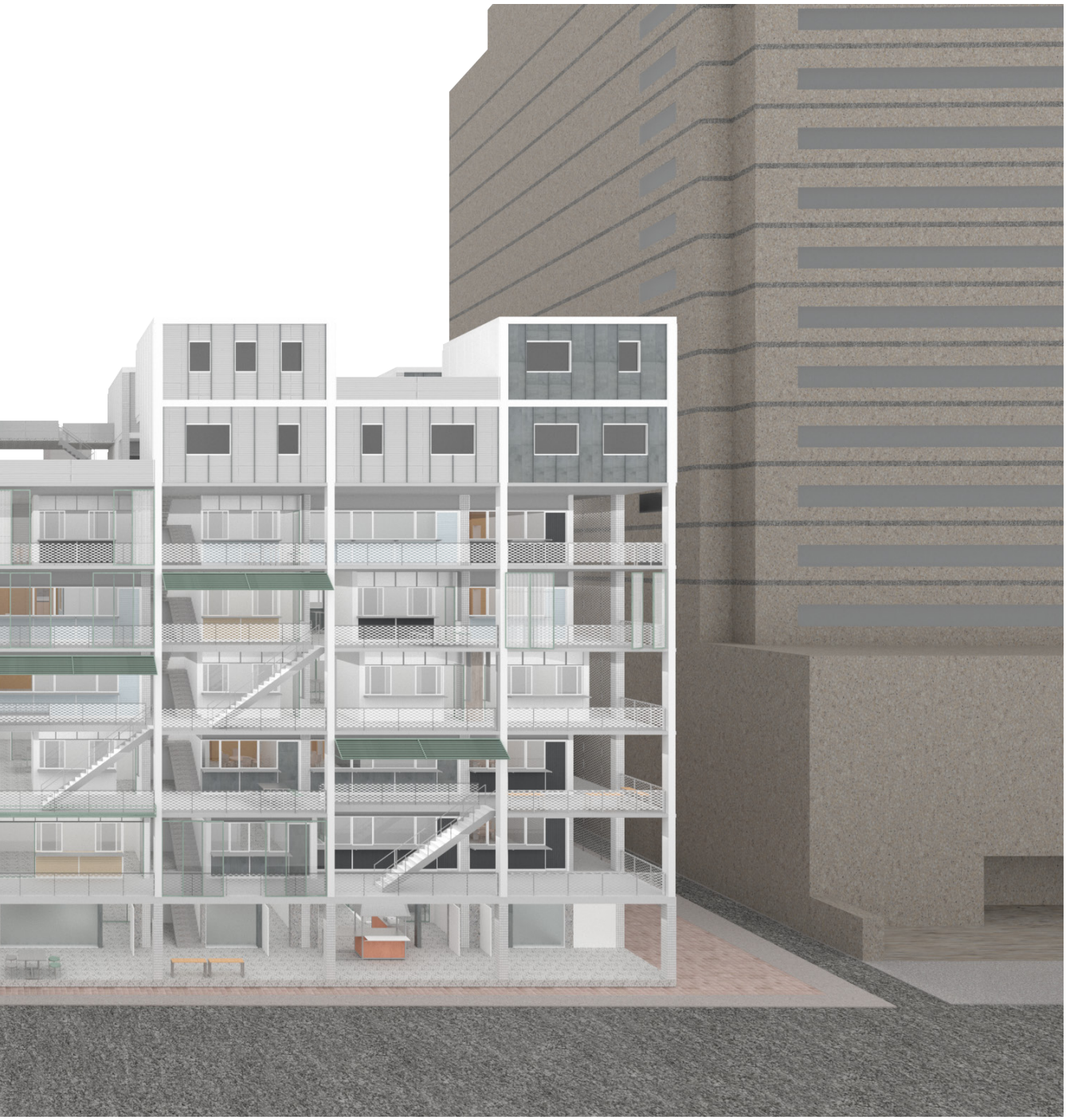


Fig. 5.114 The interior courtyard provides a semi-private circulation network for the building residents to access the building amenities and communal rooftop.

Design Option 2

The second design option builds from the first by shifting the public functions on the façade into the interior courtyard. Doing so alleviates the axial orientation of the courtyard units away from Section 2, Yanping North Road and focuses the circulation internally. This allows the commercial and residential units to naturally self-organize and express its activities through all four facades of the building.

This iteration introduces a new strategy of assembling courtyard unit types bidirectionally. Individual dwellings are stacked in alternating orientations, parallel and perpendicular to the surrounding streets. Doing so creates greater flexibility for the units, as they can grow along the entire perimeters of the supports-structure. Larger businesses and households can take advantage of this housing form by accumulating multiple segments that span vertically and horizontally.

Through this assembly, voids are created between the dwellings to provide additional spaces that can be infilled by its occupants or shared as communal outdoor spaces. The open voids work in concert to allow for cross ventilation and ambient light to spread through the courtyard atrium.

Visitors enter through the ding-a-ka on the ground level into the central courtyard where stairways and elevators provide access to the residences, amenities, and commercial spaces. The central corridors are designed to allow visitors meander through a series of terraces, courtyards, and corridors. This interplay of spatial elements re-creates an alleyway experience with shops that open on both sides of a narrow public corridor. The roof top is an open platform for visitors to gather and commercial spaces to expand. It is a public realm that can be used for community events and markets.

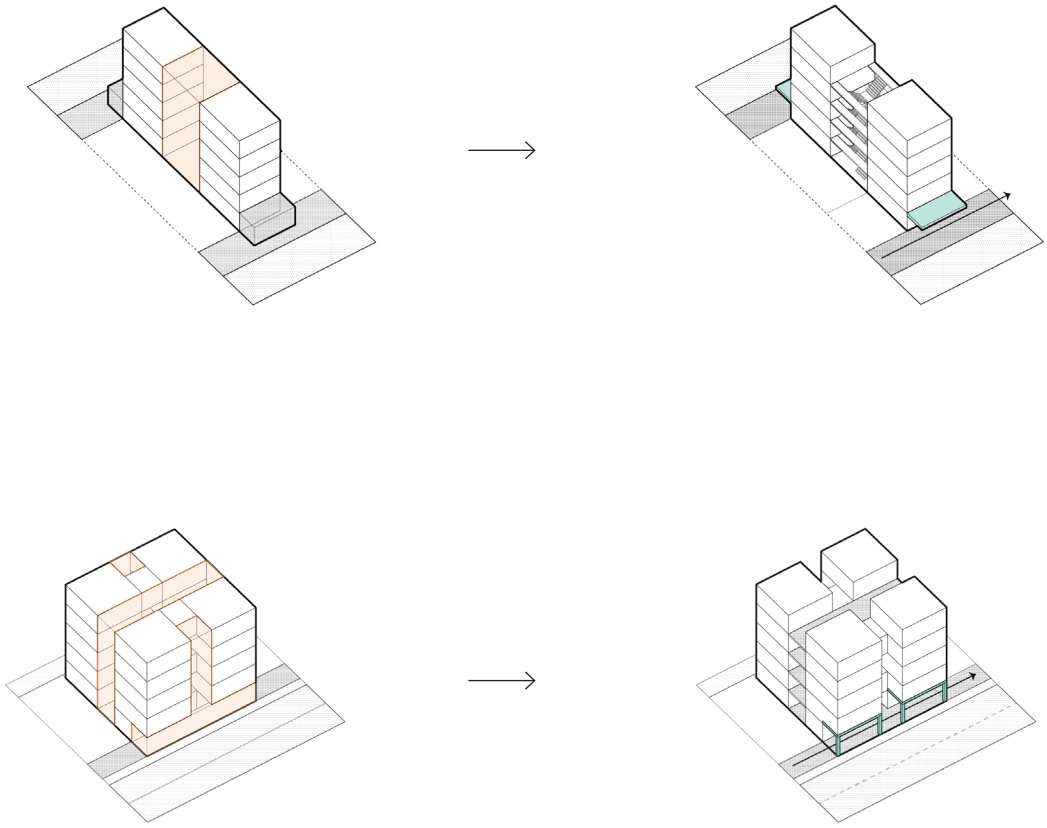
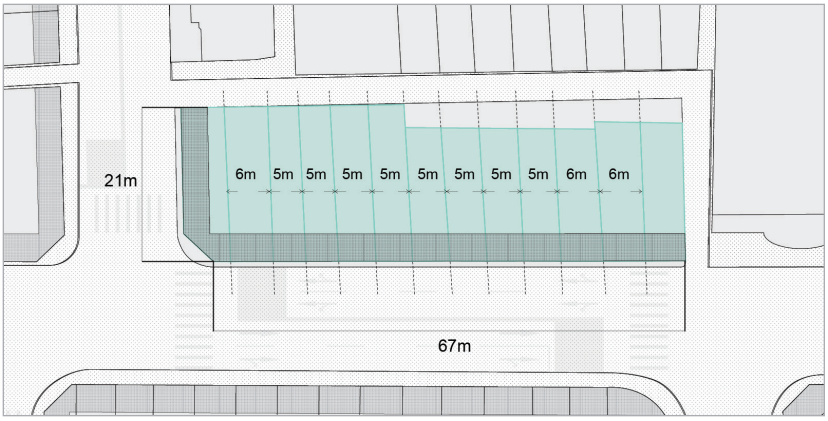


Fig. 5.115 Design Option 2 Strategy: The extension of the public realm through a series of internal courtyards.

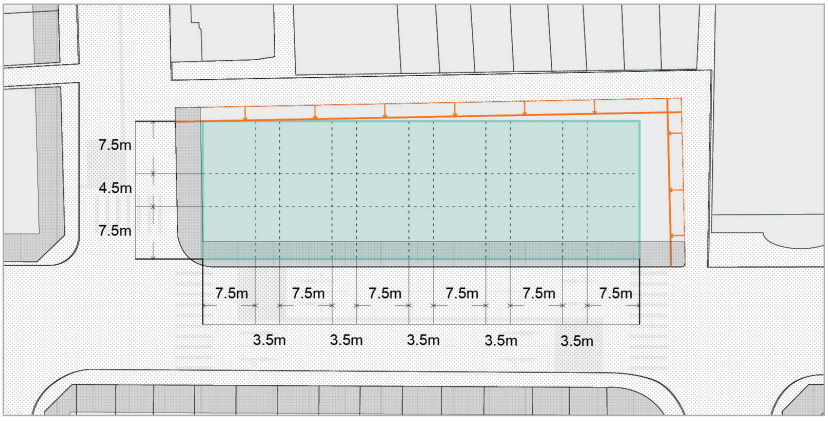
Existing Site

The existing block consists of streethouses that are spaced 5-6m along Sec. 2, Yanping North Road.



Courtyard Unit Assembly

The courtyard unit types are stacked in alternating dimensions creating voids between each dwelling.



Programmatic Orientation

By internalizing the public realm, the second design option orients the private functions of the building towards the perimeter of the block.

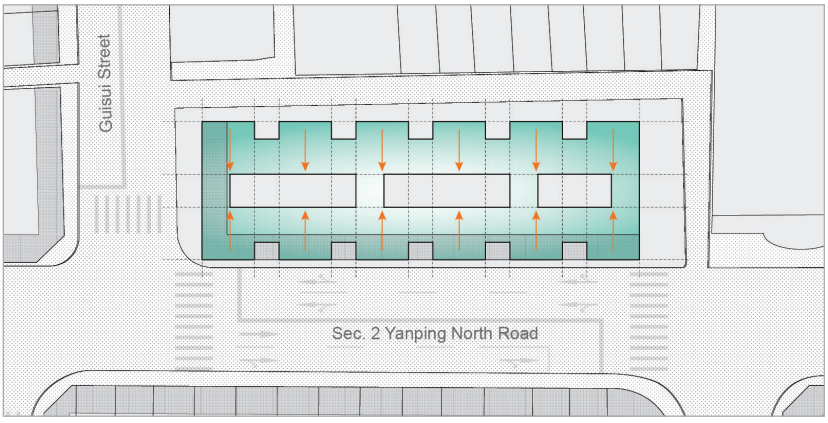


Fig. 5.116 The second design option introduces a new system for assembling dwellings bidirectionally and internalizes the public realm into its courtyards.

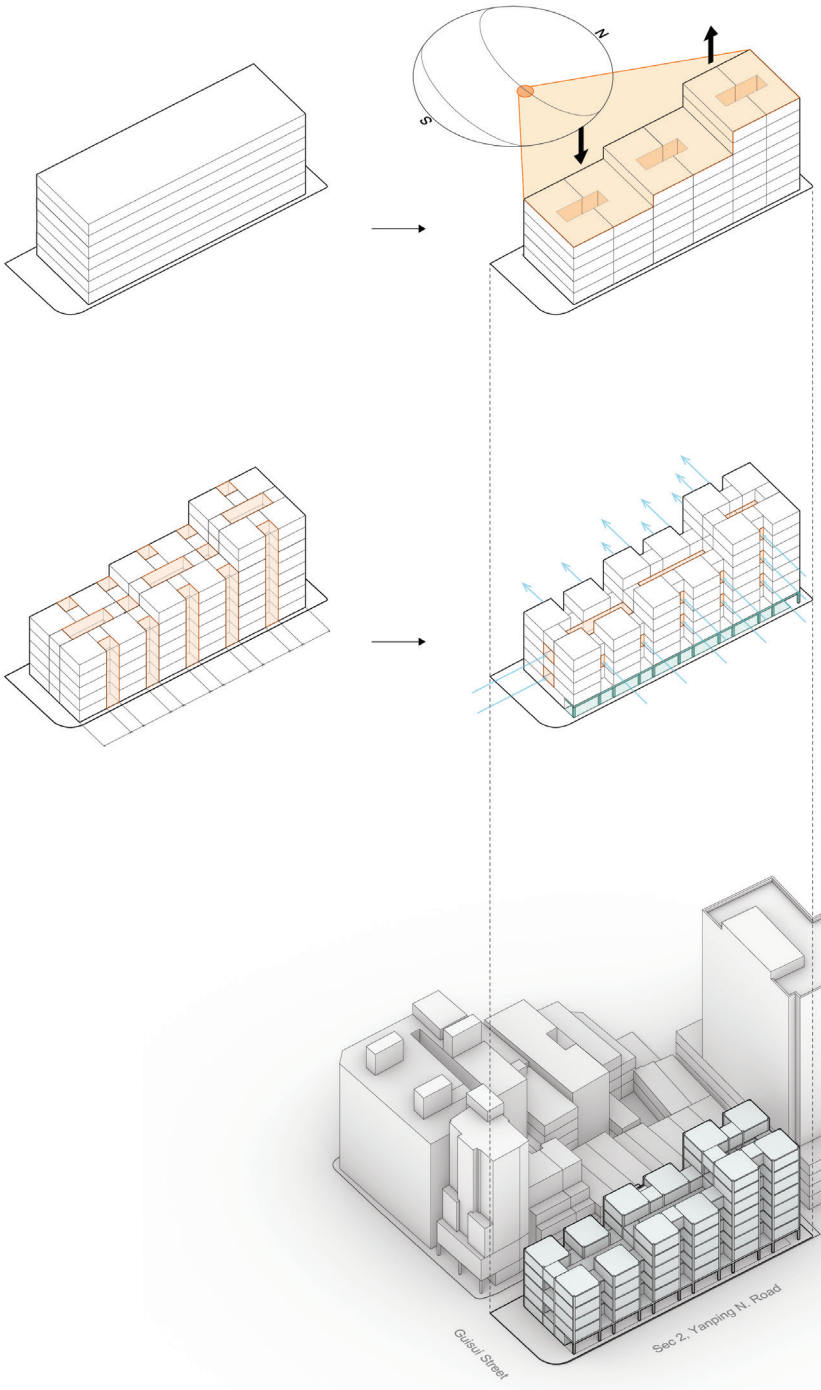


Fig. 5.117 By stacking the courtyard units in alternating directions it creates a series of open voids that allow for increased ambient light and cross ventilation.

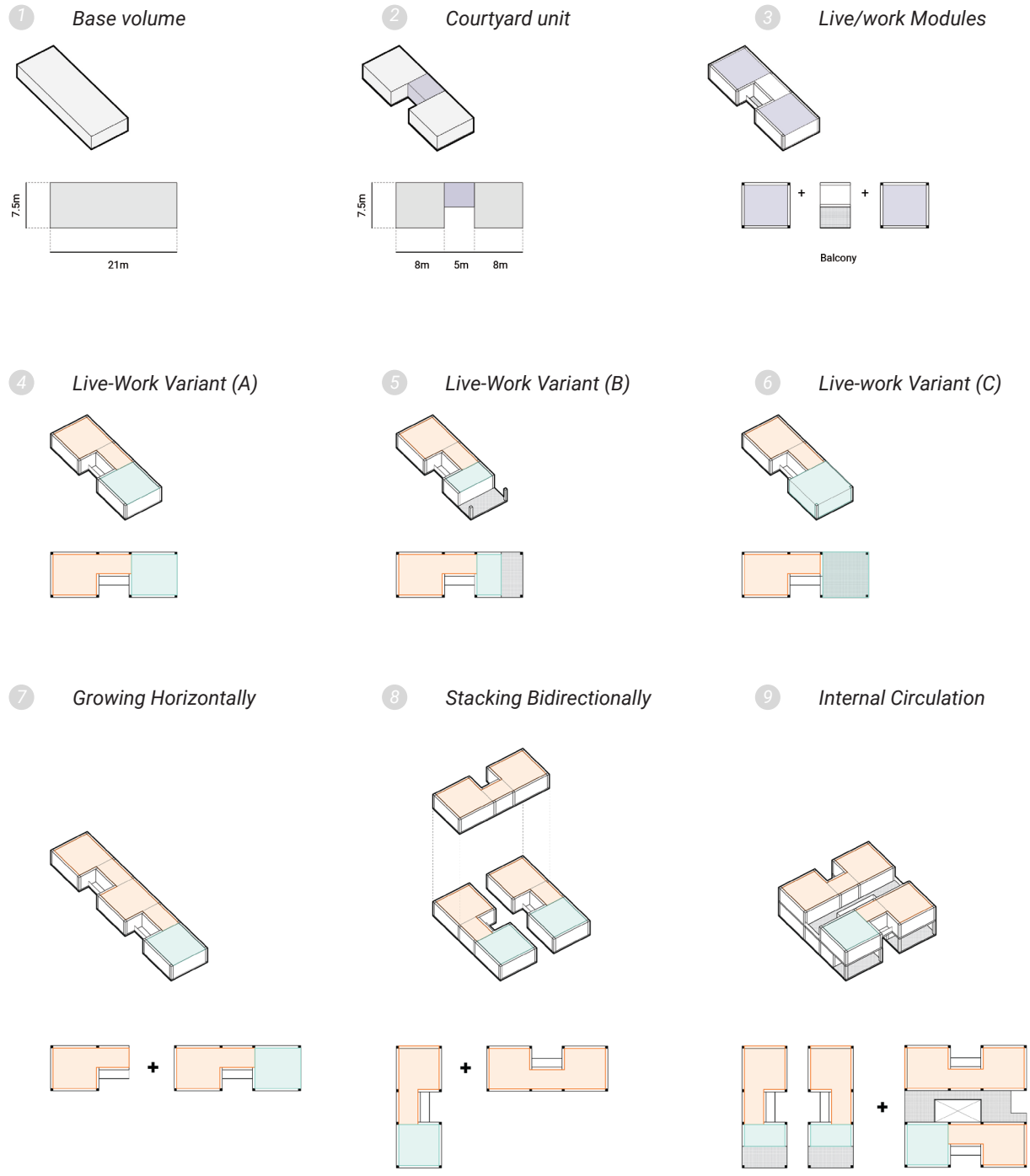
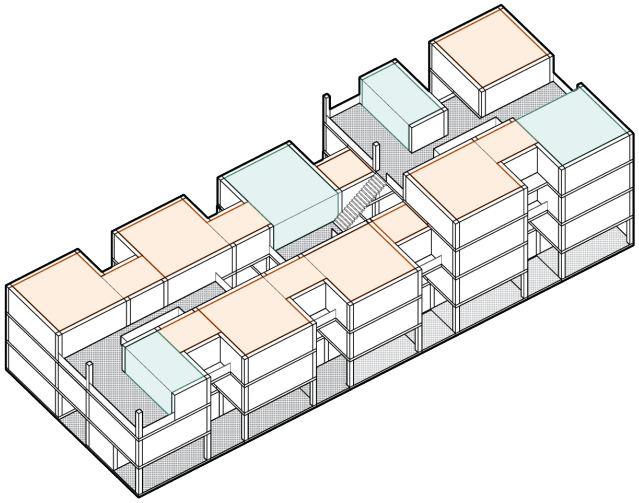


Fig. 5.118 Courtyard segments of each dwelling are oriented along the perimeter of the building. These spaces can be customized with balconies and infilled by the residents.



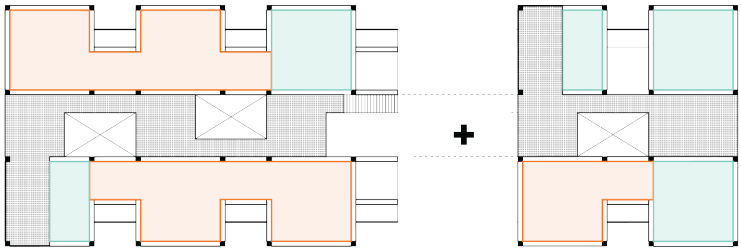


Fig. 5.119 The circulation path within the internal courtyard allows visitors to meander through a series of atriums, while experiencing commercial spaces on two sides.

Fig. 5.120 The facade of the the second design option can be infilled with shading devices and adaptations made on the balconies.

Fig. 5.121 A network of stairs, corridors and platforms work together to join the interior courtyard with the public realm.

Design Option 3

The final iteration develops from the previous designs by establishing a circulation network that weaves together a hierarchy of spatial realms that can be experienced as one travels vertically through the building. Three types of levels have been designed to create different gradients of experiences depending on the degree of access to sunlight, privacy, and the public realm. The “upper levels”, that start from the fifth level, provide residents and businesses with a high degree privacy and access to sunlight as a result of the large atrium opening. These spaces are joined together by corridors on every other level and two central stairs that span the entire length of the building. The “platform levels”, located on the second to fourth levels, join together the dwellings through platforms where commercial and residential activities can expand. The platforms are extensions of the ground plane that can be infilled with furniture, shop displays, and seating during designated shopping hours. The platforms are punctured by a series of courtyards that funnel natural light into its structure and create visual connections between each level. The “ground level” is composed of a series of courtyard units that are oriented towards Yanping North Road. The *ding-a-ka* and the spaces between the units provide additional outdoor seating and green spaces for the shops.

This final design iteration will present a catalogue of parts designed for infilling the supports-structure. A series of prefabricated panel modules are used to assemble the exterior walls of the residential and commercial units. The panels can be assembled together with various types of windows, doors, and facade additions. They can also be finished with different types of ceramic tiles and steel panels. The interior partitions of the residential units are made of a shelving system that is able to enclose and separate interior spaces. Residents will be able to easily adapt individual rooms through the assembly of these shelves, while using them for the storage of household items and furniture. Commercial spaces can be converted into open-air or enclosed shops through the use of glazed exterior wall assemblies. Open-air shops, such as small-scale restaurants, are created through a lightweight steel framework with movable wall panels. The basic commercial and residential units presented here reveal the variety of configurations that can be customized to generate different work-live scenarios. Each component that is added into the supports-structure is a form of insertions that can be plugged in and out of the building depending on needs or preferences.

In this new type, architects, builders, and residents will work together to continually transform and evolve the building. After its initial implementation, different generations of households and businesses will continually disassemble, re-assemble, and self-organize within the supports-structure. New catalogues and building technologies will emerge and transform the overall character of the building. Socio-political changes will cause the gradients of activities to shift and create new spatial realms. Through this flexible framework, it allows for existing social behaviours and cultural understandings to emerge and evolve with the type.

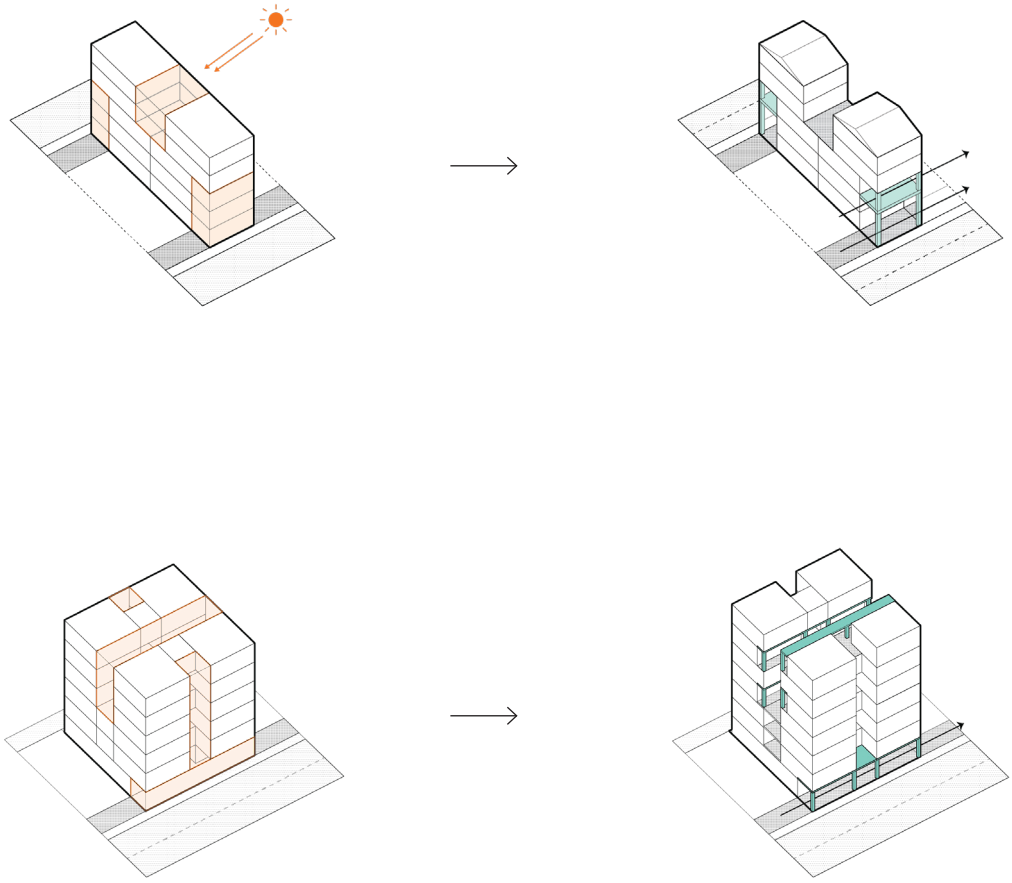


Fig. 5.122 Design Option 3 Strategy: Weaving the public circulation through a series of public terraces and corridors that extend through a central atrium

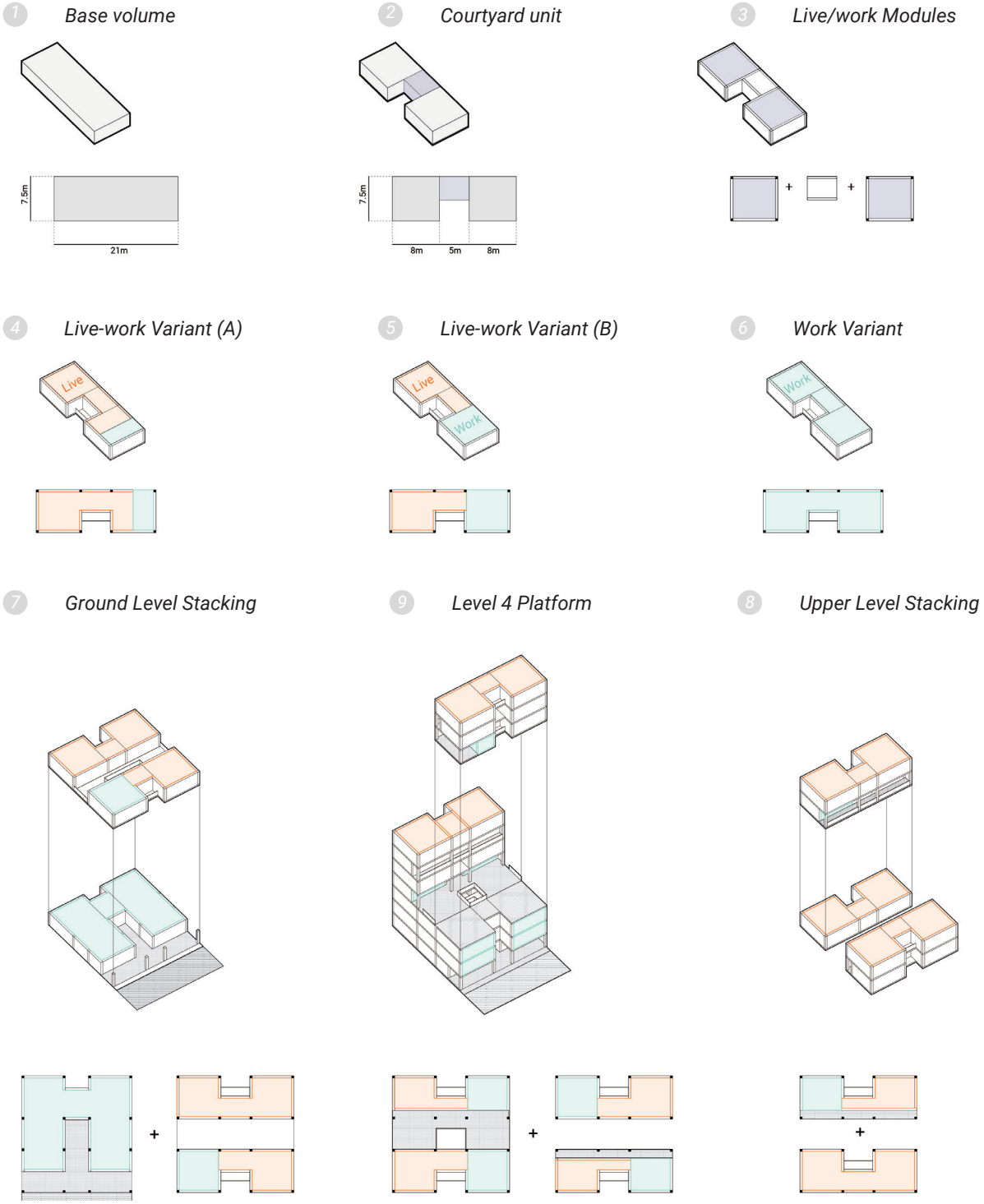


Fig. 5.123 The work-live units in the third design option are assembled within the supports-structure to create three different gradients of experience.

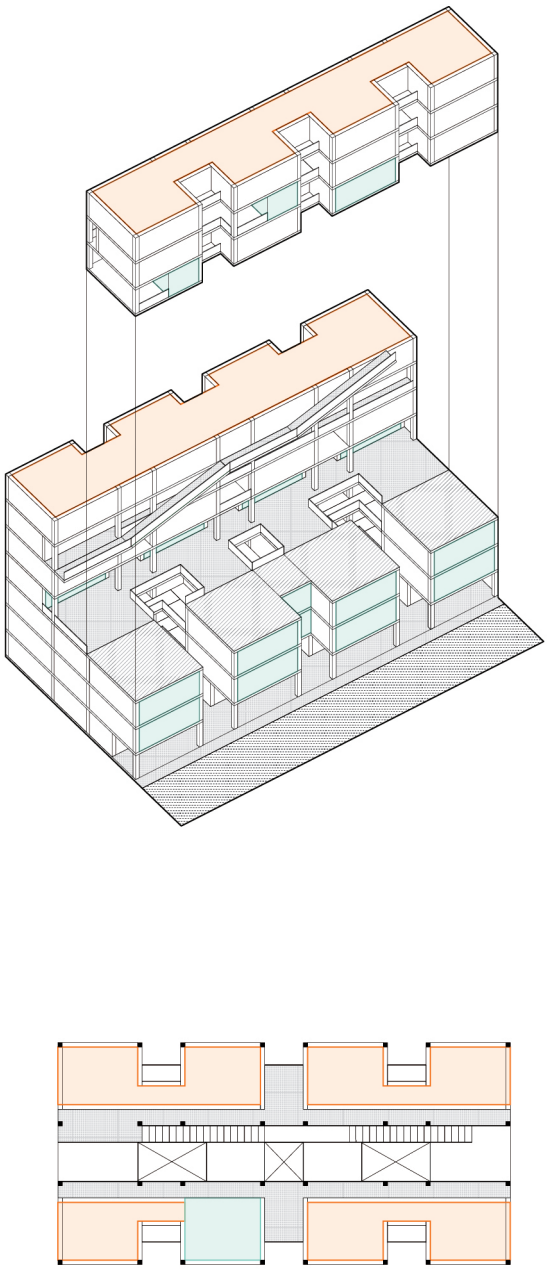
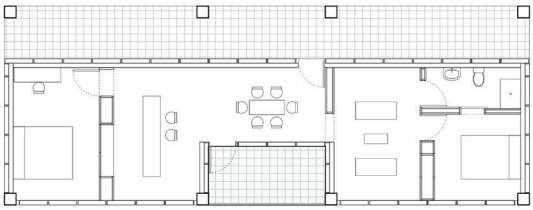
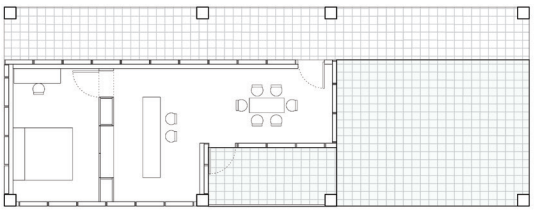
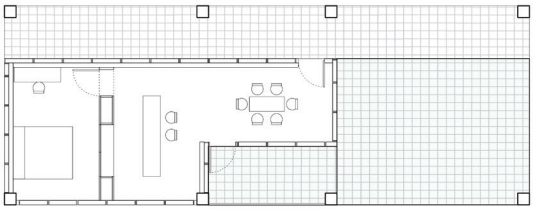


Fig. 5.124 The support-structure of the third design option creates a large atrium opening that starts from the fifth level. Doing so allows for more sunlight to penetrate the courtyard atriums located in the lower levels.

Fig. 5.125 The basic residential units shown here provide a variety of spaces that can be used for infill. These spaces can be used to insert commercial, office or studio spaces.





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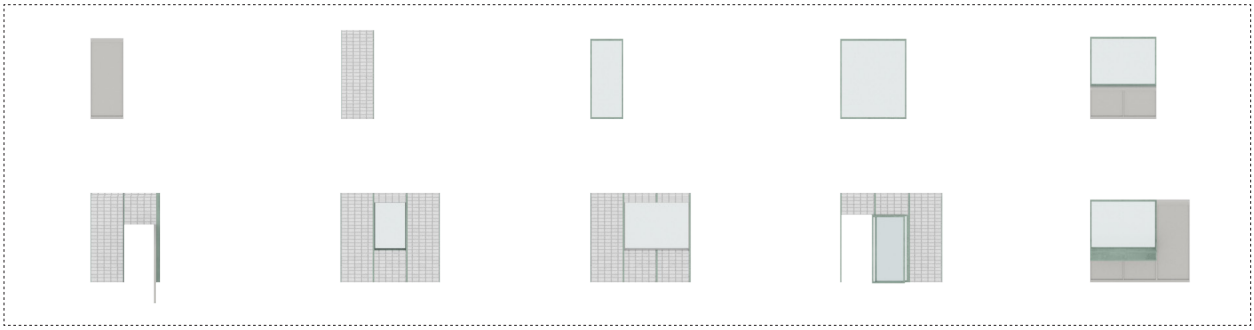
2m

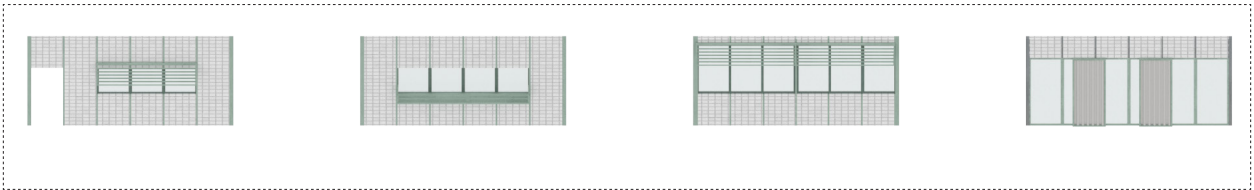
Panel Modules



Panel Assembly Variations

Street-facing Facade Types

Courtyard Facade Types



Large Insertions

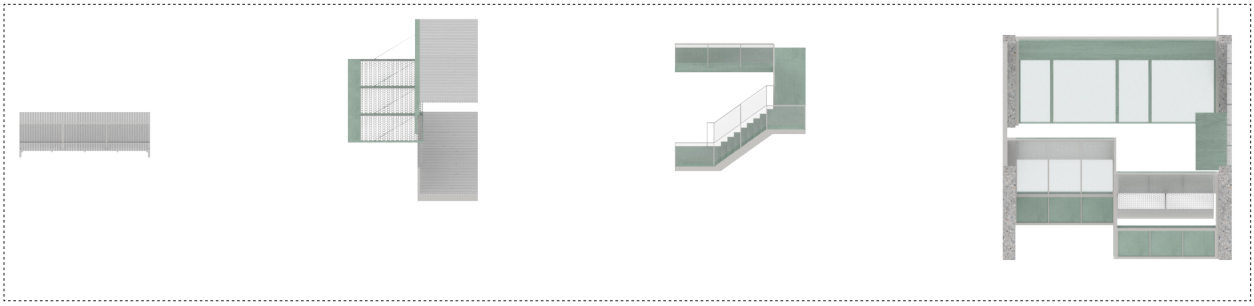


Fig. 5.126 The catalogue of parts that can be used create and customize residential and commercial units.

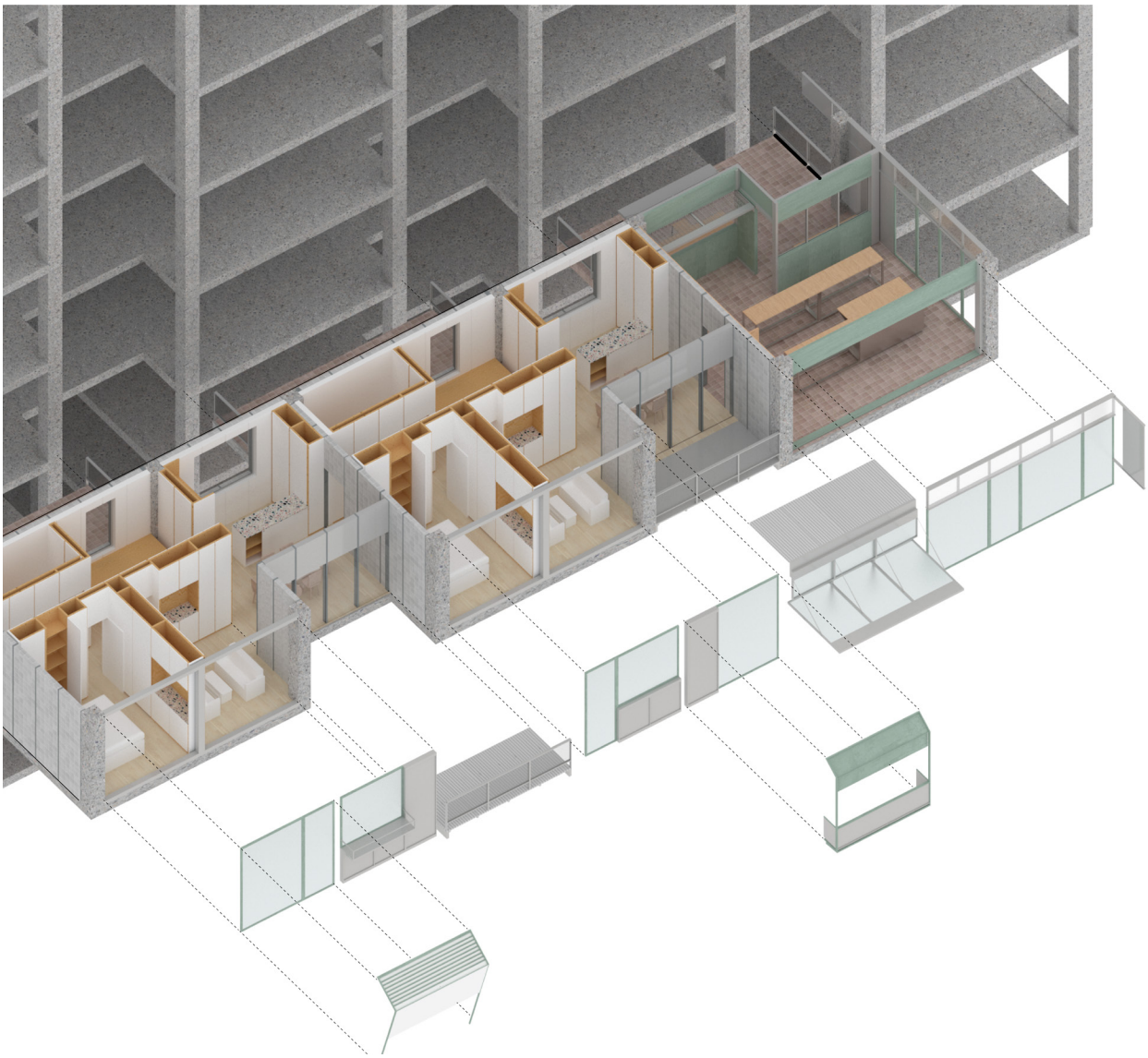


Fig. 5.127 Exploded view showing the different panel assemblies that can be used to construct the street-facing facade of the courtyard units.

Fig. 5.128 Exploded diagram showing how the panel modules can be used to construct the courtyard facing facade of the dwelling units.

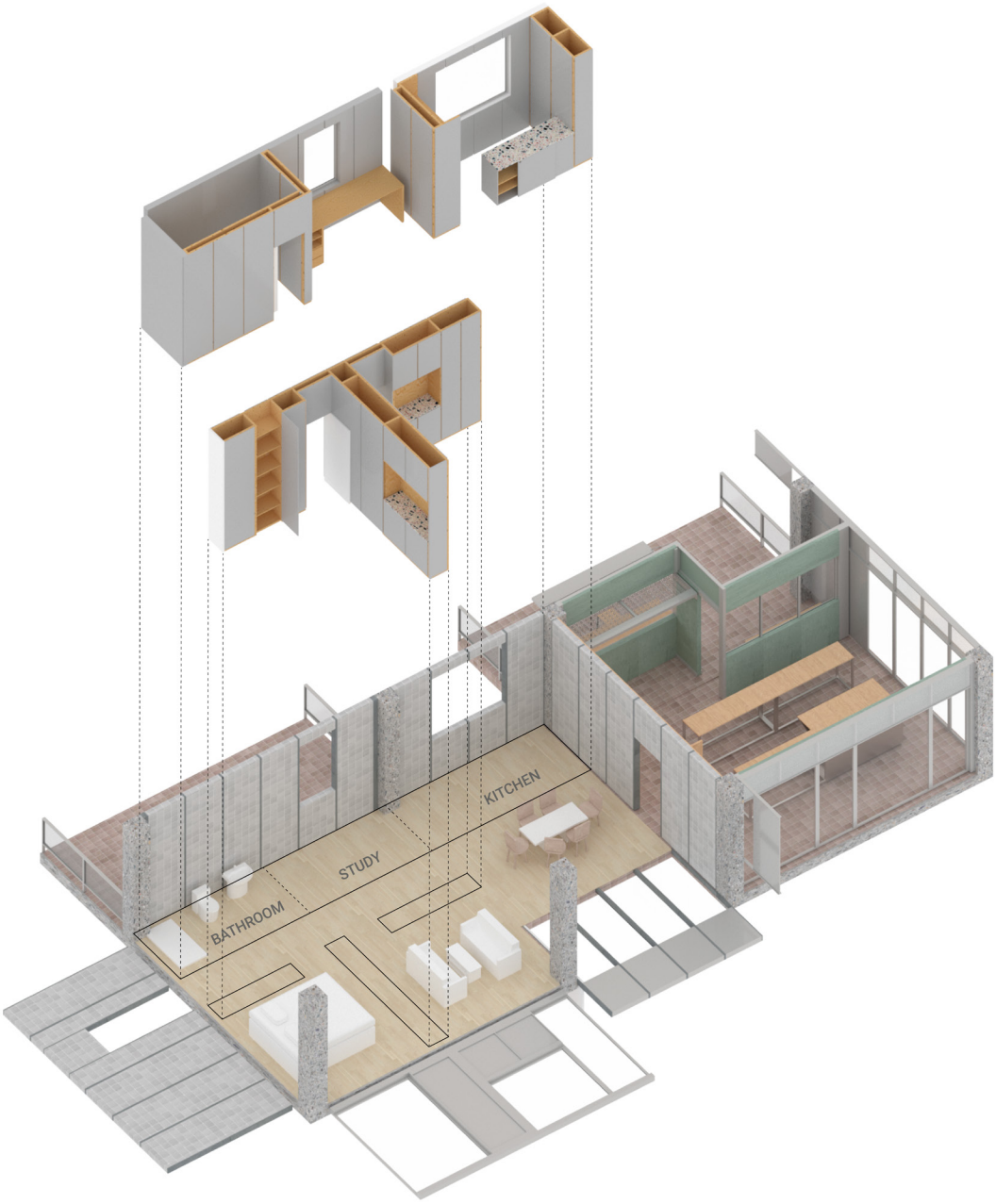


Fig. 5.129 Exploded diagram of the interior partition system made of shelves that enclose and separate interior spaces. The shelves and cabinets can be customized to provide space for storage and display.

Fig. 5.130 An open-air shop storefront is shown here with portable kitchen furniture that can be deployed during shop hours.

Fig. 5.131 An enclosed shop storefront is shown here with a variety of outdoor furniture pieces that visitors can interact with.

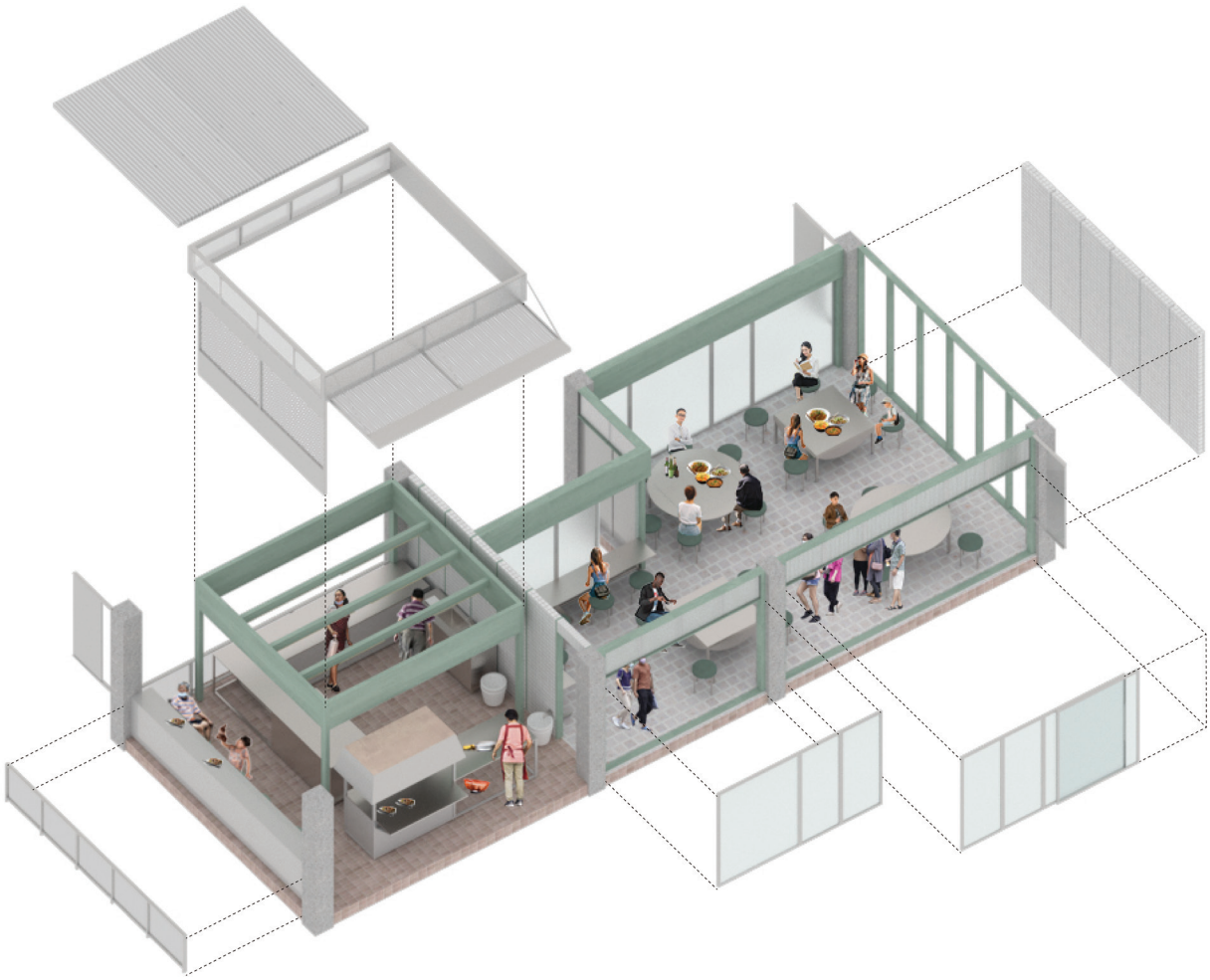


Fig. 5.132 Exploded view of an open-air shop showing the customizable panels and structural framework that can be modified depending on the commercial activity.

Fig. 5.133 The second level provides a direct connection to the public realm through a series of public stairs and elevators.

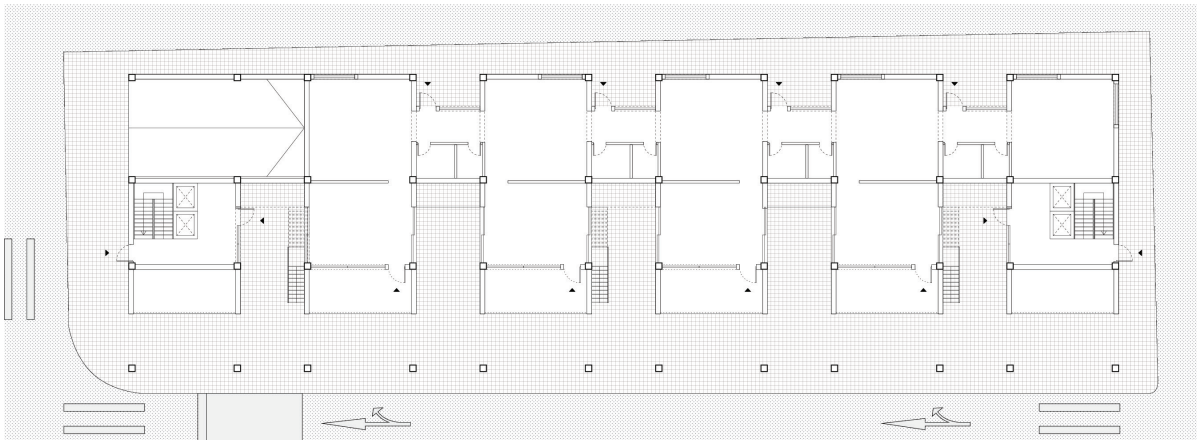


Fig. 5.134 Level 1 Floor Plan

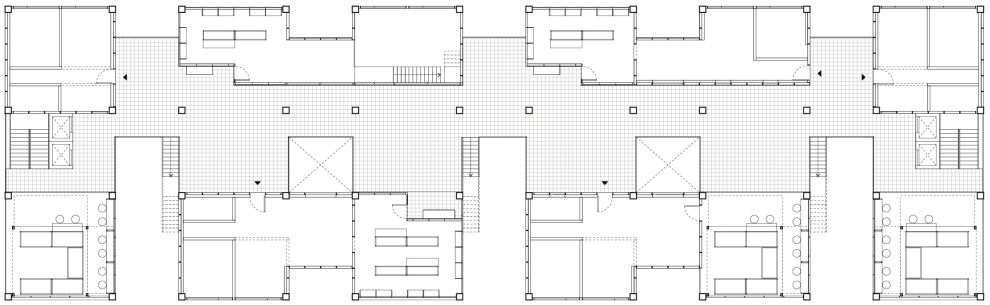


Fig. 5.135 Level 2 Floor Plan

Fig. 5.136 The commercial spaces on the fourth level can expand their activities from the shops to the corridors and terraces to create spaces for seating and gathering.

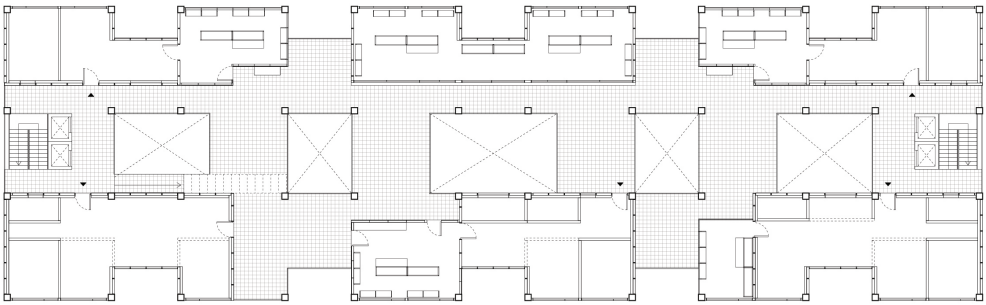


Fig. 5.137 Level 4 Floor Plan

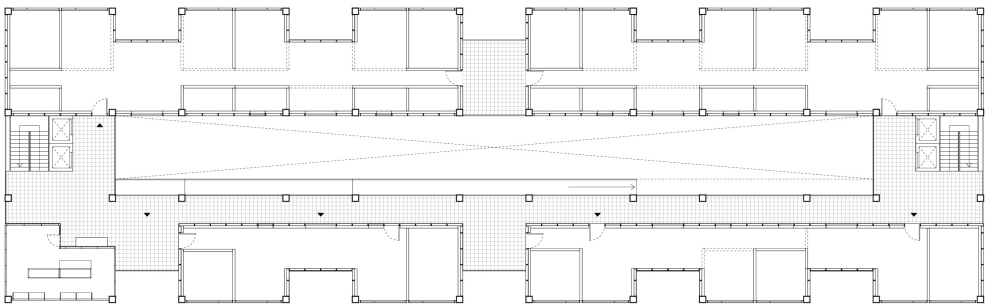


Fig. 5.138 Level 5 Floor Plan

Fig. 5.139 The facade reveals the variety of different unit combinations and commercial spaces that have been inserted into the supports structure.

Fig. 5.140 The internal courtyard expresses the different combinations of window types, finishes, and facade additions used by businesses and households to customize their units.

Fig. 5.141 This cross section reveals the distinct spatial realms that are created through the supports structure and the variety of different facade insertions residents can use to expand their living spaces.


明仁蔘藥行
組藝埕
萬福餡餅
越美足體養生館
勝芳紙行

Conclusion

Our cities today have been formed through a time-sensitive evolutionary process where the urban form and society together reflect the distinctiveness of a place and cultural identity. Emerging Asian cities such as Taipei, reveal a remarkable urban fabric that has been continuously revised and transformed through incremental periods of colonization and political changes. This sense of continuity is reflected through architectural typologies, such as the streethouse, that have evolved with society as a scaffold that supports urban life and social activities. However, the current unprecedented pace and scale of urban redevelopment threaten this enduring typological process by introducing new forms of architecture produced by modern capitalism. Globalized types, such as multi-story condominiums and gated communities, that are culturally detached from the existing urban fabric have begun to re-organize society within its programmatically rigid structures. Such types seek to displace local spatial dynamics and have led to a weakened sense of identity.

As a response to this contemporary crisis of type, this thesis proposes a research and design methodology that allows designers to work typologically to generate new architectural frameworks that can reinforce and strengthen existing socio-cultural and spatial dynamics that reflect a distinctive urban context. The newly proposed type is a collective housing model that can co-evolve with its residents through its flexible framework. This new type encourages residents to participate in the making of their own homes while providing a system for future adaptation. Through this co-evolution, socio-spatial relationships can form a bond with the type and develop concurrently to reflect cultural understandings linked to a specific locale. The streethouse and its historic variants have served as precedents of highly adaptable frameworks that allow its residents to self-organize within its structuring system. Emergent housing types built in the 1960s reveal strategies that architects have taken to develop and re-arrange these formal structures to create new spatial relationships. This new type works within this typological process to produce frameworks that reflect the present socio-economic pressures for densification and mass housing.

This housing model, however, raises questions about the roles of the architects and residents in this co-design process. Architects of this new type are responsible for creating a supports-system to organize public functions, amenities, and circulation. They are tasked to design the overall framework and the system of how residents will participate. Architects dictate the flexibility of the type through a set of rules for the system that ensures public safety, building

code requirements, and fairness between the residents. The rules are essential for the type as it has been shown in Taipei that when adaptations become unsafe and overgrown, they can create unsanitary and dangerous environments. The traditional role of the architect will drastically change in this process, as the architects will no longer be the sole authors of a building but will have to work with residents to develop each dwelling individually. This will extend project timelines, however, also provide architects the opportunity to continually work on the building as the residents may require modifications in the future.

Residents can work alongside architects to pick and choose their desired wall types, finishes, and interior layout. They can customize their home through a set of options provided by the architect and the manufacturers of these prefabricated parts. It is entirely possible and expected that some residents may not be interested in designing their homes and will ask the architects to do it for them. Therefore, the willingness of a resident to participate will influence this design process. After the individual dwellings are constructed, the residents will be free to modify their homes or businesses. They can order new parts, make adaptations by themselves, or hire builders to complete the jobs for them. The manufacturers of the prefabricated assemblies will regularly update their products, giving residents new catalogues every year. The residents must report their modifications to a building administrator to ensure that the adaptations are done safely, and the necessary precautions are taken. Large modifications, such as wall assembly replacements or shop construction require the support of a builder and architect due to the structural risks involved. Small modifications such as window replacements, façade addition, or changing of interior partitions can be done by the residents independently. Through these supervised modifications, residents can safely transform their homes and the streetscape through their daily spatial practices.

This thesis explores the existing typological dialogue created between the implementation of a type by an architect and the continued transformation by its users. Architects interpret the socio-economic needs of society through their designs, whereas local residents in turn re-shape buildings through their everyday activities, behaviors, and preferences. Architects are capable of controlling the degree of type flexibility to allow for greater user participation through future adaptations. By working with this dialogue, future buildings can become evolving armatures for self-expression that reinforce existing cultural understandings and spatial dynamics.

References

Chen, Fei, and Kevin Thwaites. *Chinese urban design: The typomorphological approach.* Routledge, 2018: 49.

Corbusier, Le. *Towards a new architecture*. Courier Corporation, 2013.

De Quincy, Quatremère, and Antoine Chrysostome Quatremère de Quincy. *The true, the fictive, and the real: the historical dictionary of architecture of Quatremere de Quincy.* Papadakis Publisher, 1999.

Gold, Thomas B. *State and society in the Taiwan miracle*. Routledge, 2015: 3.

Habraken, N. J. *Supports: An Alternative to Mass Housing.* The Architectural Press, London, 1972: 18.

Hsieh, Chun-Ling and Hetherington, William. "Bureau draws attention to elderly living alone". The Taipei Times. 2021.

Jacobs, J. Bruce. "Taiwan's colonial history and postcolonial nationalism." *In The "One China" Dilemma*. Palgrave Macmillan, 2008: 38.

Jacoby, Neil Herman. *Evaluation of US economic aid to free China, 1951-1965*. Department of State, Agency for International Development, Bureau for the Far East, 1966.

Jr-Gang, ed. *Heterogeneous Taipei: Post-60 Mid-low Rise Housing Renovation Makes the City*. Garden City Publishers, 2013: 29-40.

Knapp, Ronald G. "Chinese Frontier Settlement in Taiwan." A*nnals of the Association of American Geographers 66, no. 1*, 1976: 43–59.

Lathouri, Marina. “The city as a project: types, typical objects and typologies.” *Architectural Design 81, no. 1* (2011): 24-31.

Lin, Jin-Ann and Liang-Chuan Chen. “The Modern Vernacular Reassessed: The Socioarchitectural Origin of the Taipei Walkup Apartments.” *Journal of Urban History 41, no. 5*, 2015: 909.

Moneo, Raphael. “Oppositions, on Typology.” *A Journal of Ideas and Criticism in Architecture* # 13: 24.

Pitkänen, Ari-Joonas. “Wild Cities: The Renegade Roots of Urban Taiwan.” *Cross-Currents: East Asian History and Culture Review*, no. 33, 2019: 242.

Tien, Hung-Mao and Chyuan-Jeng Shiau. “Taiwan’s Democratization: A Summary.” *World Affairs 155*, no. 2, 1992: 59.

Tsukamoto, Yoshiharu. “Commonalities in Architecture.” Bracket 4: Takes Action (2020): 102-109.

Vidler, Anthony. “The Third Typology.” *Oppositions Reader*. 1998: 15.

Richard C. Kagan. Martial law in Taiwan, *Bulletin of Concerned Asian Scholars*, 1982: 50.

Rossi, Aldo. *The Architecture of the City*. The MIT Press, 1984: 39-41.