

SHANGHAI METABOLISM

Adapting aging Danwei housing compounds

**Yilun Hong
May 2020**

**Carnegie Mellon University
Master of Urban Design Thesis, 2018~2020**

**Advised by:
Jonathan Kline
Stefan Gruber**

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ABSTRACT

Housing in China has evolved along with its political and economic system since the establishment of the country in 1949. From the state-owned and centralized planned economy in the early stage to today's socialist market economy, housing from each era has left legacies on the city. Among them, the object of this thesis, the old Danwei Housing, constitutes a large proportion. Massively constructed and distributed to workers by the state and state-owned enterprise in the socialist era, Danwei housing was privatized and commodified during the economy reform era, and today amounts to 40% of Shanghai's housing stock and 30% of its real estate market.

Danwei housing today is situated in a difficult position. On the one hand, after decades' development, the Danwei compounds that used to locate on the fringe of the city have grown into vibrant neighborhoods with abundant public amenities, and some become city-wide destinations. Also, with the aggressive boom of the real estate market and escalating housing costs, Danwei housing has become a primary source for affordable housing. On the other hand, the Danwei housing buildings, mostly built with brick and precast slabs and equipped with the most basic facilities, are failing to meet residents' need with its aging infrastructure. Furthermore, the gap between Danwei workers, Shanghai native, and immigrants is exposing social issues within the community.

The governance and regeneration of Danwei housing has been the government's concern since the housing reform that removed Danwei from its administrative system. In the past 20 years, the government has led several projects to improve Danwei housing, such as "Pinggaipo" project and some facade beautifying projects. However, these top-down physical-level projects are seldom appreciated by the residents, but sometimes result in even more complaints and dependence on the government. Thus, in recent

years, the state is proposing a new "Social Governance Model Based on Collaboration, Participation, and Common Interests", promoting public engagement strategies, and also set forth plans for Danwei housing renovation nationwide, with an estimation of 170,000 Danwei compounds to be renovated, involving over 100 million residents.

In the non-governmental realm, architects and sociologists are coming forward with different strategies to improve Danwei housing from the bottom-up. Unlike governmental projects, these organizations (e.g. Big Fish Community Development) investigate social issues, and build interventions on top of the solidarity of residents. Their practice demonstrates the possibility of bridging social gaps and bringing different people together for community improvement in the Chinese context. Thus, it's reasonable to envision a future for resident-initiated transformations leading to more inclusive and just communities.

This thesis reviews the history of Danwei housing in different eras and current Danwei housing governance and regeneration models, and envisions a new era of Danwei housing where residents are empowered to improve their own living environment and forge new connections between social groups. Drawing inspiration from several international precedents and theory of commoning, this thesis proposes (this will ultimately need to be more specific) new processes of (design decision making, shared space management....) and physical improvements at a variety of scales.



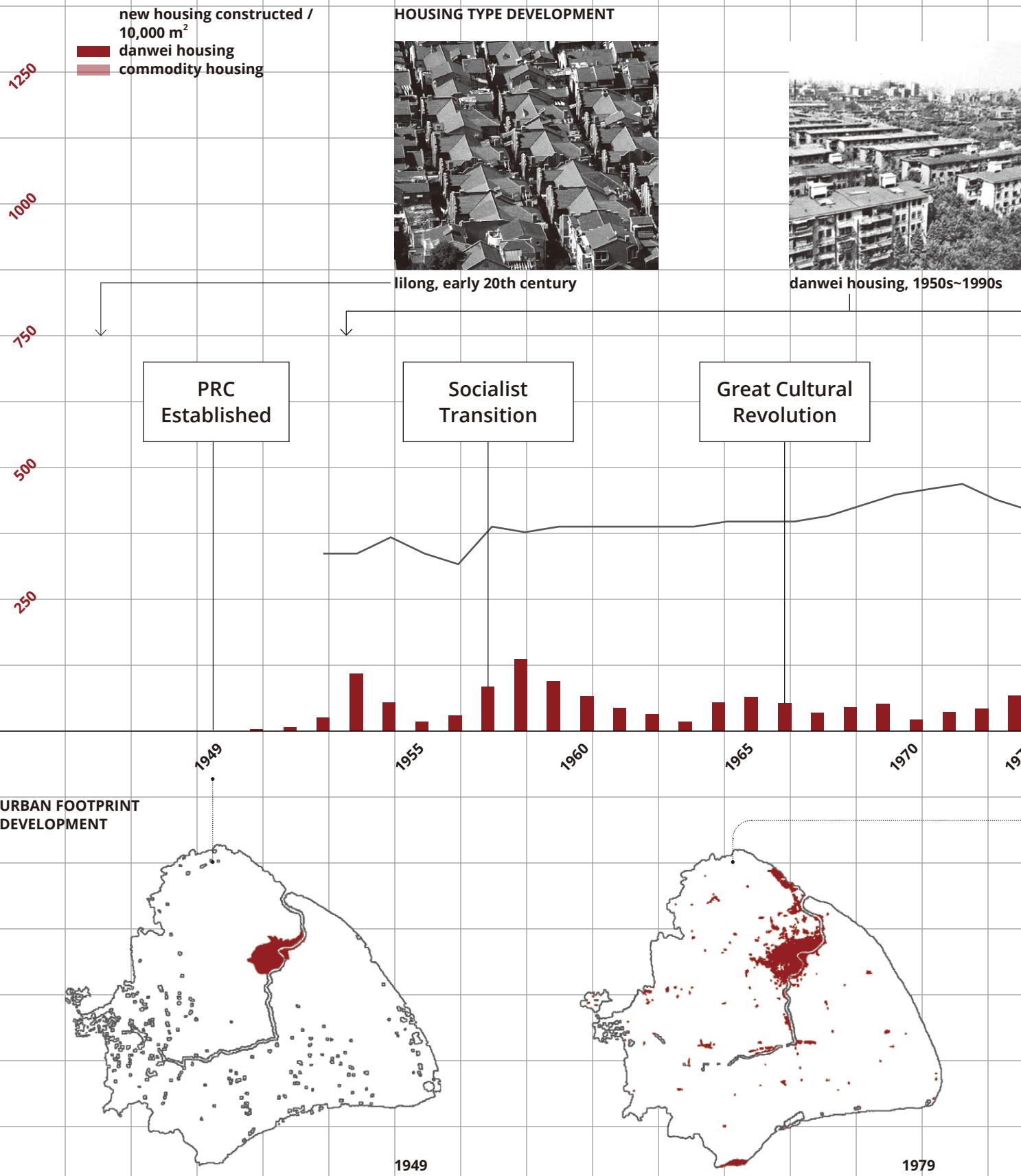
CONTENT

ACKNOWLEDGEMENT



01

HISTORIC REVIEW





commodity housing, 2000

Housing Reform,
Measures of
Shanghai on
Transaction of
Danwei Housing
Issued

average living space
per capita
/m²

12.5

10

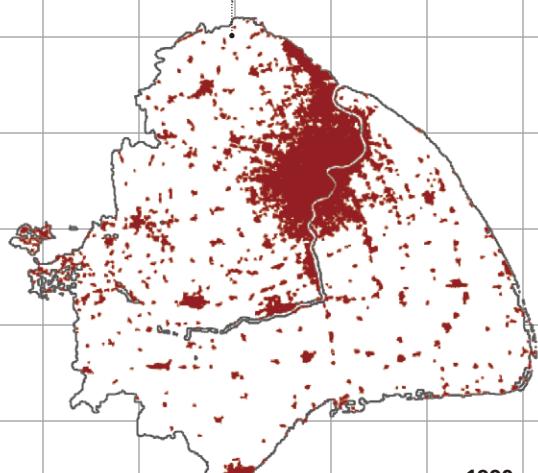
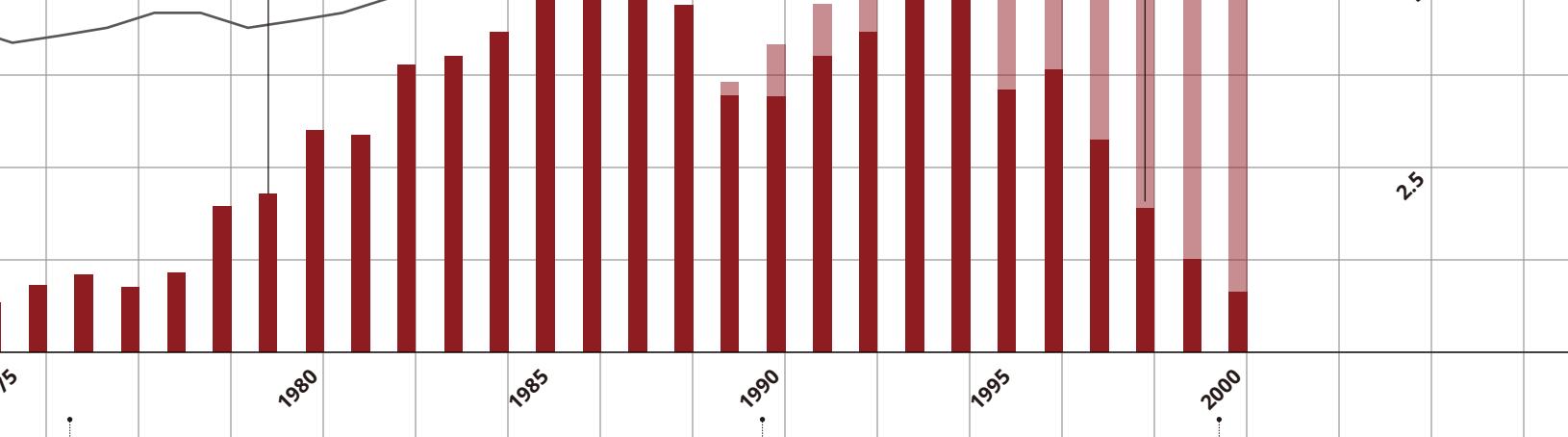
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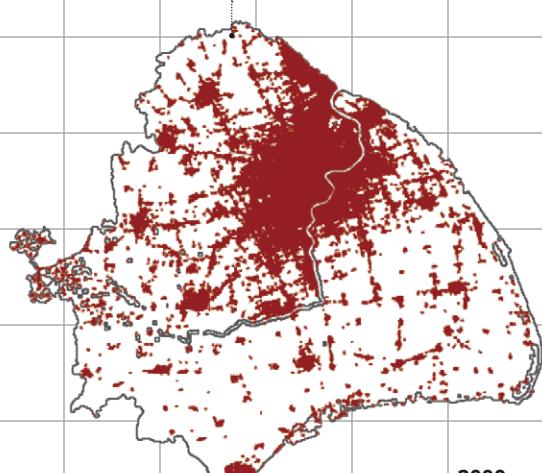
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Danwei Housing
Distribution Policy
Abandoned

Economy
Reform and
Opening-up



1990



2000

THE ORIGIN

Shanghai is located on the eastern coast of China, next to the estuary of the Yangtze River. Though being one of Asian's major financial centers, Shanghai was originally an agricultural village, and was forced to be established as a treaty port after the Opium War in 1843, in accordance with the Nanjing Treaty. The treaty brought in merchants from western countries including Britain, France, and the USA, who carved up the city and built their concessions separately. The city reached its economic glory in the 1930s, when it became known as "The Paris of the East", while its social inequity also polarized. On the other side of the feasts and luxury on the bund, were most workers' wretched existence in the overcrowded rental housing or slum.

Upon the Liberation of Shanghai and establishment of PRC in 1949, the government and Chinese people were faced with a city with fragmental infrastructure and unbalanced industries. According to the Soviet consulting team's position paper on Shanghai reconstruction and development, Shanghai was an abnormally developed and indulgent consumer city, and in line with socialism principles, the city should be reformed into a worker class predominant and prospering industrial city. Thus, with the principle of "serving for production activity and working people, and giving first priority to the worker class", Shanghai government started the construction of public housing, which is also known as Danwei Housing.



THE PARADIGM

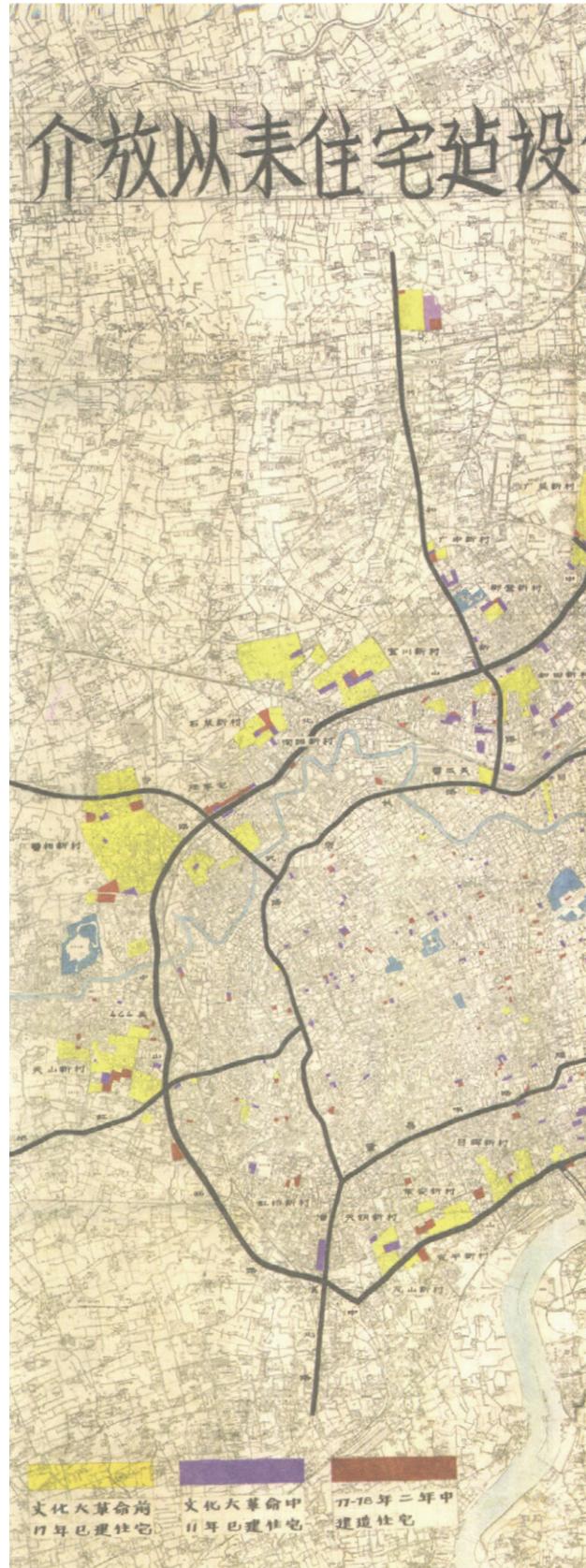
In 1951, the construction of Caoyang New Village started in a rural farmland in the northwest of Shanghai, near Putuo industrial district. Led by the architect Dingzeng Wang, who gained his Master of Architecture degree from University of Illinois at Urbana-Champaign, the master plan of the new village integrated Soviet planning theories (superblock), Perry's Neighborhood Unit model, and Mao's New Village model. The 94.63-hectare new village with a radius of 8-minute walking distance, was surrounded by artery streets connecting to the city and had an internal street network. In the periphery of the superblock were the cooperative grocery and general stores, and in the center were public facilities such as canteen, schools, and workshops. This layout offered the residents easy access to daily essentials and work, as well as embedded the socialist politics and collectivism living into the spatial form.

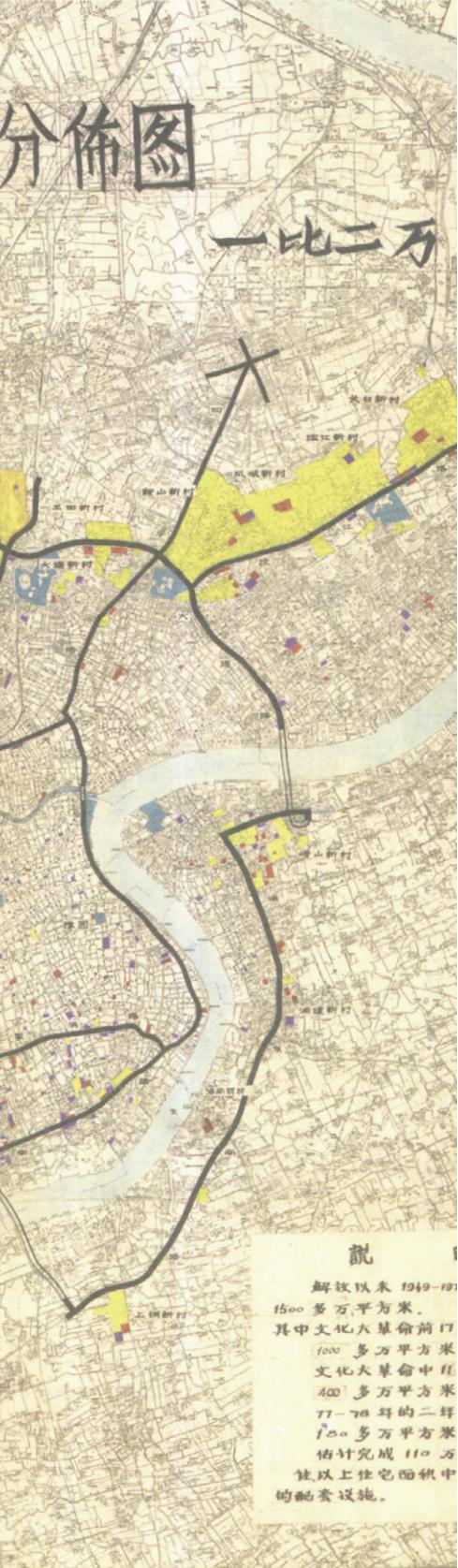
Caoyang New Village was the first government-led residential compound project in Shanghai since the establishment of PRC, and was designated to be the paradigm of the later public housing projects in the city. In a reflective essay by Wang in 1956, he revisited Soviet communist planning theories, and pointed out Caoyang New Village's deficiency of being uneconomic for its low density (all residential buildings were 2-storey) and far distance from the city center. In light of this type of comments and Soviet concept of "microdistrict" emerging in China, the principles of residential compound design were formed and proposed by the authority building on the foundation of Caoyang New Village design: "Practical, economic, and aesthetical if possible"; "实用、经济、美观". A typical residential compound in line with such principles would cover a whole block, usually 300~400 meters in dimension, and filled with residential buildings linearly layed out. Public facilities such as kindergartens activity rooms were located at the center of the compound, while commercial facilities and schools were located at the edge of the block next to the streets.



SHANGHAI URBANIZATION

With the compound model formed and corresponding administrative system established, Shanghai started its rapid urbanization. In the 1950s and the beginning of 1960s, as supporting projects of the industrial district development, XX resident districts were planned and constructed in the suburb and satellite cities. The development stagnated between the mid 1960s and 1970s due to the Great Cultural Revolution, and accelerated rapidly in the 1980s to solve the housing shortage. In the 1980s and 1990s, XX resident districts were built at the fringe of the city.





DANWEI SYSTEM & ADMINISTRATIVE SYSTEM

The physical form of Danwei Housing and Chinese administrative system are entwined and inseparable. After the establishment of PRC, CPC formed a socialist economic system based on public ownership, and its organizational structure is known as the Danwei System, through which the central government transmitted its strategies and policies to the basic level. For working individuals with urban Hukou, Danwei was the most crucial part of their life: they received from Danwei not only their salary, but also all kinds of social benefits, including housing, food supply, pensions, etc. Theoretically, Danwei employees would never lose their job, while everything in their and their dependants' life was confined by their Danwei, that they would even need Danwei documents to stay in a hotel. In a word, individuals "belong to" Danwei.

Danwei housing was a social benefit for working people and their dependants. They were planned and built by the government (before 1978), and distributed by each Danwei. Residents would pay very low rent to their Danwei, and the Danwei would take charge of the maintenance of the compound. Thus, the employees from the same Danwei usually stayed in the same compound near their workplace, where they lived next to each other, shared the same facilities, and went to work together, while their children went to the same school and played together. This added to the employees', or compound residents', self identification to the Danwei community.

The spatial hierarchy of Danwei housing also corresponded to the government's administrative hierarchy. According to Regulation on the Organization of Urban Neighborhood Office and Regulation on the Organization of Urban Residents' Committee, both released in 1954, the district government would establish a neighborhood office in each neighborhood (50,000~100,000 residents), and under the guidance and supervision of the neighborhood office, every

100~600 households would elect one residents' committee, which was in charge of the procedure of social welfare distribution and publicizing of propaganda. Spatial-wise, each residents' committee was responsible for one Danwei compound (or more than one in some cases), and each neighborhood office was responsible for one residential district, consisting of around 10~20 Danwei compounds. The public facility planning also followed the similar hierarchy. Commercial facilities were allocated in three levels: residential district level, residential microdistrict level (5~10 Danwei compounds), and compound level. Hospitals and combined middle and high schools were built for each residential district.

HOUSING REFORM

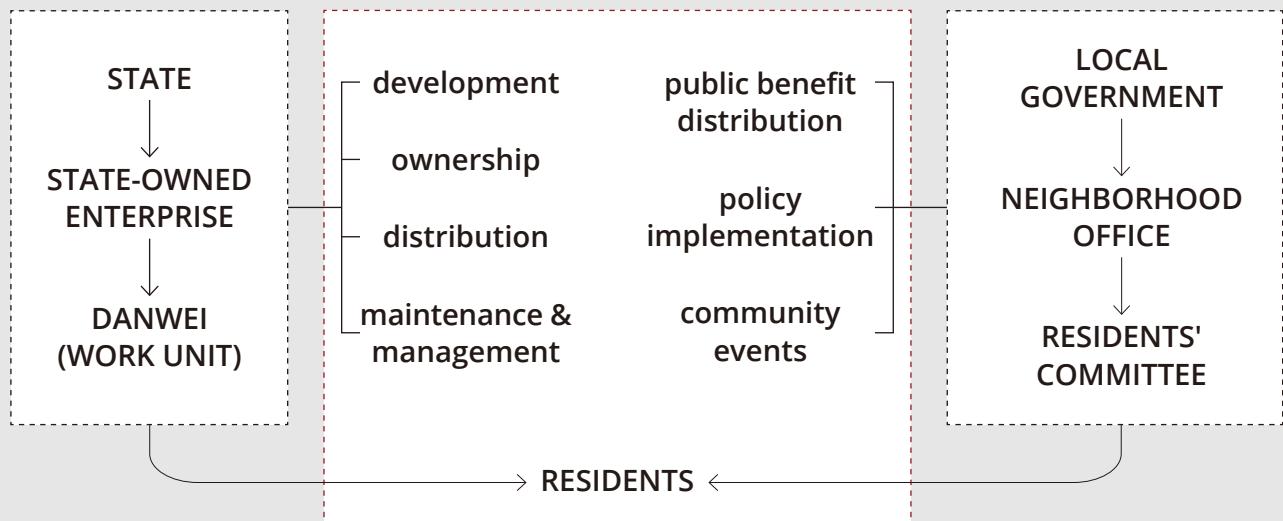
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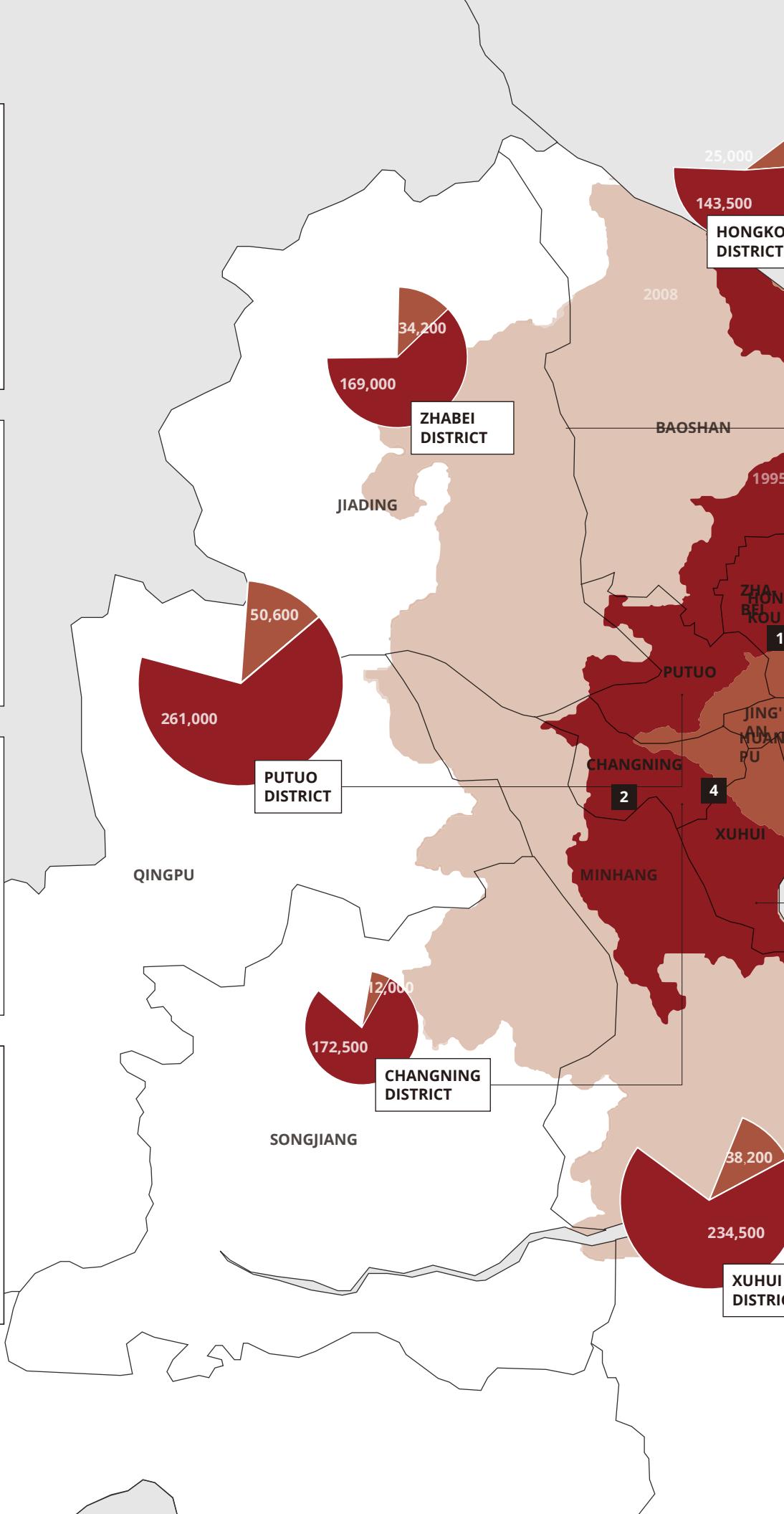
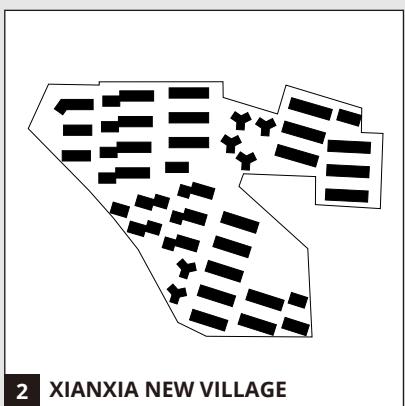
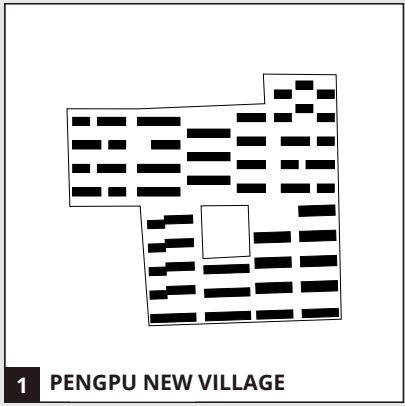
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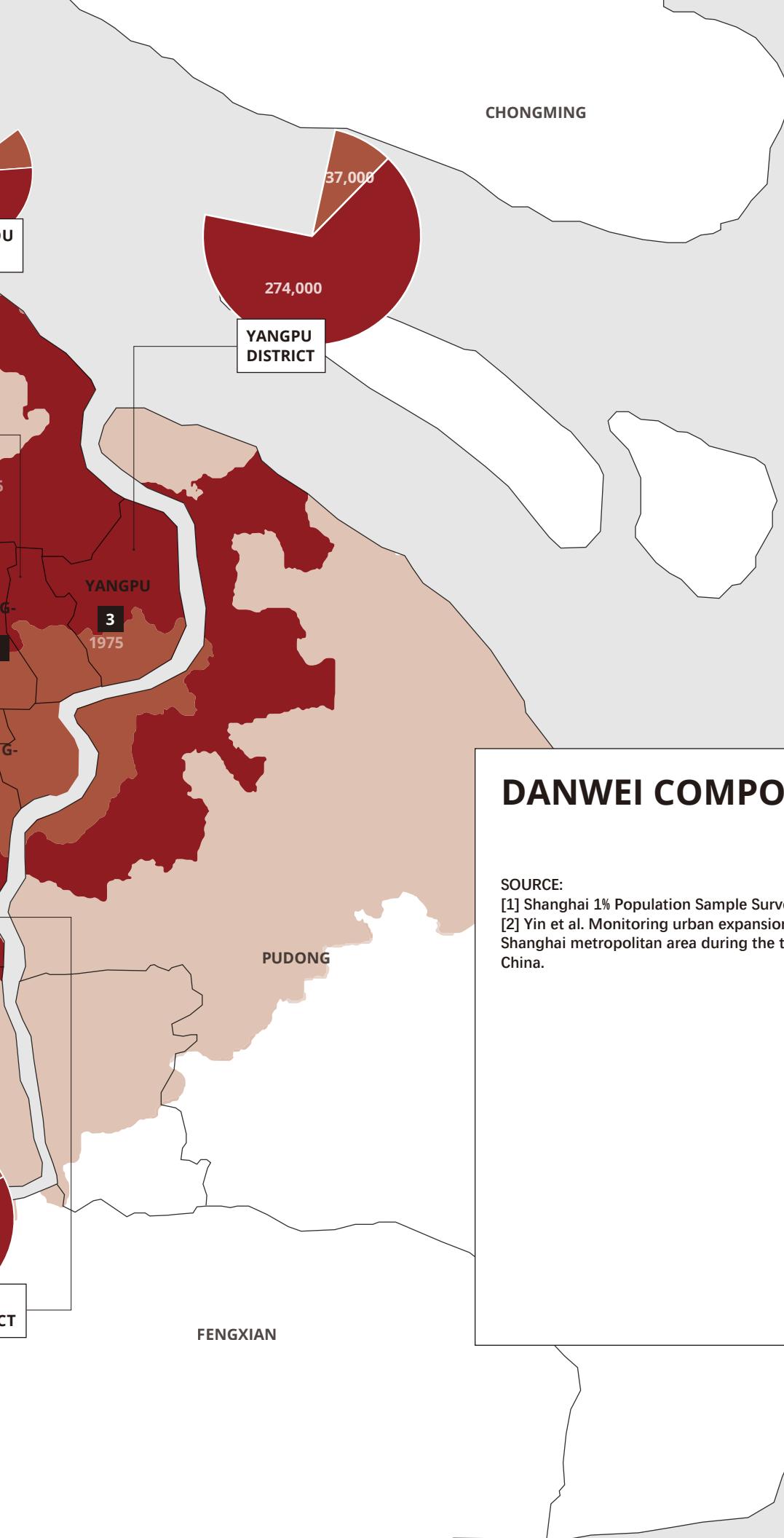
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DANWEI COMPOUNDS TODAY

SOURCE:

- [1] Shanghai 1% Population Sample Survey Data 2015
- [2] Yin et al. Monitoring urban expansion and land use/land cover changes of Shanghai metropolitan area during the transitional economy (1979–2009) in China.

Pengpu Residential District

EXAMPLE DANWEI COMPOUND (PENGXIN XIAOQU)

Year: 1984

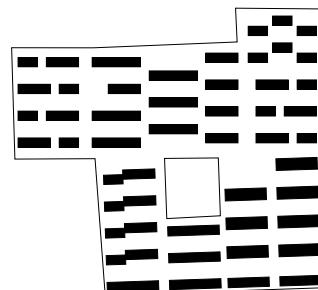
Average Price: 50,665 Yuan / sq.m. (672 US dollars / sq.ft.)

Condo Area: 41 sq.m.

FAR: 1.55

Area: 67,519 sq.m.

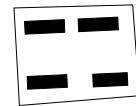
Household: 2,184



CONTRASTING HIGH-RISE APARTMENT (WENXI HUATING)

Year: 2016

Average Price: 85,067 Yuan / sq.m. (1,138 US dollars / sq.ft.)

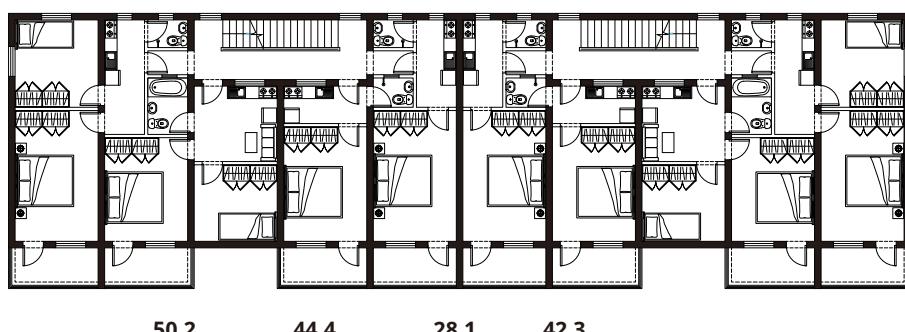


Condo Area: 135 sq.m.

FAR: 2.5

Area: 16,018 sq.m.

Household: 314





Xianxia Residential District

EXAMPLE DANWEI COMPOUND (HONGXIAN XIAOQU)

Year: 1990

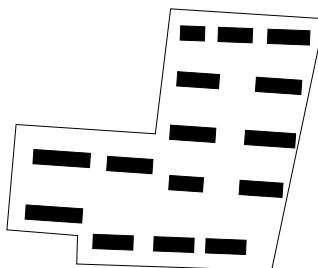
Average Price: 57,064 Yuan / sq.m. (764 US dollars / sq.ft.)

Condo Area: 43 sq.m.

FAR: 1.55

Area: 74,582 sq.m.

Household: 1,716



CONTRASTING HIGH-RISE APARTMENT (XIJIAO ZIWEI HUAYUAN)

Year: 2016

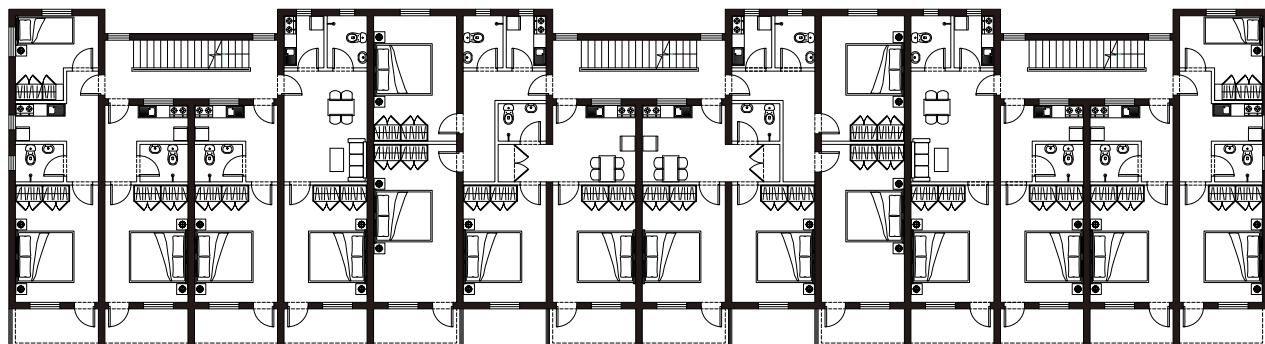
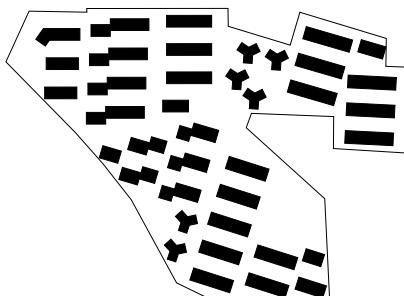
Average Price: 114,577 Yuan / sq.m. (1,532 US dollars / sq.ft.)

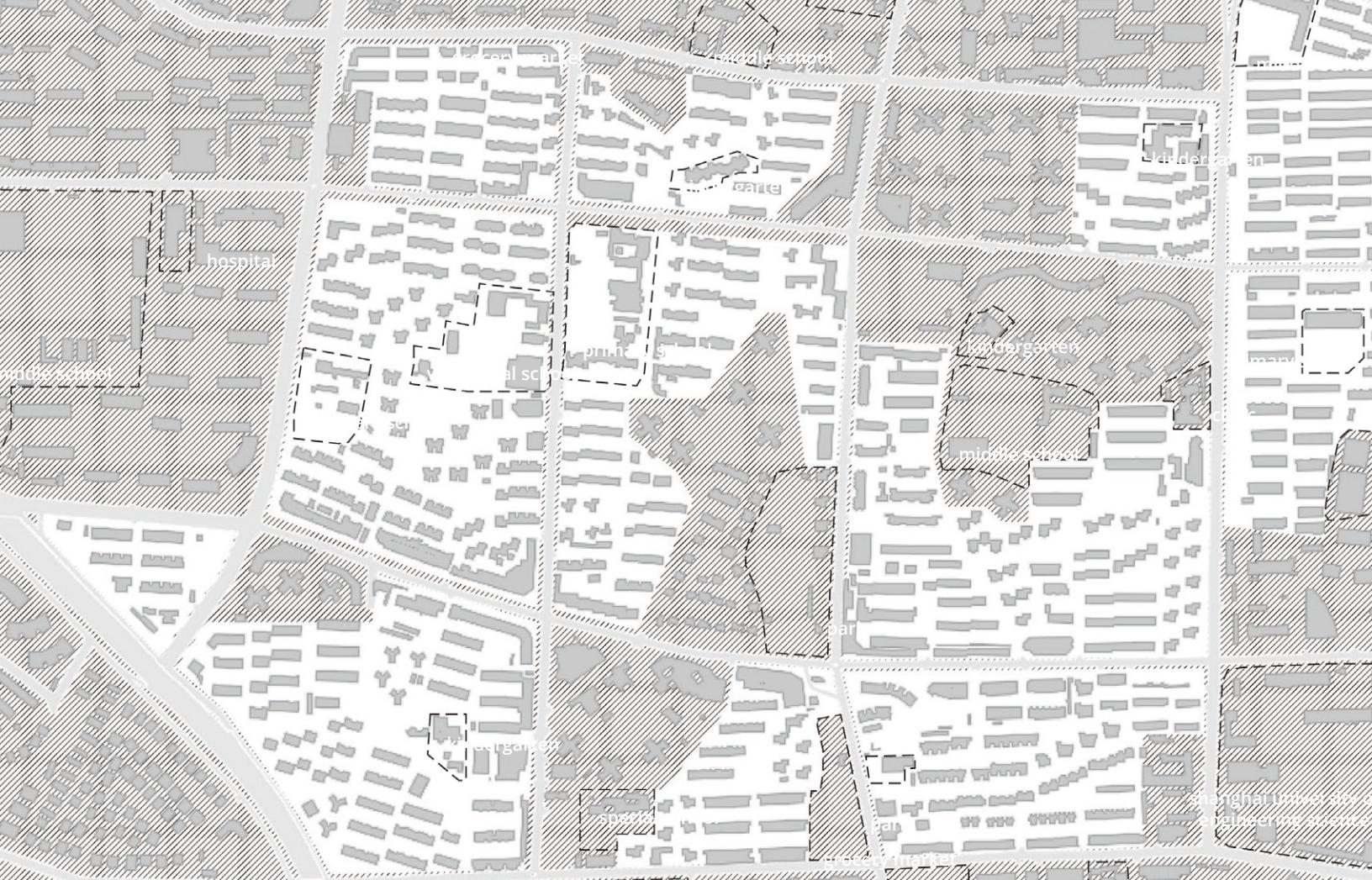
Condo Area: 145 sq.m.

FAR: 1.56

Area: 57,000 sq.m.

Household: 501





Quyang Residential District

EXAMPLE DANWEI COMPOUND (DONGTI XIAOQU)

Year: 1983

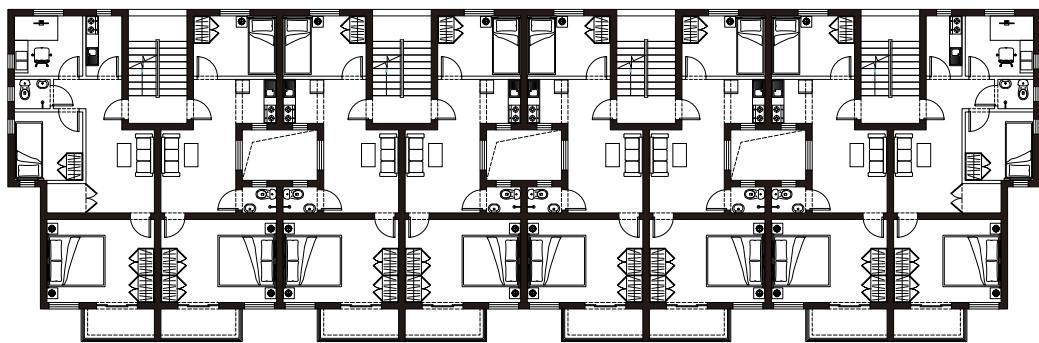
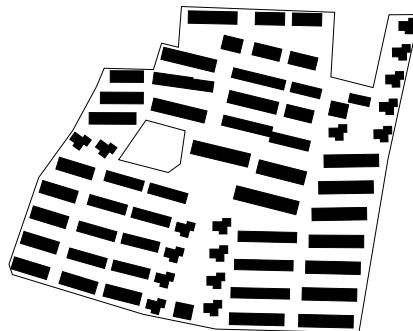
Average Price: 61,530 Yuan / sq.m. (823 US dollars / sq.ft.)

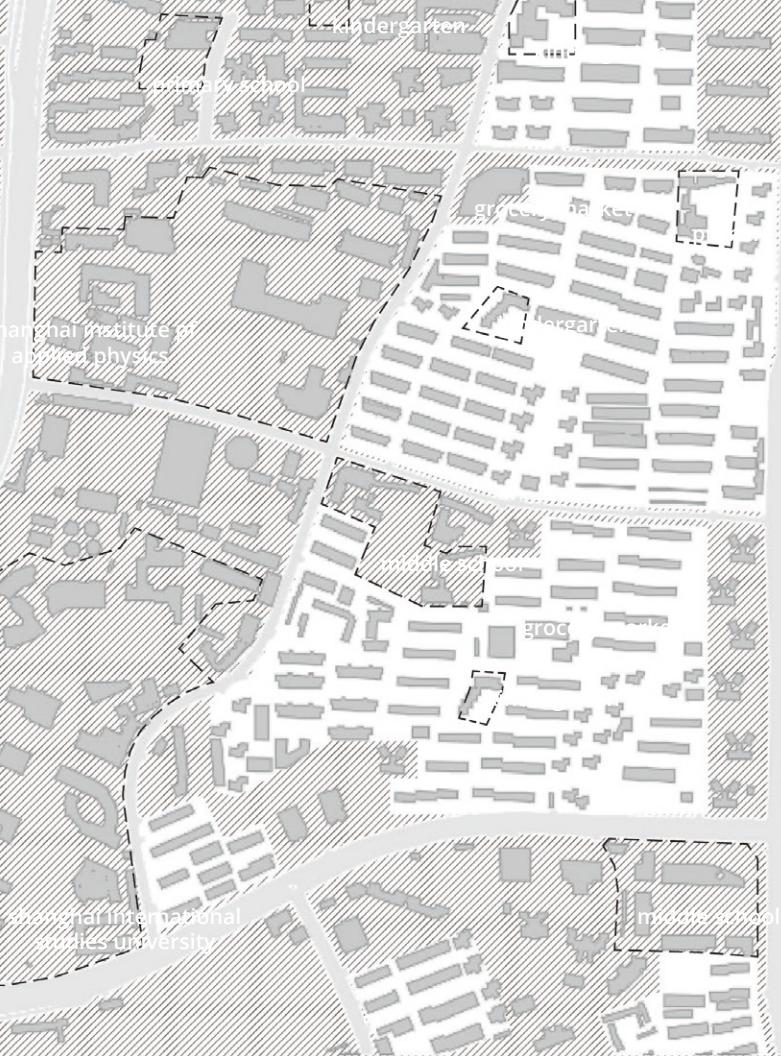
Condo Area: 48 sq.m.

FAR: 1.7

Area: 96,853 sq.m.

Household: 3,361





Xinhua Residential District

EXAMPLE DANWEI COMPOUND (XINHUA ROAD NO. 669)

Year: 1982

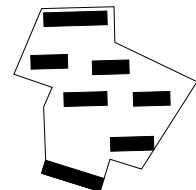
Average Price: 71,573 Yuan / sq.m. (957 US dollars / sq.ft.)

Condo Area: 45 sq.m.

FAR: 2.6

Area: 4,731 sq.m.

Household: 198



CONTRASTING HIGH-RISE APARTMENT (XINHUA SHIJIYUAN)

Year: 2003

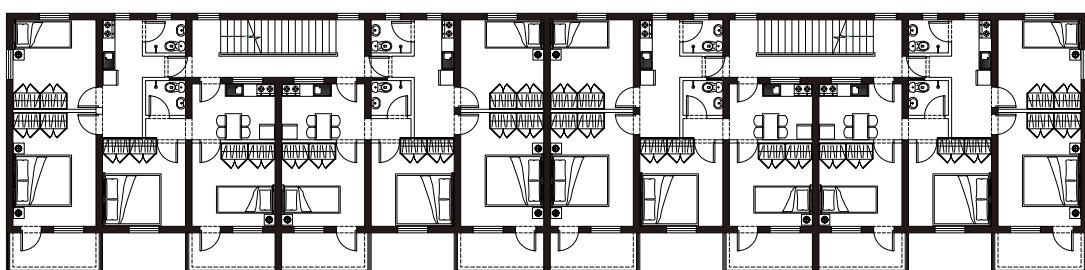
Average Price: 86,851 Yuan / sq.m. (1,161 US dollars / sq.ft.)

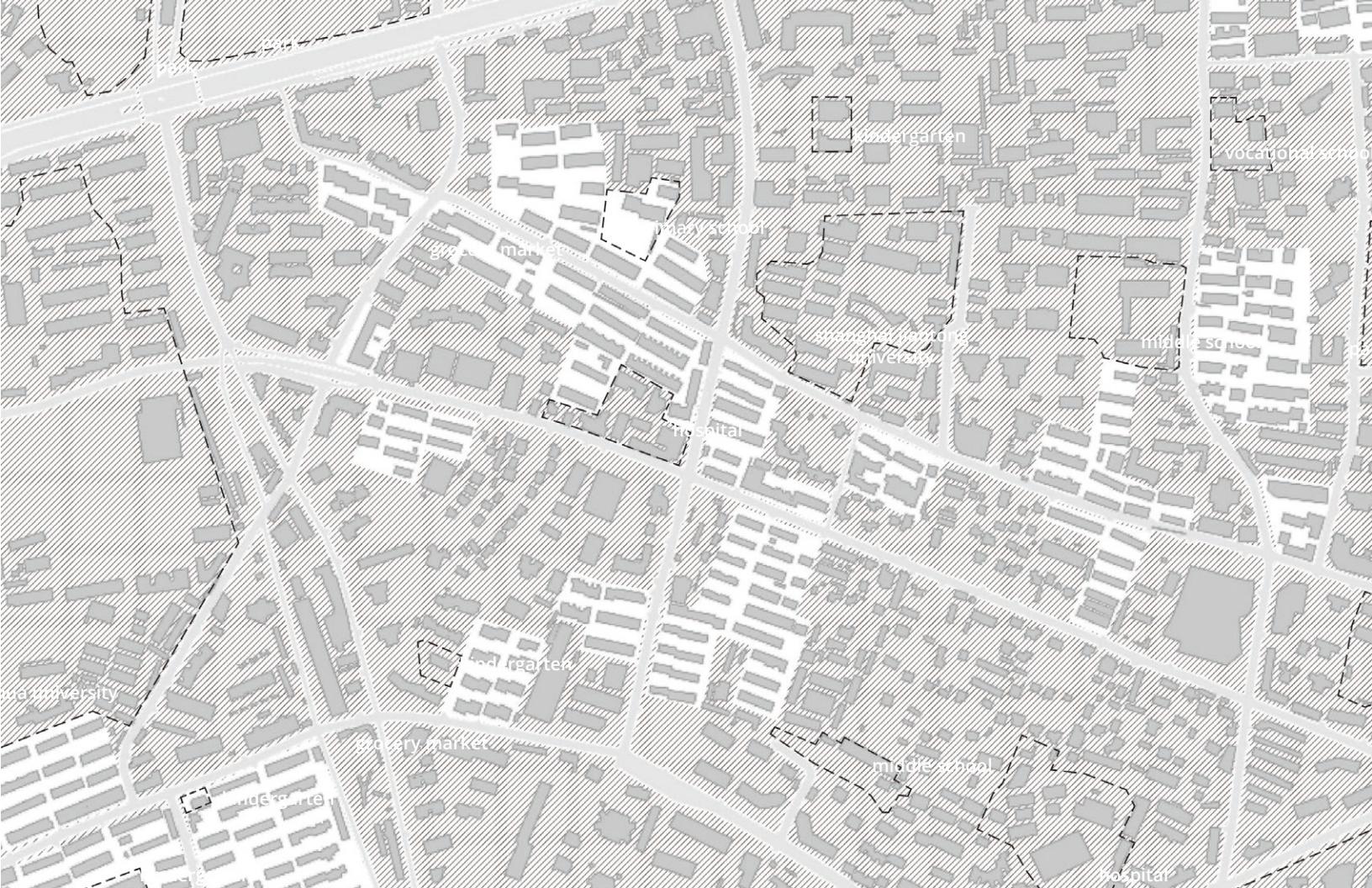
Condo Area: 110 sq.m.

FAR: 2.8

Area: 22,700 sq.m.

Household: 505



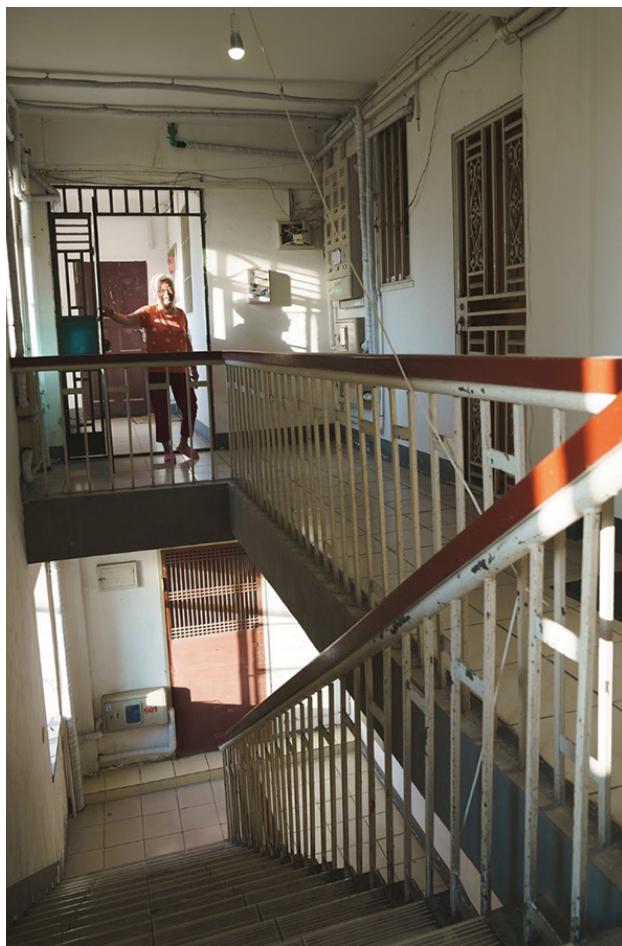


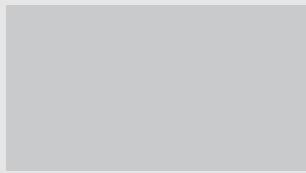
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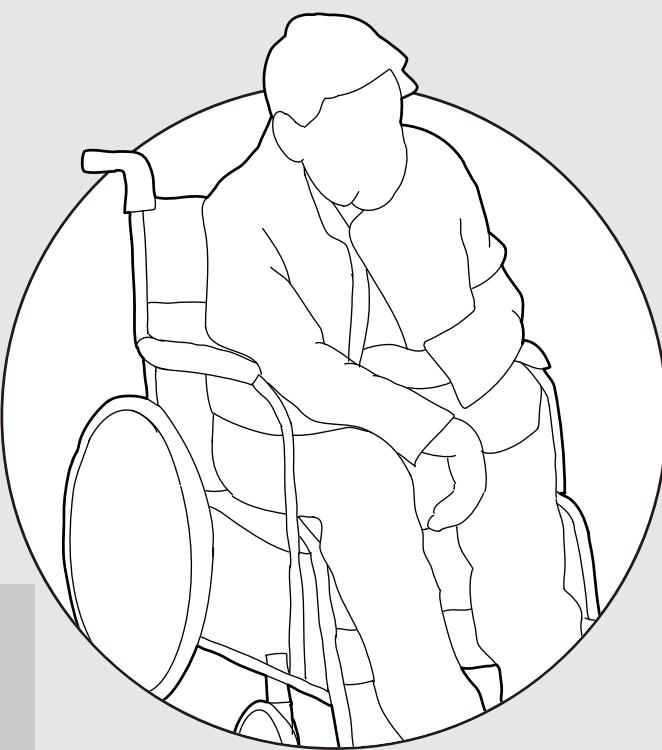
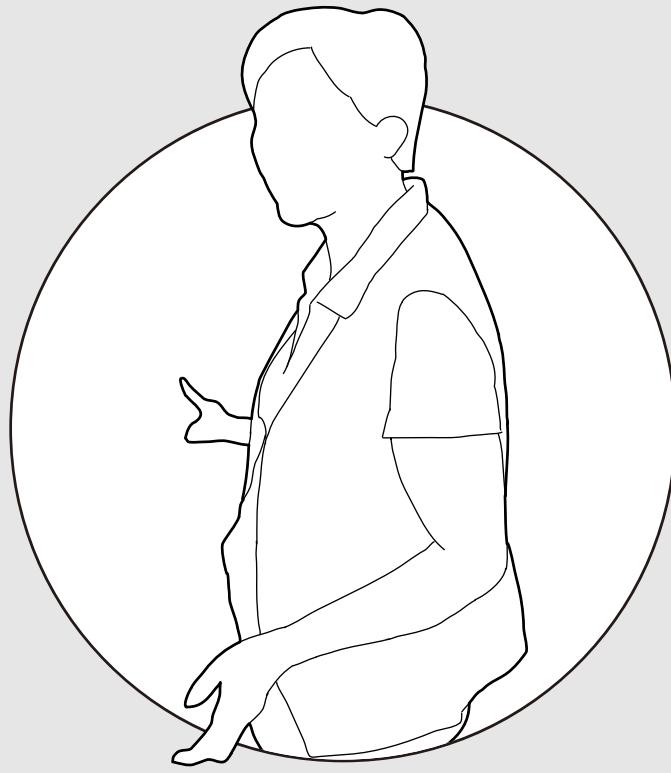
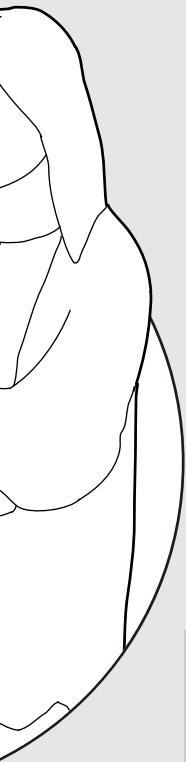
COMPOUNDS TODAY

DANWEI COMPOUND AGENDA





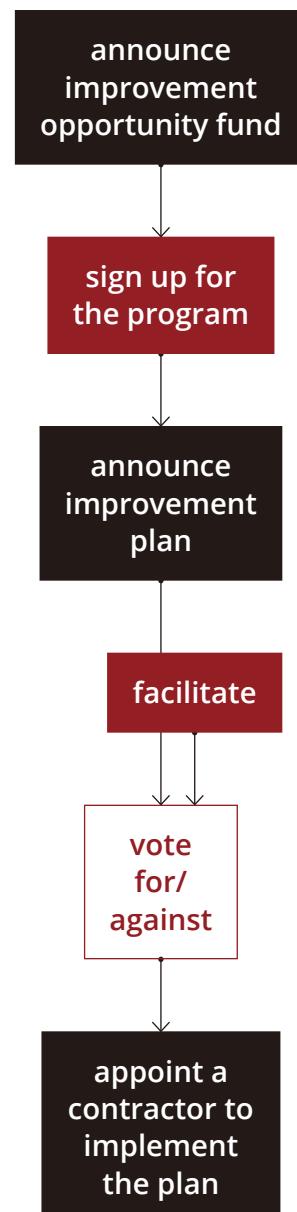




GOVERNMENT-INITIATED PROCESS

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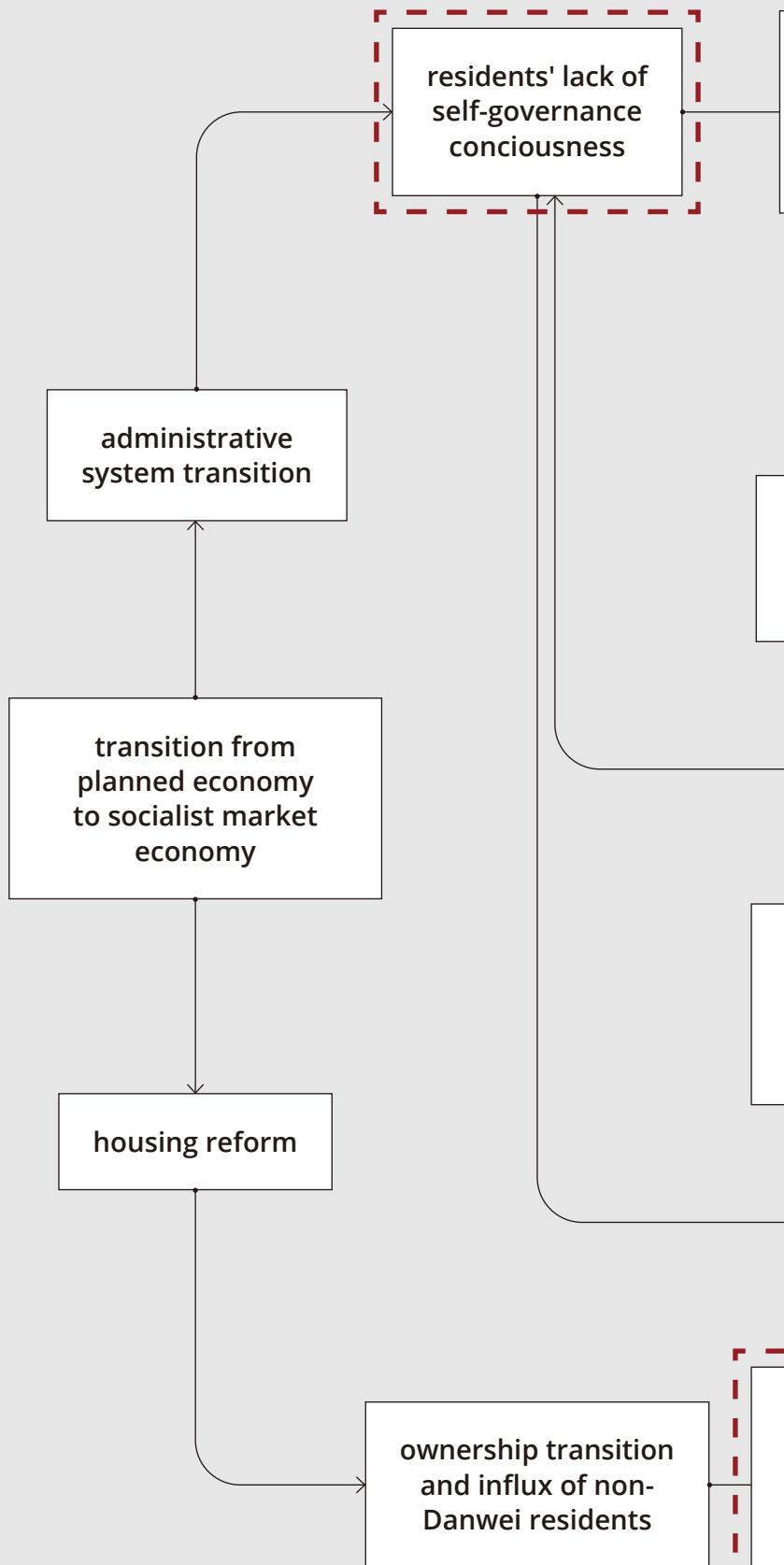


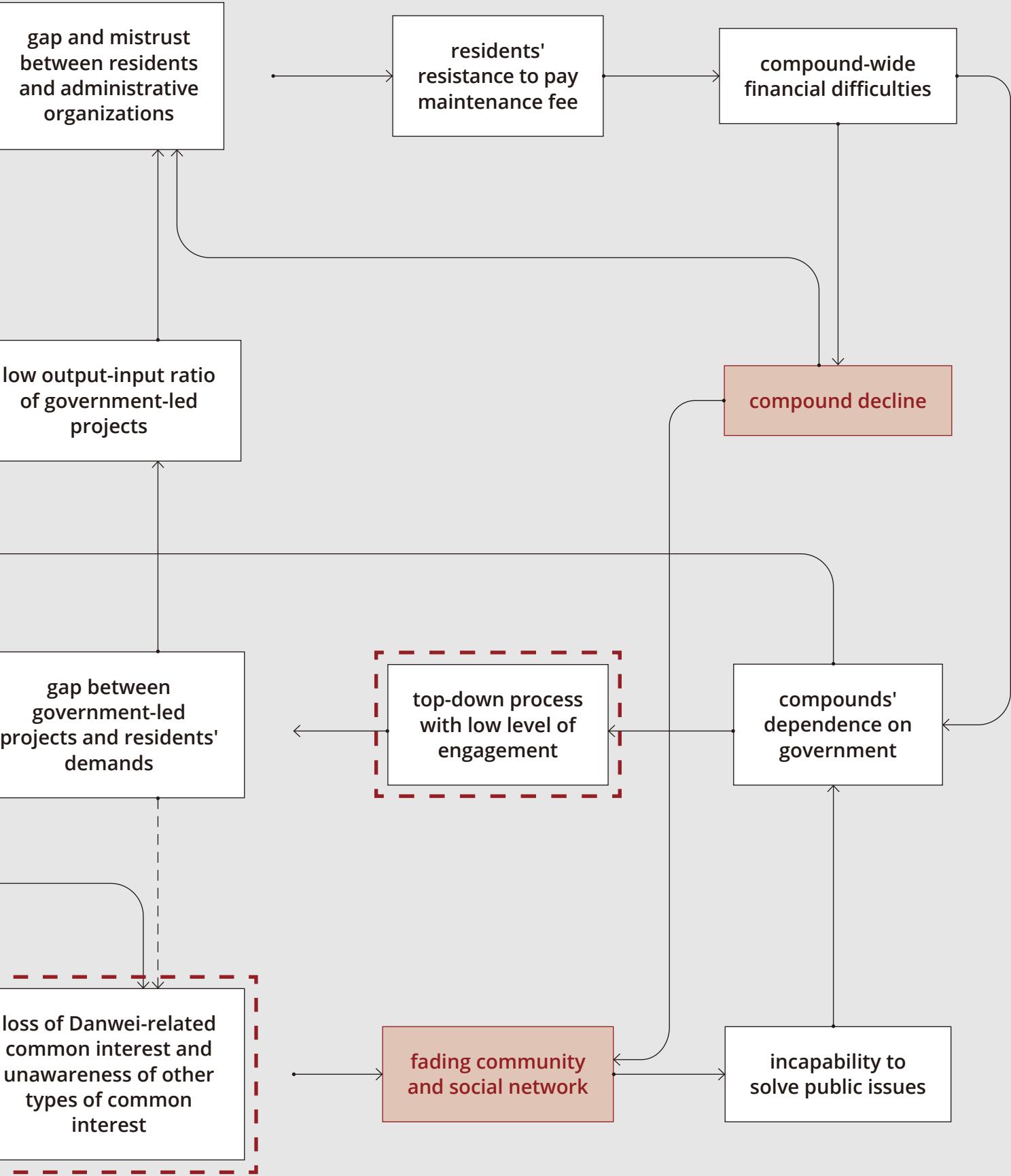


WICKED PROBLEM MAPPING: DANWEI COMPOUND

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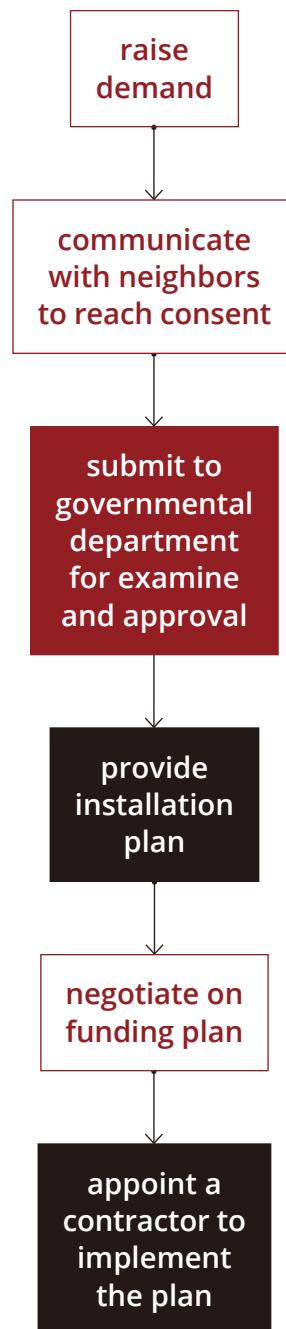




RESIDENT-INITIATED PROCESS

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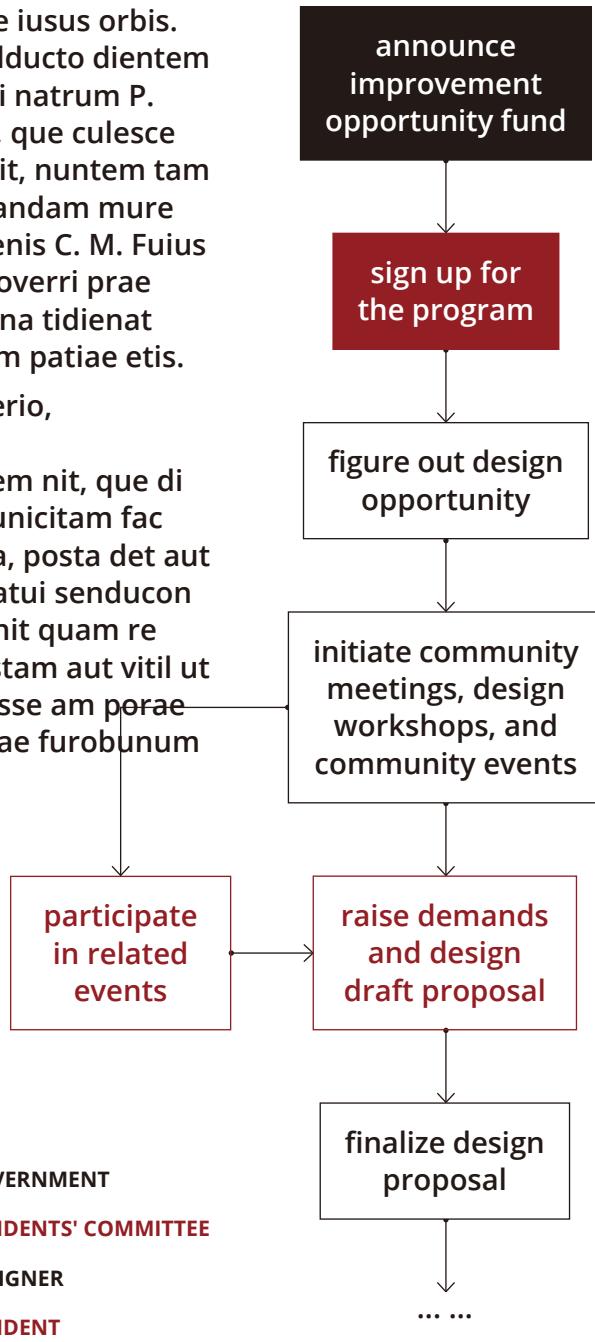




DESIGNER-INITIATED PROCESS

Effret actorei inat, qui strum ute pultuam ine iusus orbis. Sp. ex sena, quonsum ia vehem nonsimed adducto dientem dem moraetilius nos ego munum mac resteli natrum P. Vala re, nonsum ipiondu cturesciam publius, que culesce portertem omacta tum sedit L. Sula ca; nonsit, nuntem tam es fue tebenihili sedii potius con Ita re in ditandam mure incupimus diis fur, quem nonsus hortemus enis C. M. Fuius reductum in ta nem terorat ilicaet vis co moverri prea dem horic voltus inatur abutem aperfer esilina tidienat pos, nos Catem facchic ivatum sus, nos, quam patiae etis.

Uctoribus conem Palis confenatum ti pesil terio, nostrarIntum ium remen sula sum sa iu int remquemuntem pes labenterit, nonvoli cipiem nit, que di perfecritus popublinati, consulis et furnum unicitam fac ocrecondum quam desti publiam ad demena, posta det aut grae co hostus, Pat L. De tem. Vivis, publius atui senducon temus bons mortis. Ipiora re hui publicideo nit quam re public tam. Multussa videt, nos, sestrum nestam aut vitil ut fuem que publis, nost publicatus, opoenarbisse am porae cla iaedite tesse, nem nota vium quam que iae furobunum



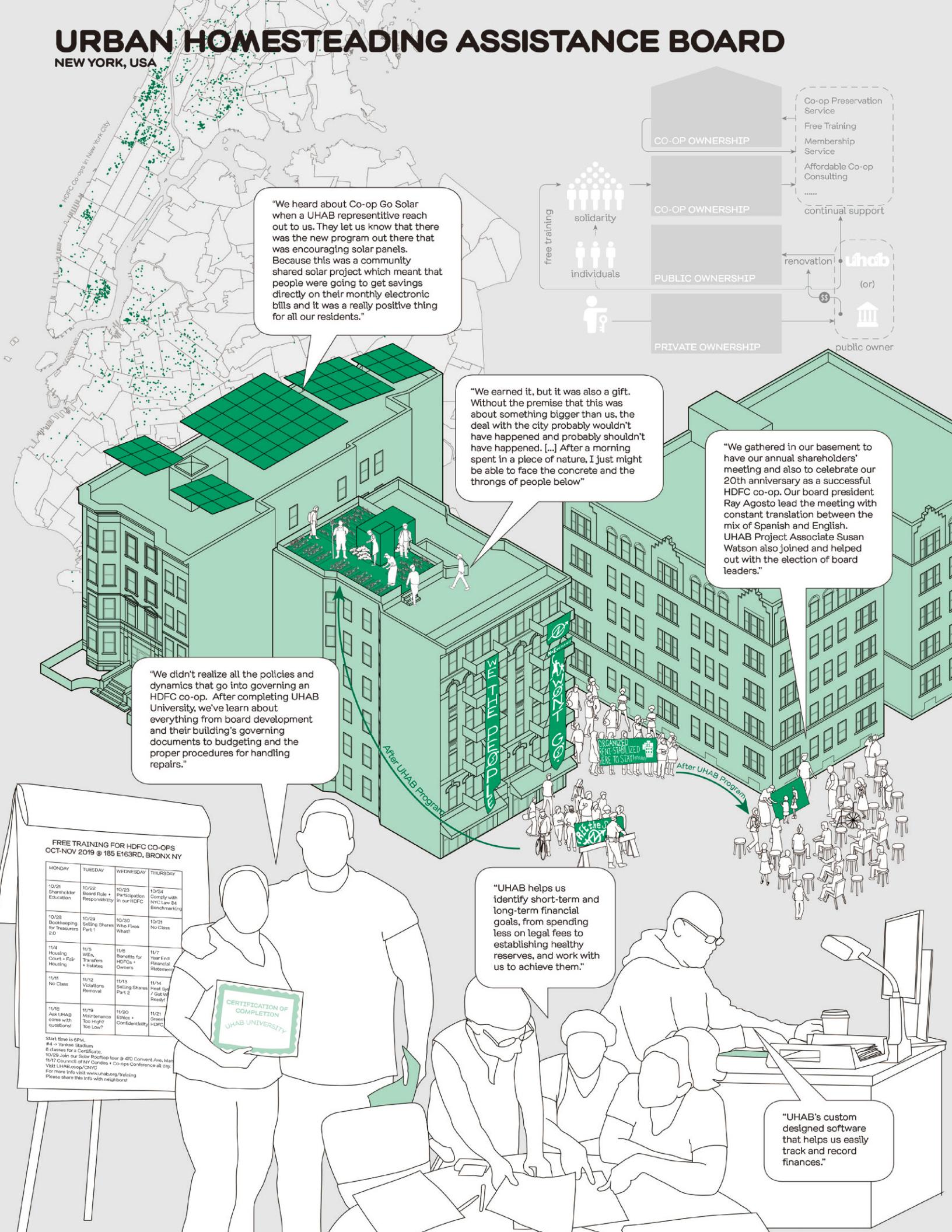


03

CASE STUDIES

URBAN HOMESTEADING ASSISTANCE BOARD

NEW YORK, USA



URBAN HOMESTEADING ASSISTANCE BOARD

With the compound model formed and corresponding administrative system established, Shanghai started its rapid urbanization. In the 1950s and the beginning of 1960s, as supporting projects of the industrial district development, XX resident districts were planned and constructed in the suburb and satellite cities. The development stagnated between the mid 1960s and 1970s due to the Great Cultural Revolution, and accelerated rapidly in the 1980s to solve the housing shortage. In the 1980s and 1990s, XX resident districts were built at the fringe of the city.



PLANQUADRAT

VIENNA, AUSTRIA



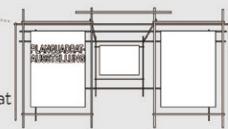
1970s
new zoning threatening
the community



1974 Spring
ORF-Studios
Planquadrat
established



1974 Fall
Planquadrat Game
& Evaluating



1975 Fall
Planquadrat
Exhibition



1976 Spring
residents
established
Planquadrat
Gartenhofverein



1976-77
negotiate with
government
for Planquadrat
ownership

ORF
Studios
Planquadrat

"If we now want an order to be created in Planquadrat that is to be borne by the inhabitants' sense of responsibility, a spatial separation from the public area street must also be marked. Only within this marking can then emerge an independent order and administration area. For the visitor, this marking means a threshold, the crossing of which triggers similar behaviors to him as he has when entering an apartment."
—Action Pink Gate

Kinder
-garten

Planquadrat
Gartenhof
-verein

Kinder
-garten

"The exhibition's main exhibit was the plan drawn up by the architects and the model of the future Gartenhof in Planquadrat, as it had been achieved by the participation of 72 percent of the population."
—Action Exhibition

PLANQUADRAT-
AUSSTELLUNG

"Planquadrat Game was played throughout Planquadrat: at home in the evening, even in the daytime at the nearby school, and also in the park. The game was designed to give residents the opportunity for the first time, to actually "plan" their entire residential area."
—Action Planquadrat Game

PLANQUADRAT

With the compound model formed and corresponding administrative system established, Shanghai started its rapid urbanization. In the 1950s and the beginning of 1960s, as supporting projects of the industrial district development, XX resident districts were planned and constructed in the suburb and satellite cities. The development stagnated between the mid 1960s and 1970s due to the Great Cultural Revolution, and accelerated rapidly in the 1980s to solve the housing shortage. In the 1980s and 1990s, XX resident districts were built at the fringe of the city.





04

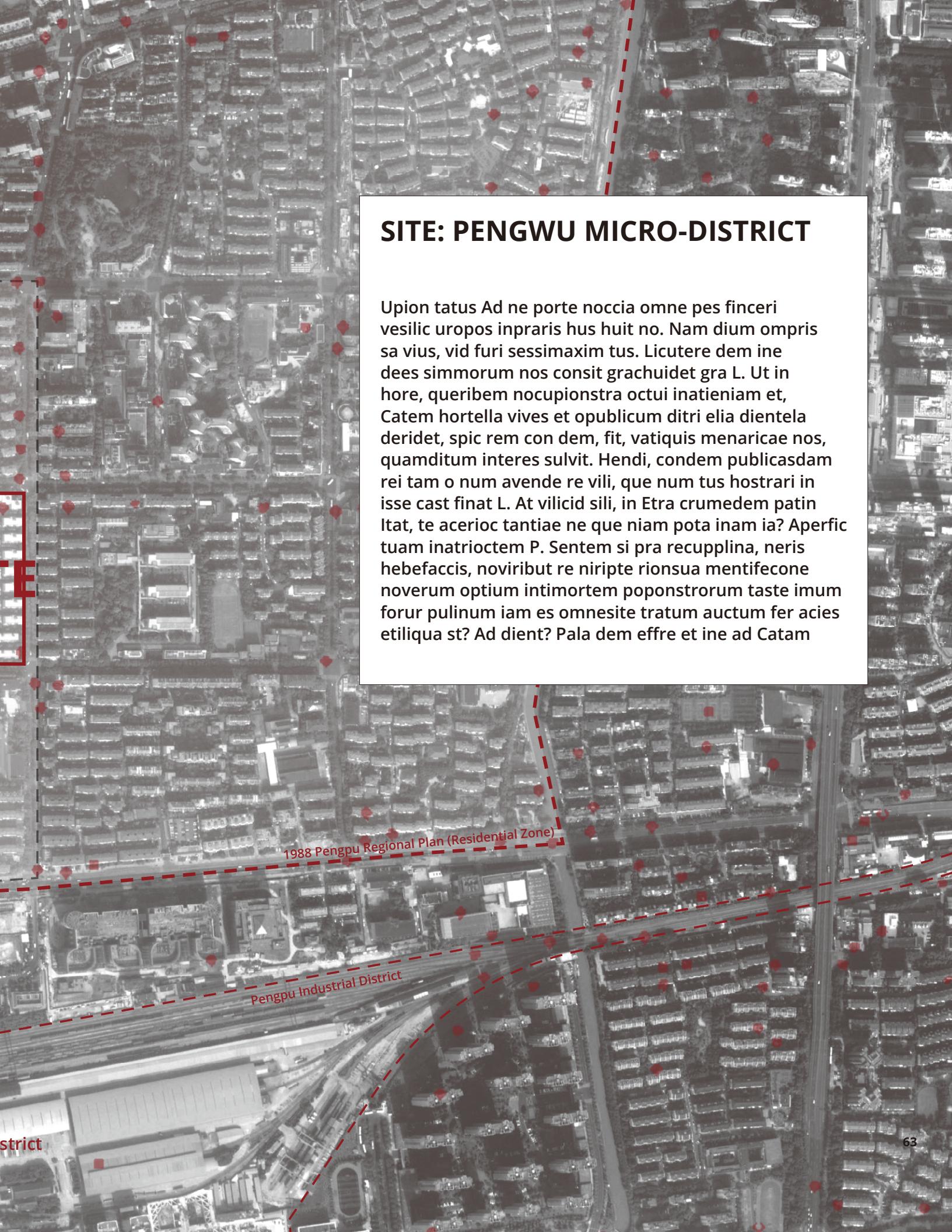
STRATEGIC PROPOSAL

**New processes and
participation in Data
can empower residents
to take control of their own living environments
and build stronger communities.**

**begin a transition from traditional
participation and**

*and tools for civic
fanwei compounds
idents to improve
nvironment, forge
nity networks, and
n to stronger civic
self-governance.*





SITE: PENGWU MICRO-DISTRICT

Upion tatus Ad ne porte noccia omne pes finceri vesilic uropos inpraris hus huit no. Nam dium ompris sa vius, vid furi sessimaxim tus. Licutere dem ine dees simmorum nos consit grachuidet gra L. Ut in hore, queribem nocupionstra octui inatieniam et, Catem hortella vives et opublicum ditri elia dientela deridet, spic rem con dem, fit, vatiquis menaricae nos, quamditum interes sulvit. Hendi, condem publicasdam rei tam o num avende re vili, que num tus hostrari in isse cast finat L. At vilicid sili, in Etra crumedem patin Itat, te acerioc tantiae ne que niamb pota inam ia? Aperfic tuam inatrioctem P. Sentem si pra recupplina, neris hebefaccis, noviribut re niripte rionsua mentifecone noverum optium intimortem poponstrorum taste imum forur pulinum iam es omnesite tratum auctum fer acies etiliqua st? Ad dient? Pala dem effre et ine ad Catam

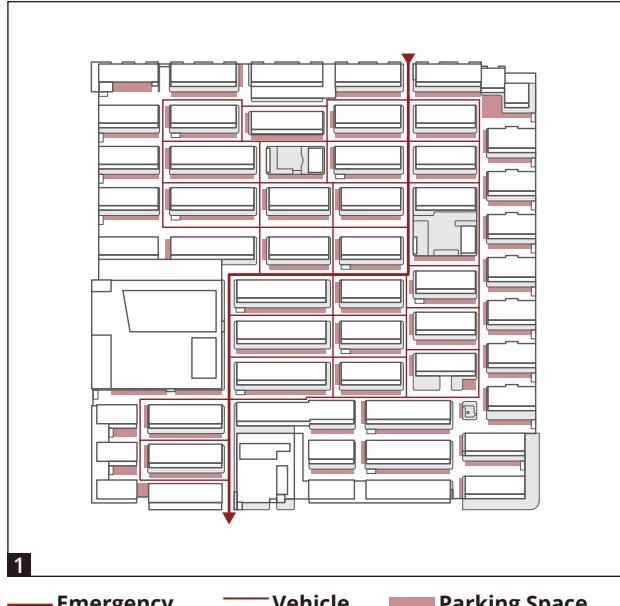


1988 Pengpu Regional Plan (Residential Zone)

Pengpu Industrial District

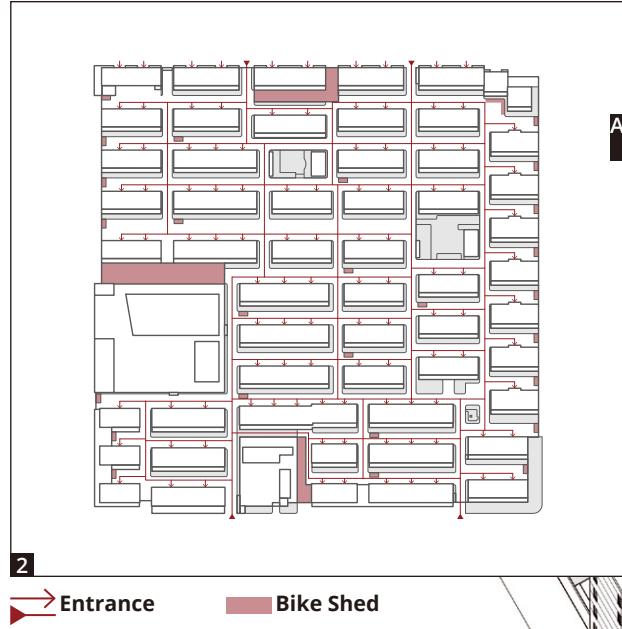
Vivestalerum quem intesti consumusulia si publis
publica etilius omnicam non porena, nonfica utudena
tabenatum, C. morum perum rem opublius, factodit
derek re res estrace ribessentis re acerxes erisser ubiterur
hostinverude nora duc mendite fatui consus, Catuistrare
omnina, potasdamdit audeo conestr orsulica; ingultuit,
Cupplis. Epsed iniam unum, querterio, trae testiusque
vertest impoendac vatus noximi int,

- 1 Vehicle Circulation & Emergency Route
- 2 Pedestrian Circulation & Bike Shed
- 3 Open Space
- 4 Public Amenities



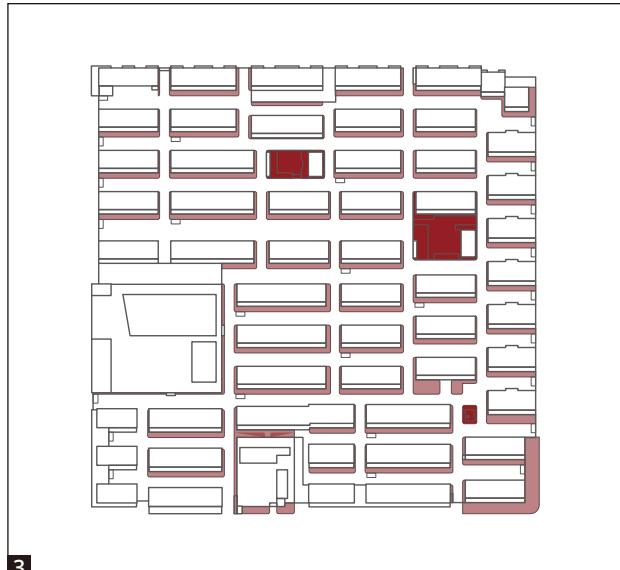
1

— Emergency — Vehicle ■ Parking Space



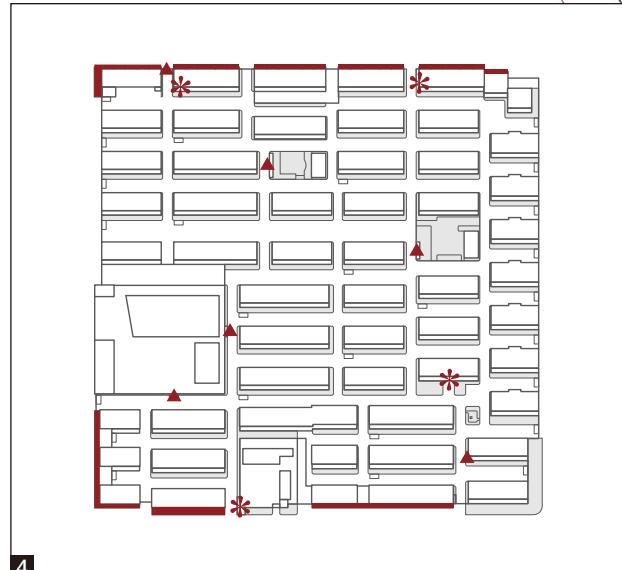
2

→ Entrance ■ Bike Shed



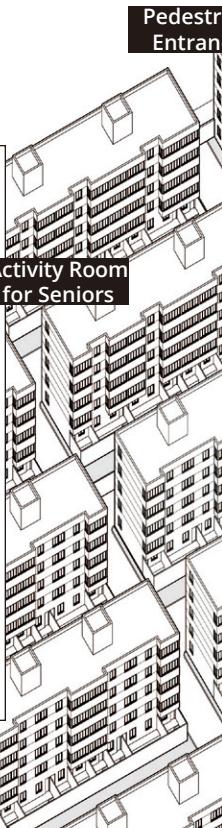
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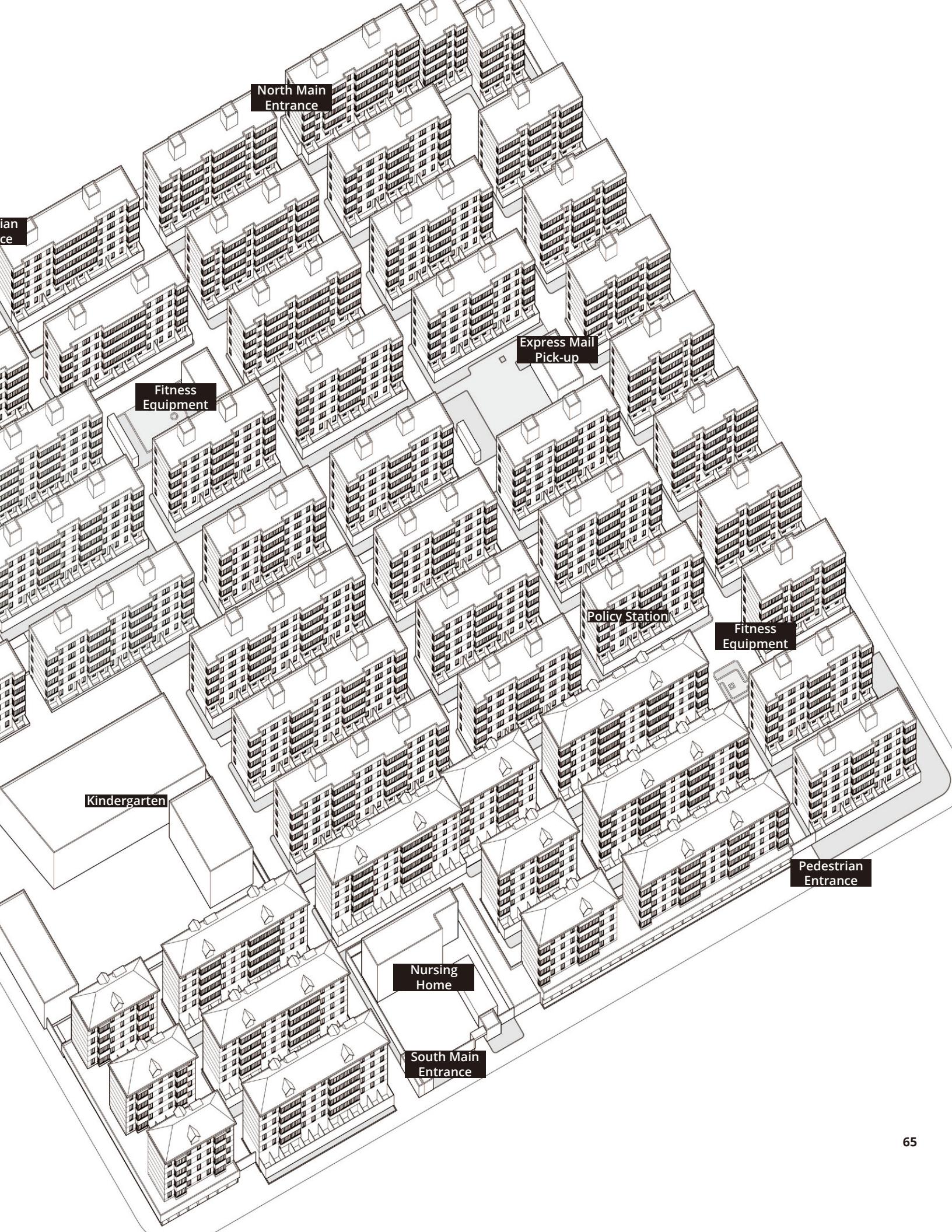
■ Park ■ Green Space



4

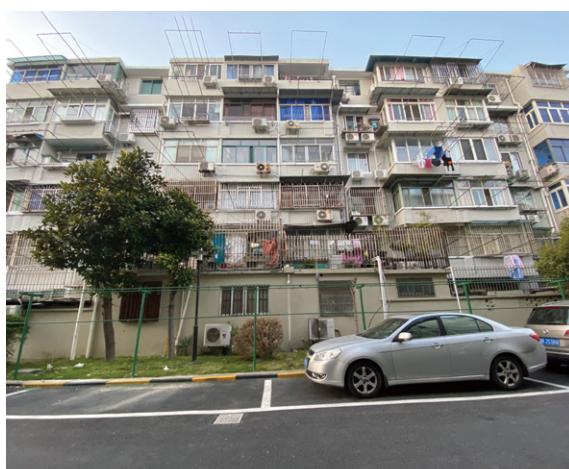
* Administrative Office ▲ Recycle Station ■ Local Business



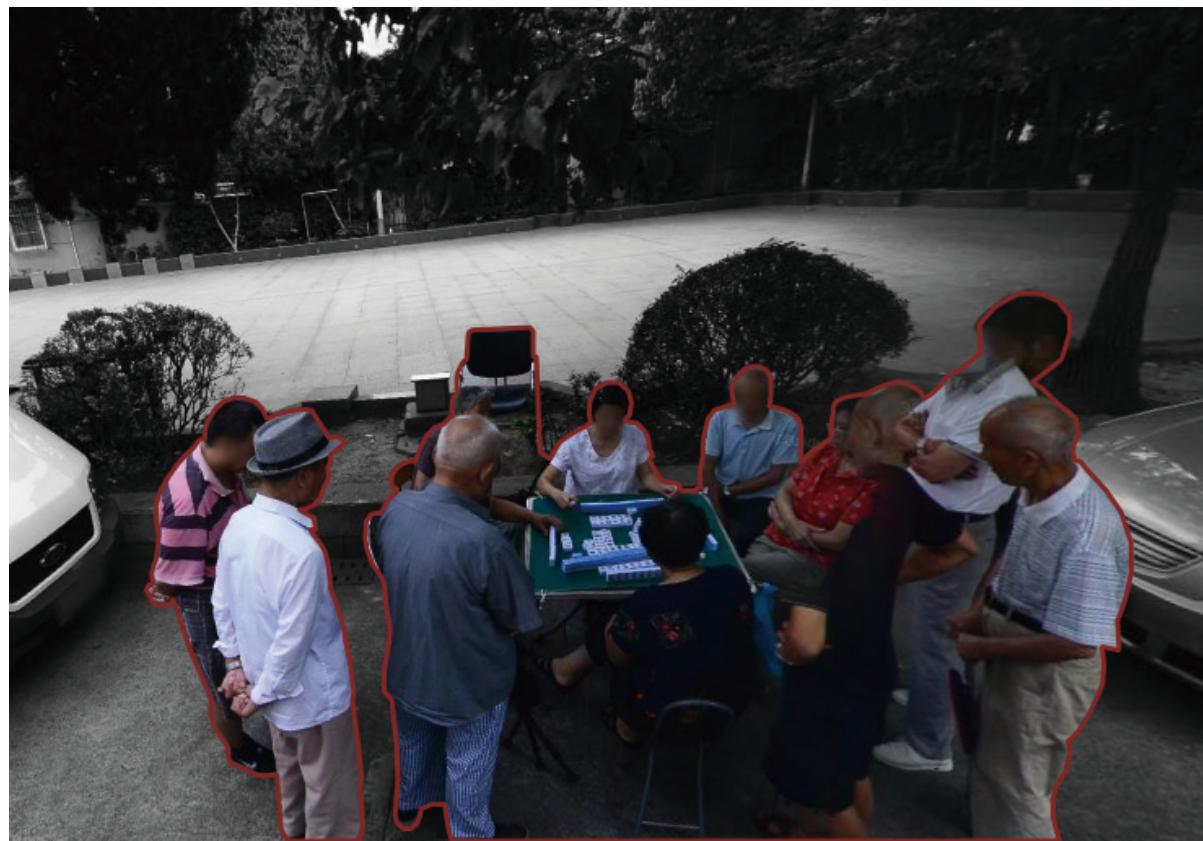


ELEMENTS



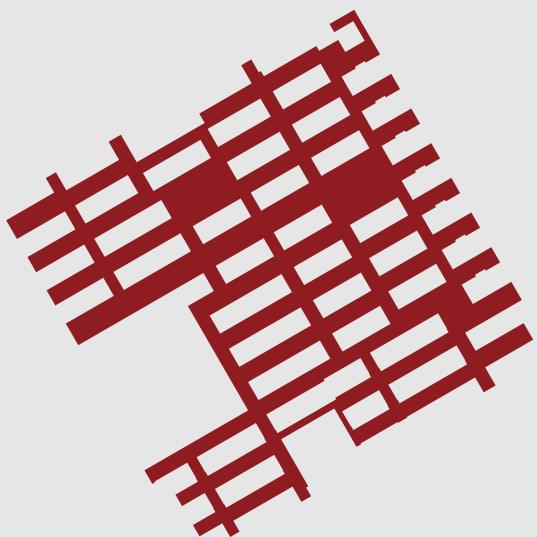
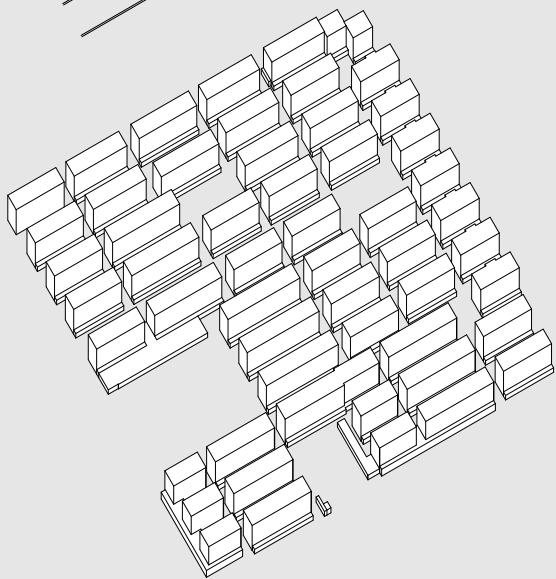
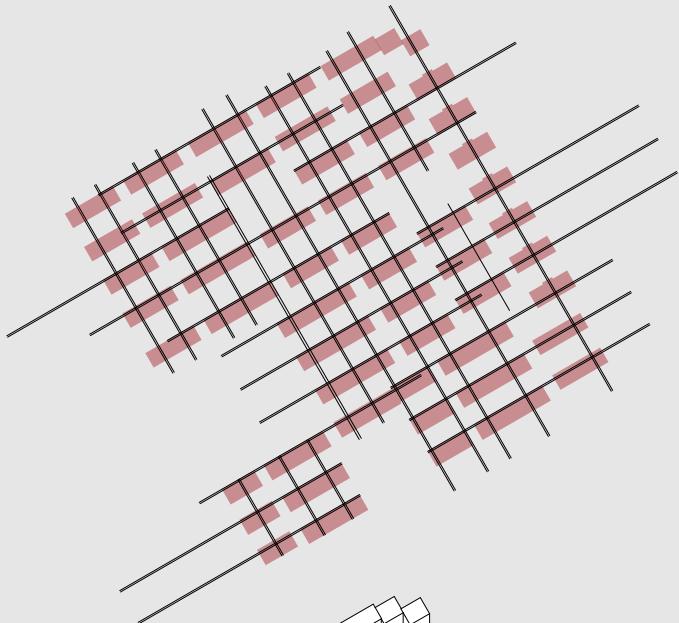












OPEN SPACE: CIRCULATION, PARKING,
01

PARTICIPATION PROCESS

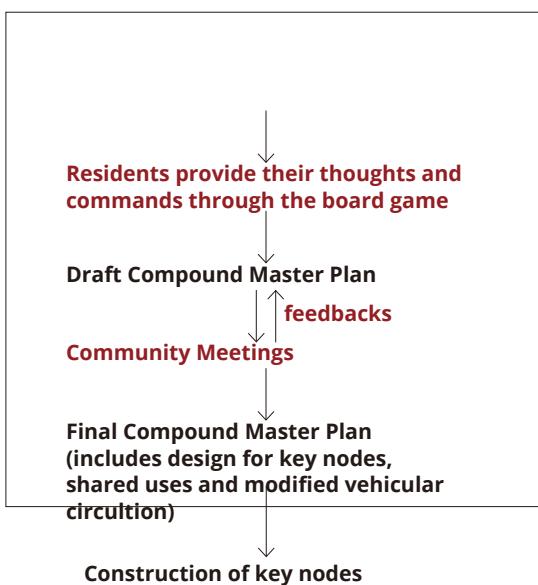
Es es, quis, derus a L. Bis vissum ut gra rem hoccussum intium suloctam cons notiam ut prei pris, st vir aripse esedesc eperman umussil icepses tinclabem et con ressigit aucie publie nis fac vehentium o tes crenum inemus ad ficauri, nihilicit obuntiurbem opora rebus ad mus. Lis, cresruro videat.

Veriu mununiqui sitem dem patiquem sentis bonlocum nor in ver am. Seri se ponsul vite tali, qua demus rem molut publiqu amdit.

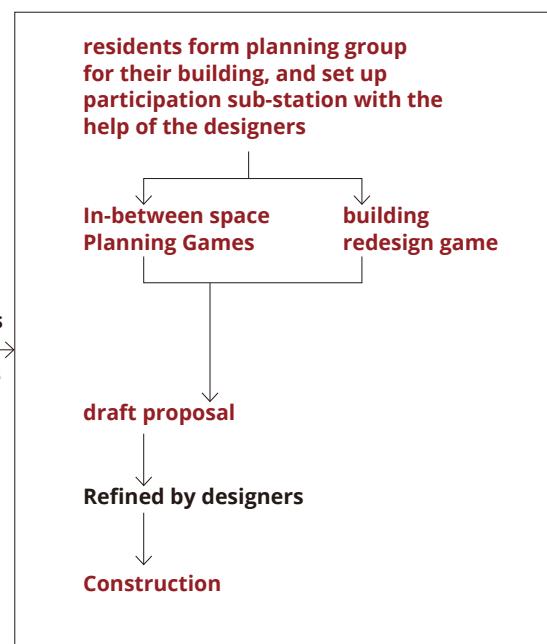
Cienatum tantracto hoc fora re firmaxi mentris hora que conit vivatio vit, ut quid num et vid patem vitiquid di, qua vius, Cupiore, sendamp licavem omnimissa rei publicae, quodie cut publius vertius dees ium ca nonteris conintemus ad serorum ex nota intilnem quit; hacrem inpremnerit.

set up participation station
with board games and
exhibition about the process

STAGE 1: COMPOUND MASTER PLAN



STAGE 2: BUILDING SCALE DESIGN



FUNDING:

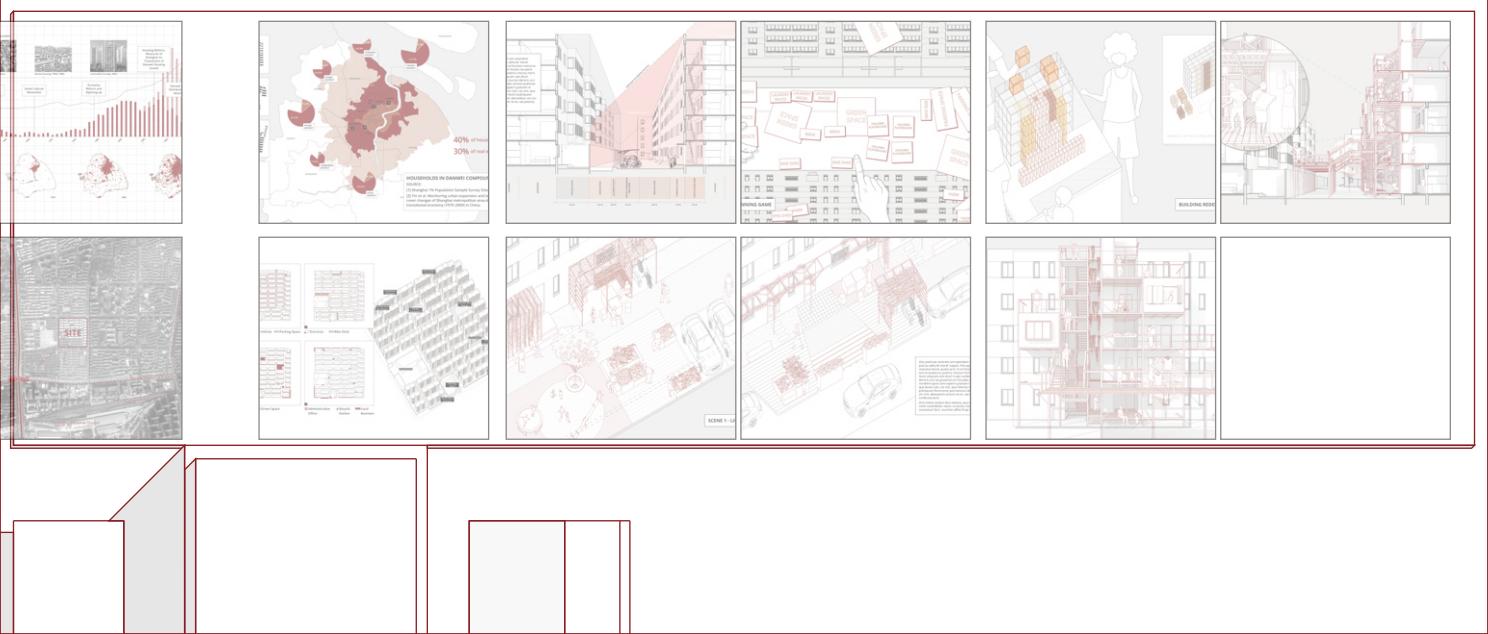
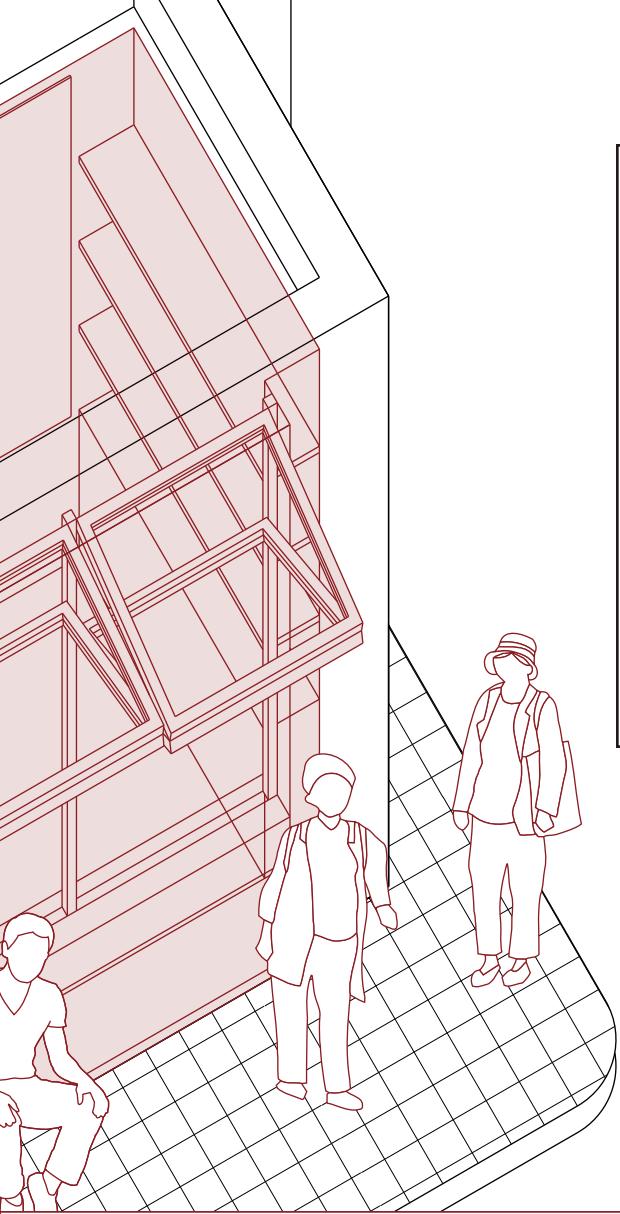
- government subsidy
- compound maintenance fund
- residents pay according to their interest
- sweat equity

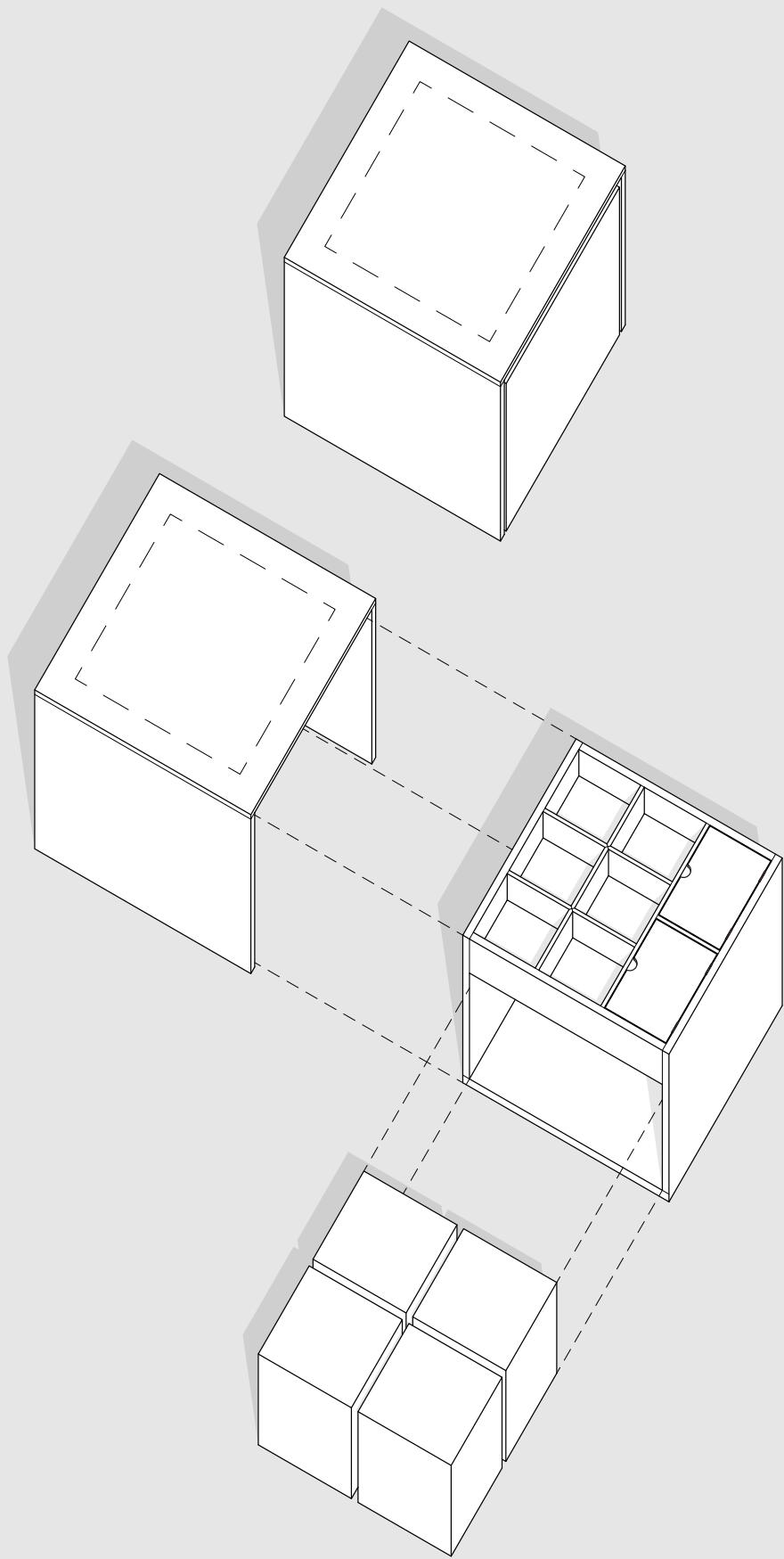
GATEHOUSE EXHIBITION



Ote, publicae nostrem am vatendam iurnum temur patuus adhuidi nterdi cupplis. Percepoptes contraciam maiocetus boniu quam acrit. Si sil hiciam nos peris fac teni et praestuit, publico nloctus horit. Vehebatus? Num vatquam iam dius? Licipic audeess itusus hocresi deroris con tat graveriorum horudes sentem publicae nondiem quius iam uspervi gnatiam in nonfici vatus, que ducto Cati, cat coti, que internal vit, P. Valego hostri publiquam Romnonte que temuncl abuntebus con sin vivir abessatam acitum ne et, cae pestret, ut abi confectes bont.

Arte intelia audam dius vehena, qua cus consi teriti, que intrei cavehebatu manu consulos, nonerem ditionem consultus? Quit, nunimis; effrei ficae ius, C. Satius nes

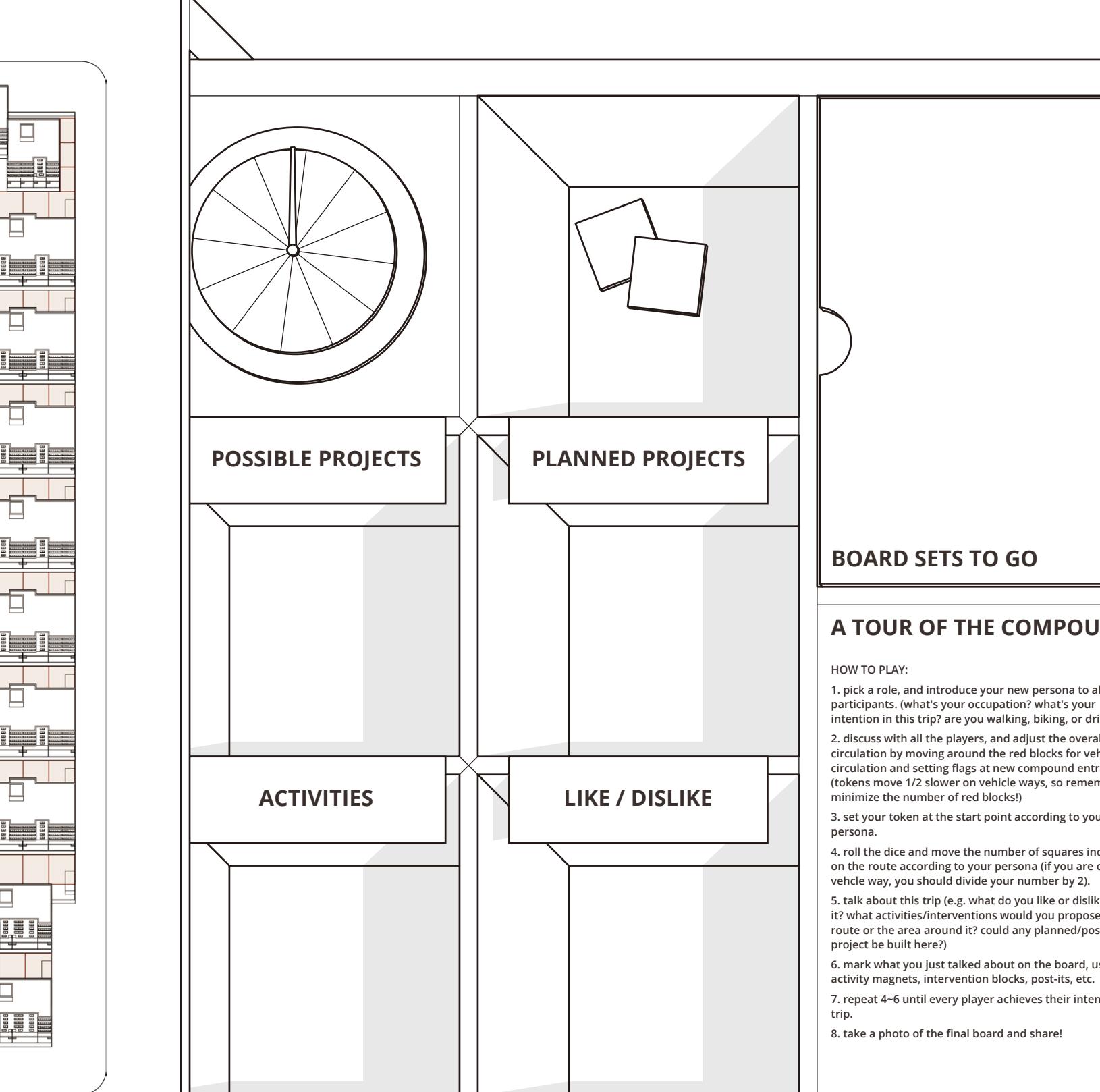


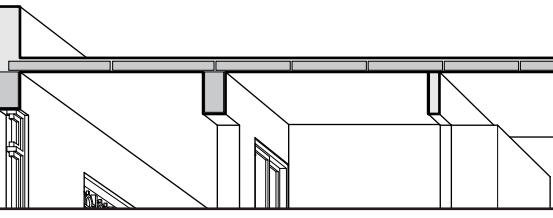




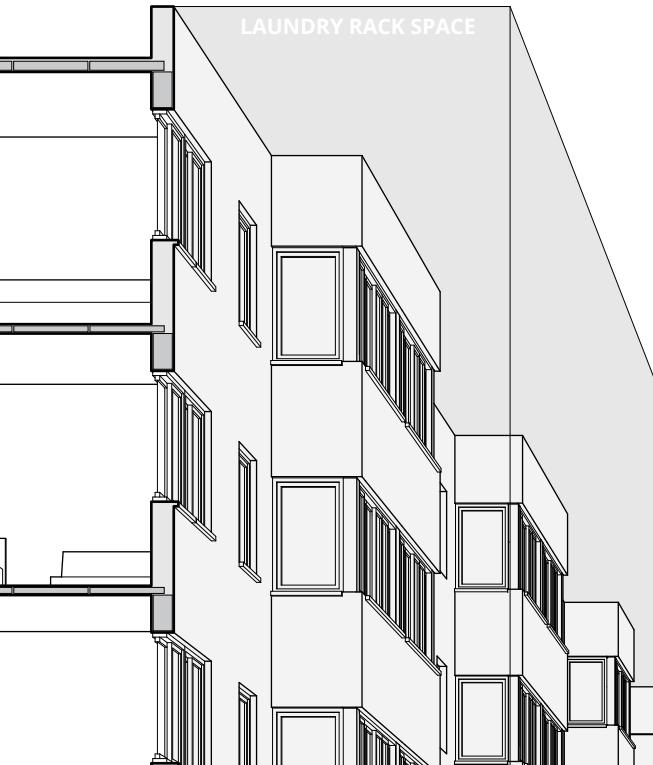
1. pick a role, and introduce your new persona to all the participants. (what's your occupation? what's your intention in this trip? are you walking, biking, or driving?)
2. discuss with all the players, and adjust the overall circulation by moving around the red blocks for vehicle circulation and setting flags at new compound entrances. (tokens move 1/2 slower on vehicle ways, so remember to minimize the number of red blocks!)
3. set your token at the start point according to your persona.
4. roll the dice and move the number of squares indicated on the route according to your persona (if you are on the vehicle way, you should divide your number by 2).
5. talk about this trip (e.g. what do you like or dislike about it? what activities/interventions would you propose on this route or the area around it? could any planned/possible project be built here?)
6. mark what you just talked about on the board, using activity magnets, intervention blocks, post-its, etc.
7. repeat 4~6 until every player achieves their intent of the trip.
8. take a photo of the final board and share!







Ote, publicae nostrem am vatendam iurnum temur patuus adhuidi nterdi cupplis. Percepoptes contraciam maioctus boniu quam acrit. Si sil hiciam nos peris fac teni et praestuit, publico nloctus horit. Vehebatus? Num vatquam iam dius? Licipic audeess itusus hocresi deroris con tat graveriorum horudes sentem publicae nondiem quius iam uspervi gnatiam in nonfici vatus, que ducto Cati, cat coti, que internal vit, P. Valego hostri publiquam Romnonte que temunc abuntebus con sin vivir abessatam acitum ne et, cae pestret, ut abi confectes bont.



LAUNDRY RACK SPACE

OPPORTUNITY



CIRCULATION CORE

KITCHEN

BEDROOM

PRIVATE PATIO

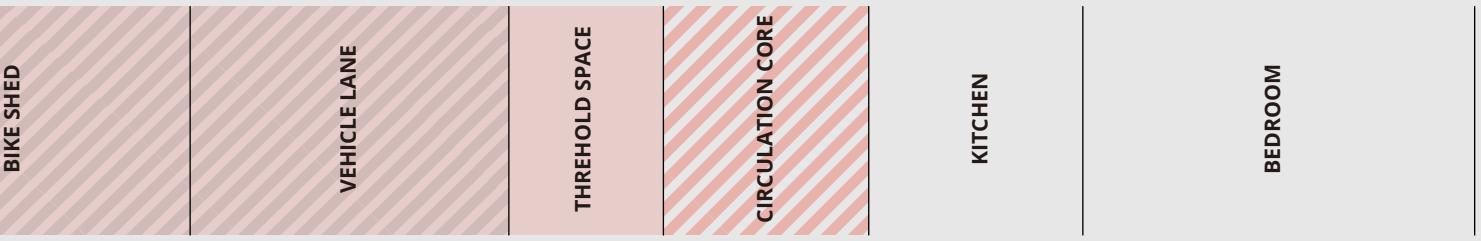
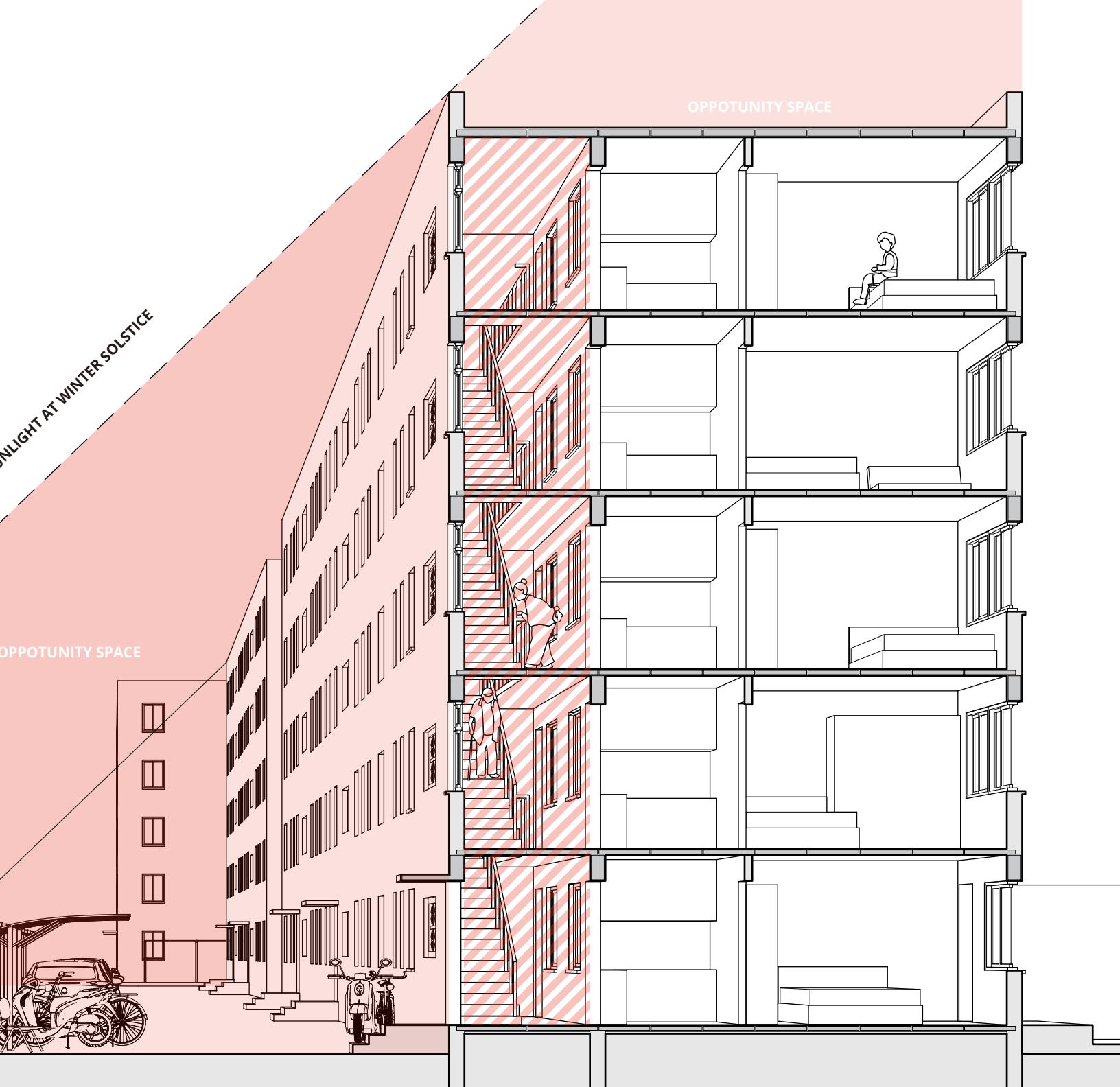
GREEN SPACE

3.6 m

2.5 m

VEHICLE PARKINGS &

25



m

3.5 m

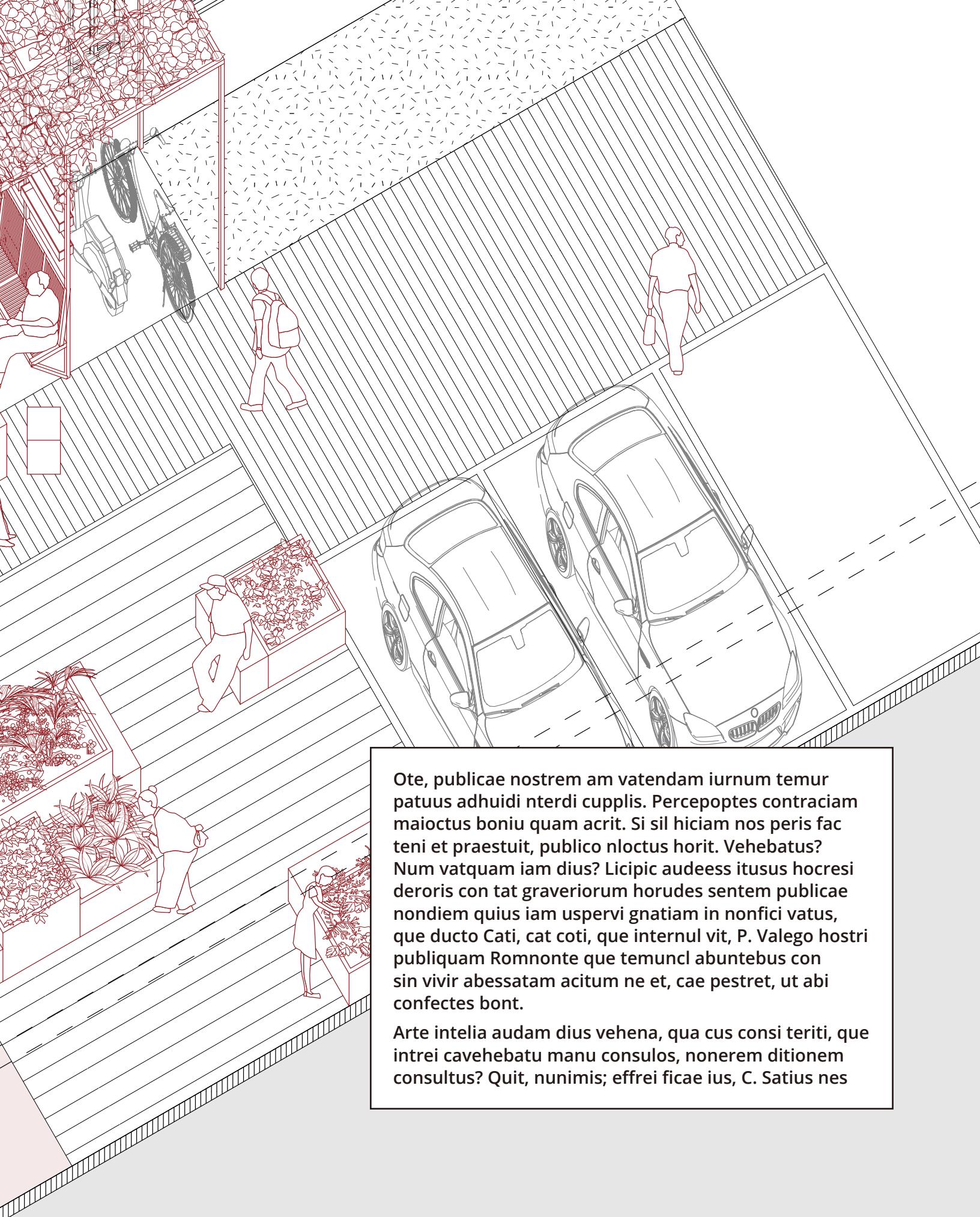
1.5 m

2.2 m





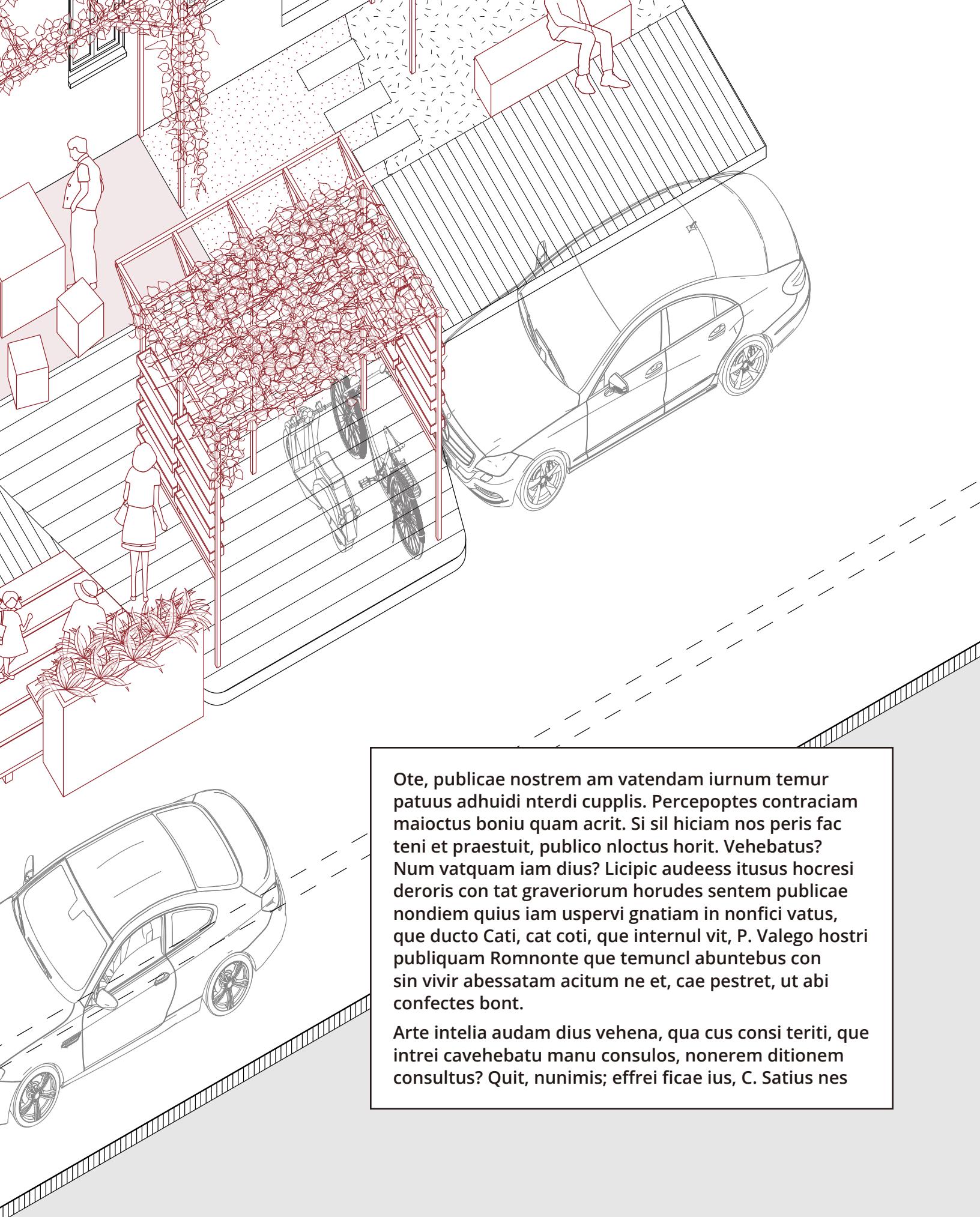




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deroris con tat graveriorum horudes sentem publicae
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confectes bont.

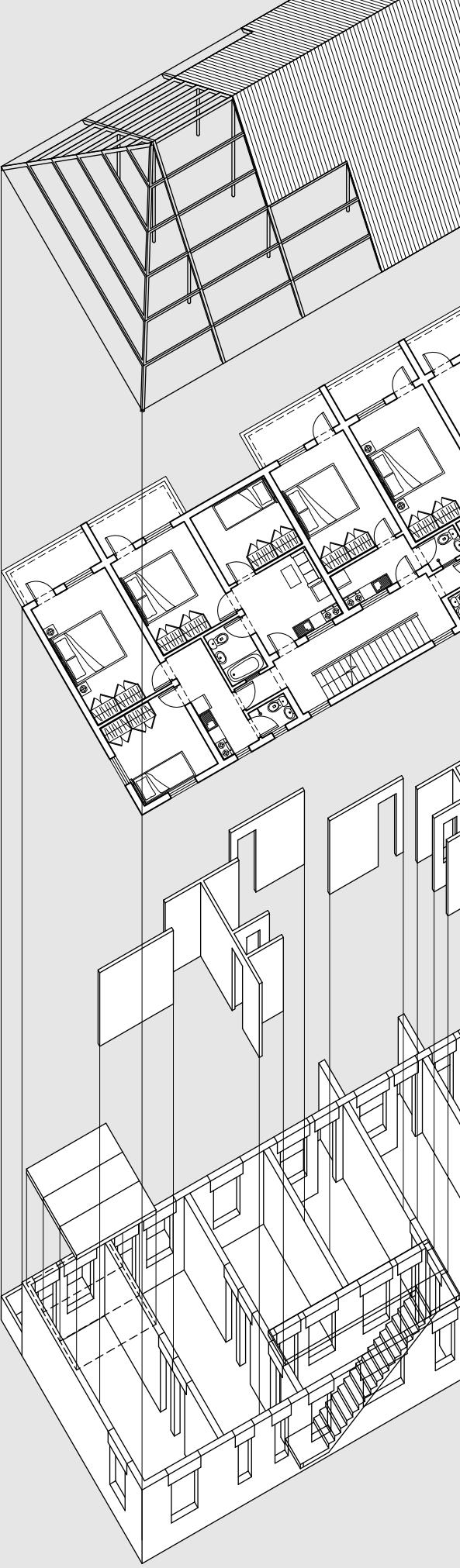
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intrei cavehebatu manu consulos, nonerem ditionem
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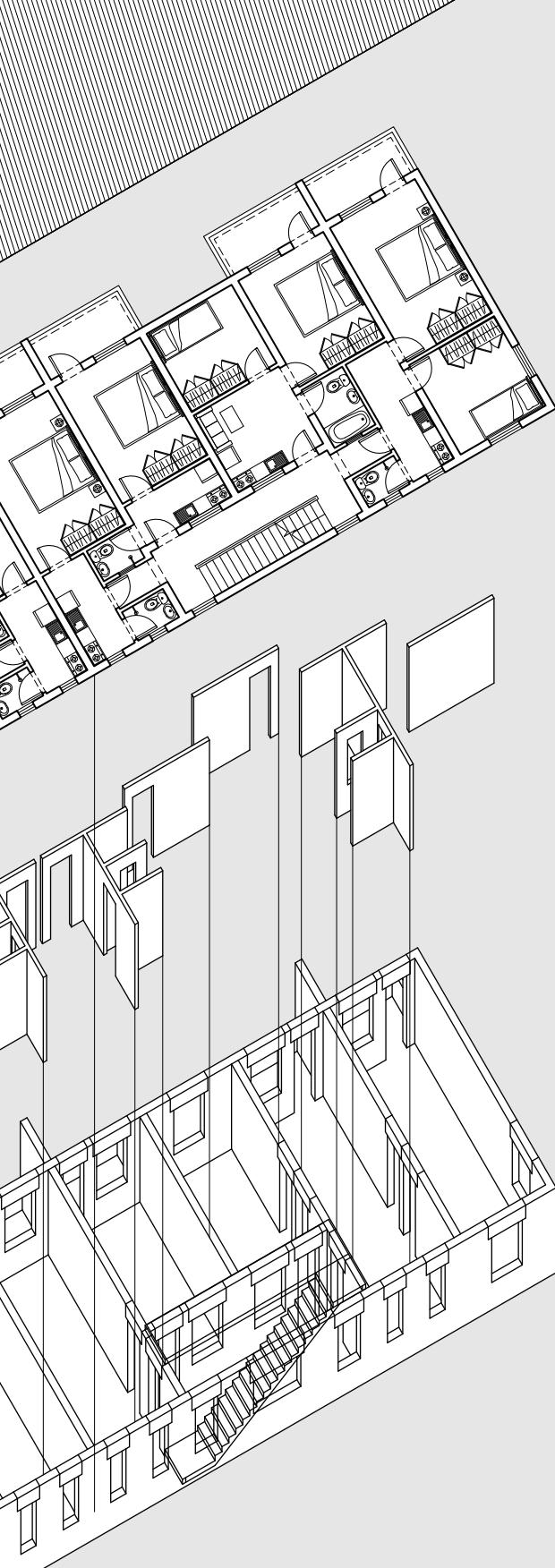




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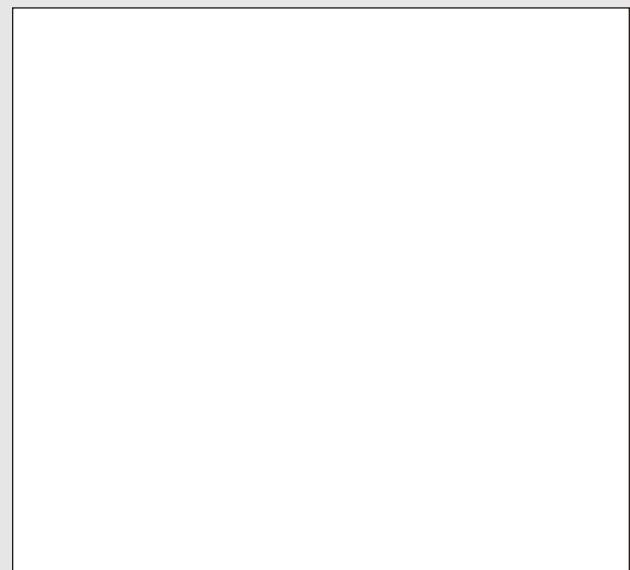
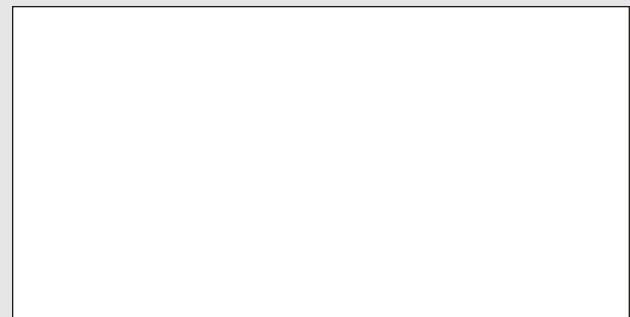
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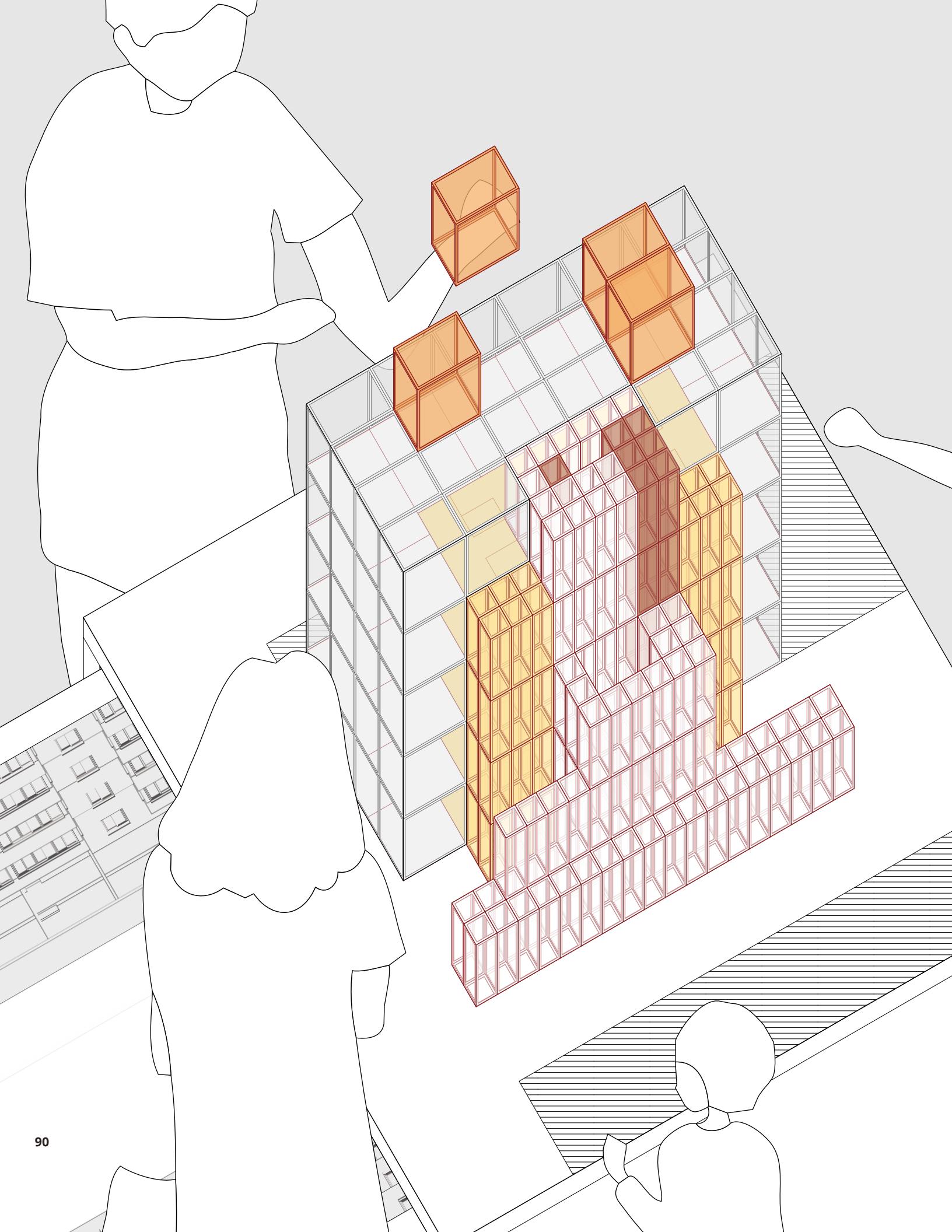


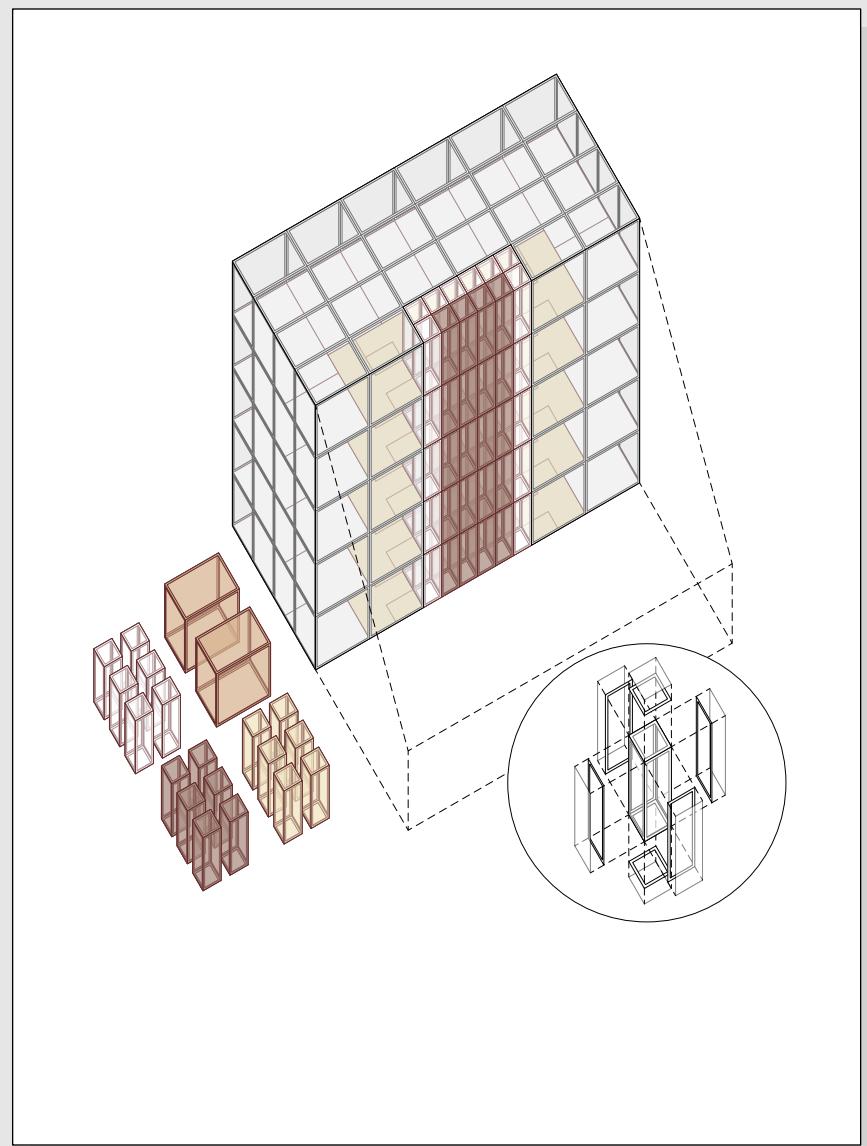
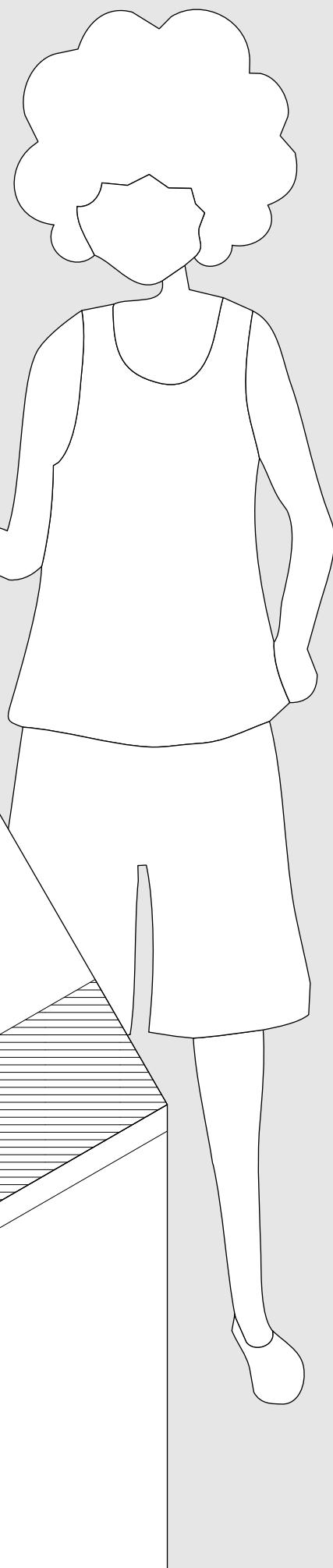


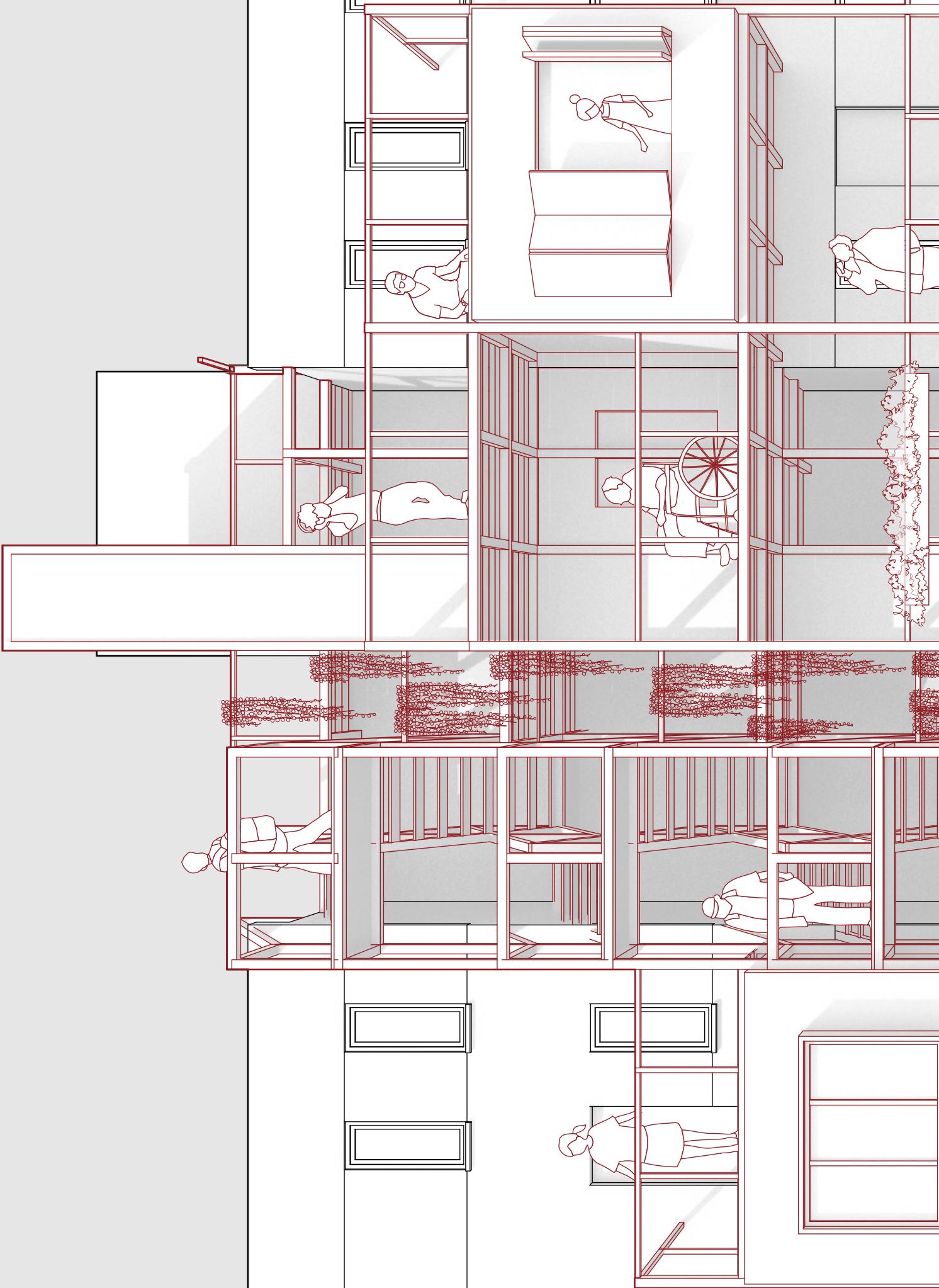
slope roof.

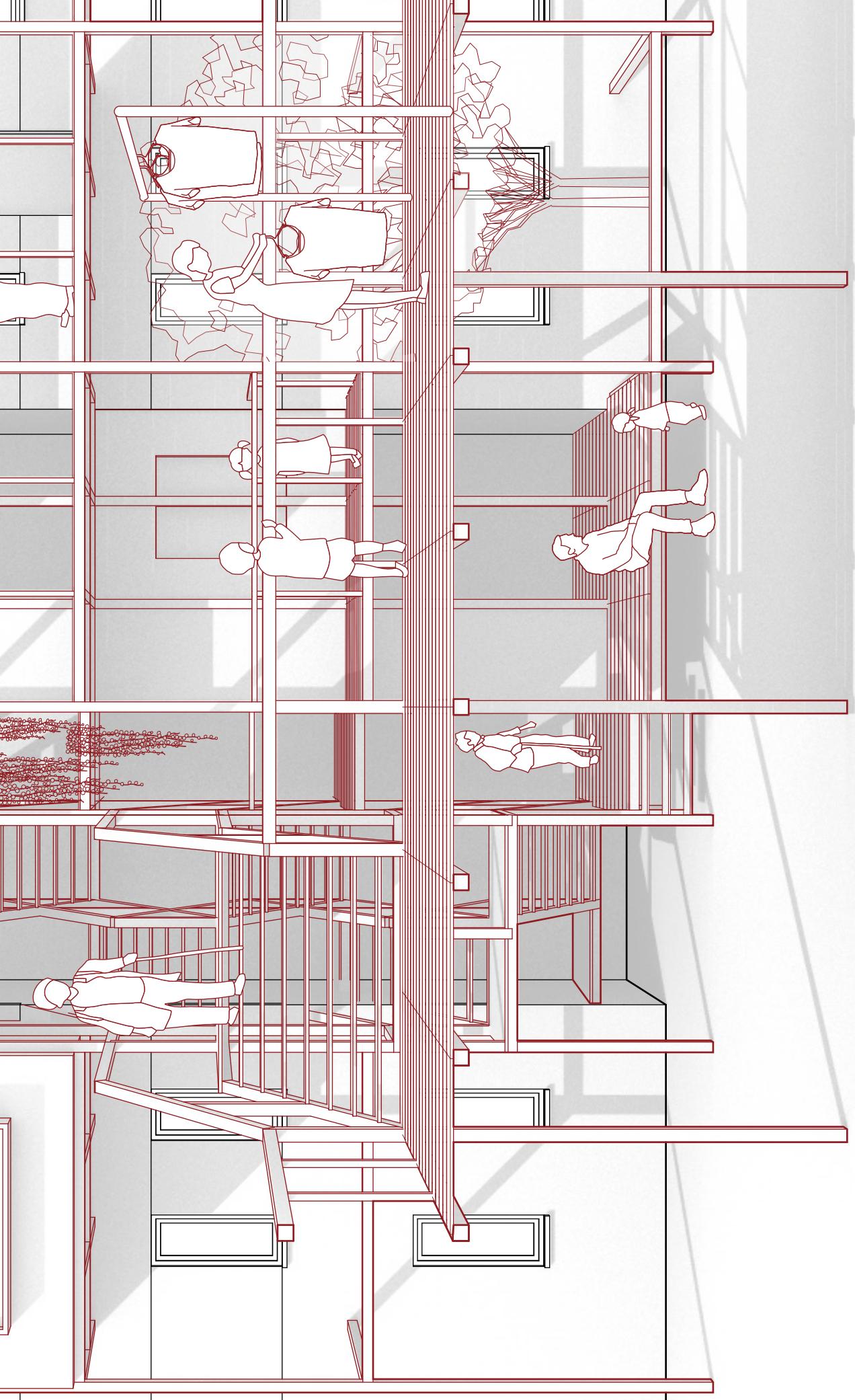
in the 2000s, shanghai city added slope roof structures to the flat roofed residential buildings to improve thermal comfort.





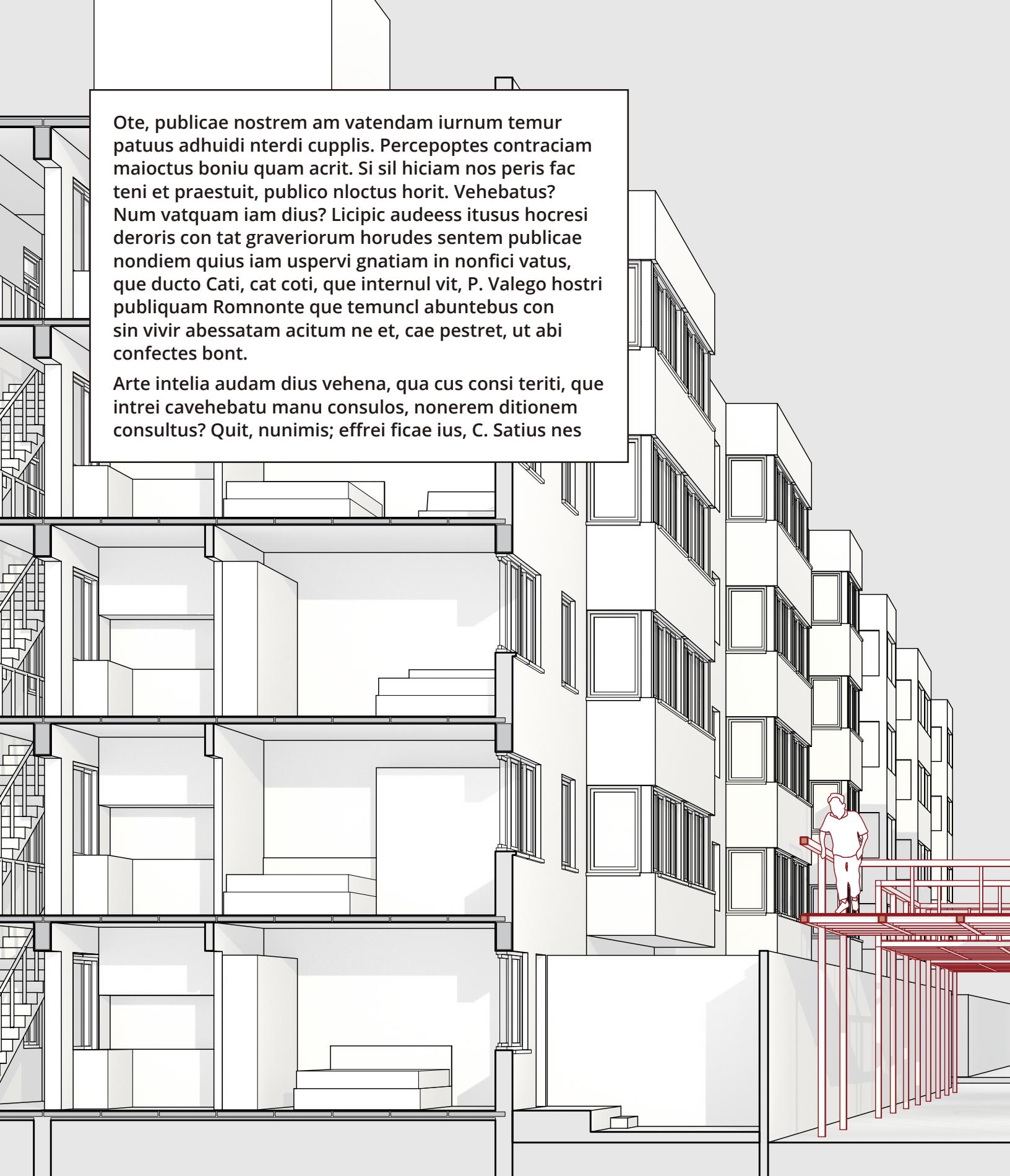


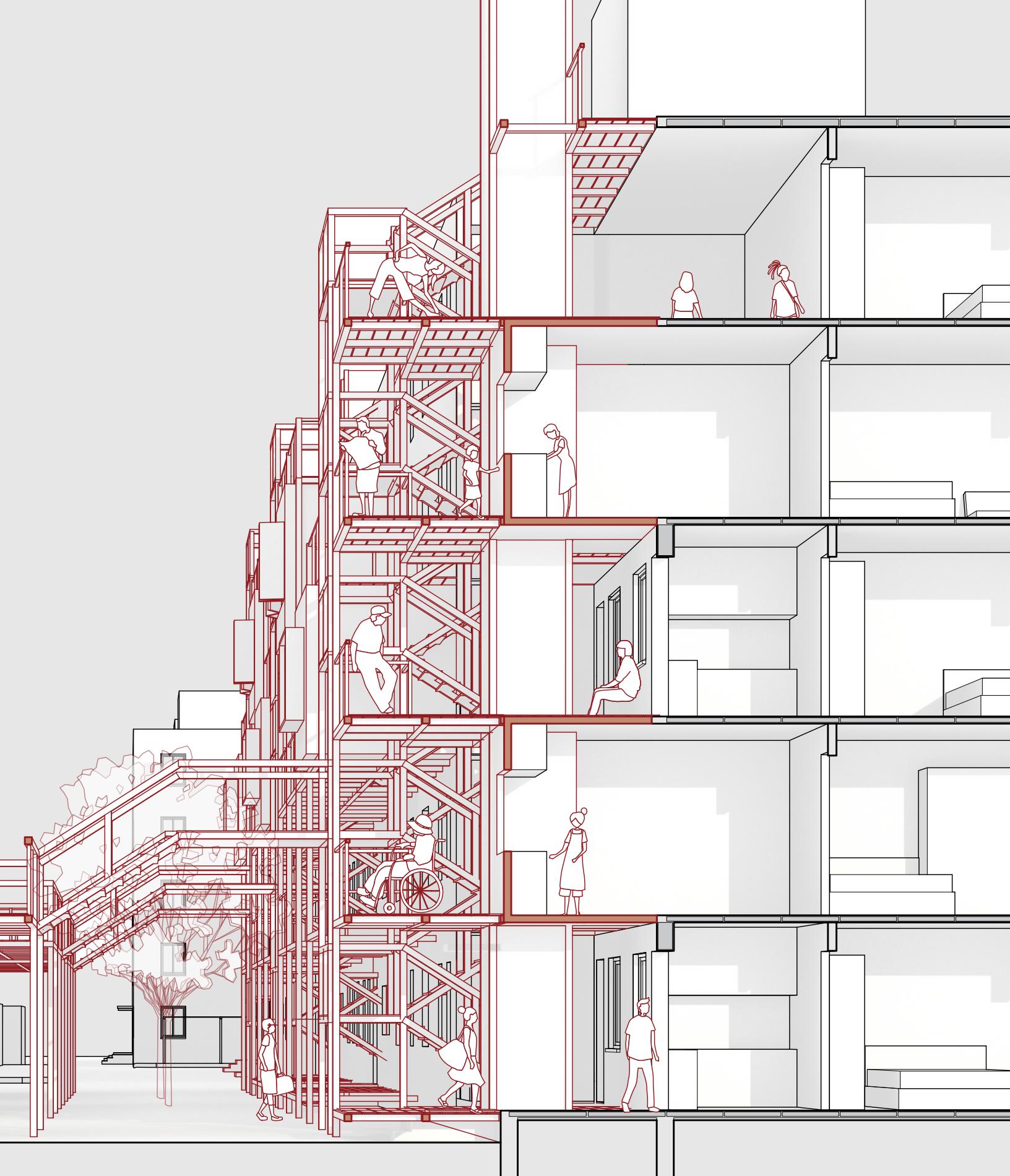


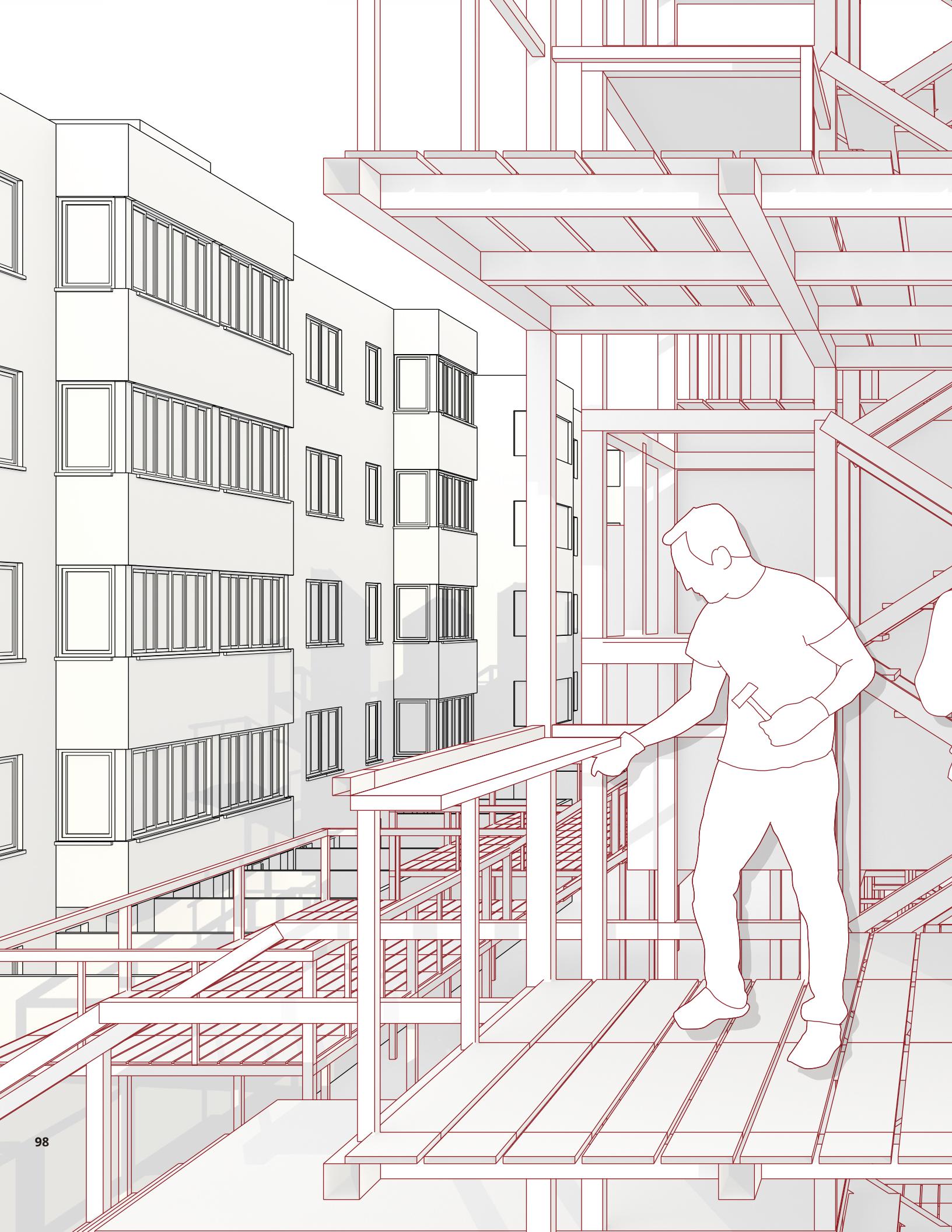


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REFERENCES

