

HOW TO TAILOR 50-STORY OFFICE

A Thesis Submitted to the Department of Architecture
Harvard University Graduate School of Design, by

JIYOON LEE

In Partial Fulfillment of the Requirements for the Degree of
[Master of Architecture]

DECEMBER 2023

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A handwritten signature in cursive script that reads "jiyoon lee". The signature is written in black ink and is positioned above a horizontal line.

Jiyoon Lee

A handwritten signature in a stylized, blocky script that reads "Eric Höweler". The signature is written in black ink and is positioned above a horizontal line.

Eric Höweler

How to Tailor 50-Story Office

Harvard University, GSD
Master of Architecture I Thesis

STUDENT: Jiyoung Lee
ADVISOR: Eric Höweler

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The escalating office vacancy rates in urban environments have emerged as a prominent issue, significantly impacting both the real estate market and the urban landscape. It became visible that the pervasive presence of vacant office spaces not only undermines the vitality of cityscapes but also results in desolate streets, empty store fronts, and underutilized public spaces- everyday spaces that we inhabit.

However, the challenges are not new. In response to this ongoing vacancy crisis, various attempts have sought to re-purpose office buildings for other uses, particularly- housing. Learning from the converted examples, it is evident that the adaptive conversions predominantly target buildings that exhibit inherent adaptability and a conduciveness for transformation. These building forms often possess optional access to natural ventilation and daylight, key considerations for conversion to residential architecture.

Nonetheless, it is evident that there is a significant shift in the evolution of office plans. Notable office buildings, such as the Wainwright Building (1890s), the Chrysler Building (1930s), the Seagram Building (1950s), and the Shenzhen Stock Exchange Building (2010s), demonstrate that office plans have evolved from adaptable and malleable plans to highly specific entities optimized to maximize productivity in alignment with technological advancements and changes in business practices.

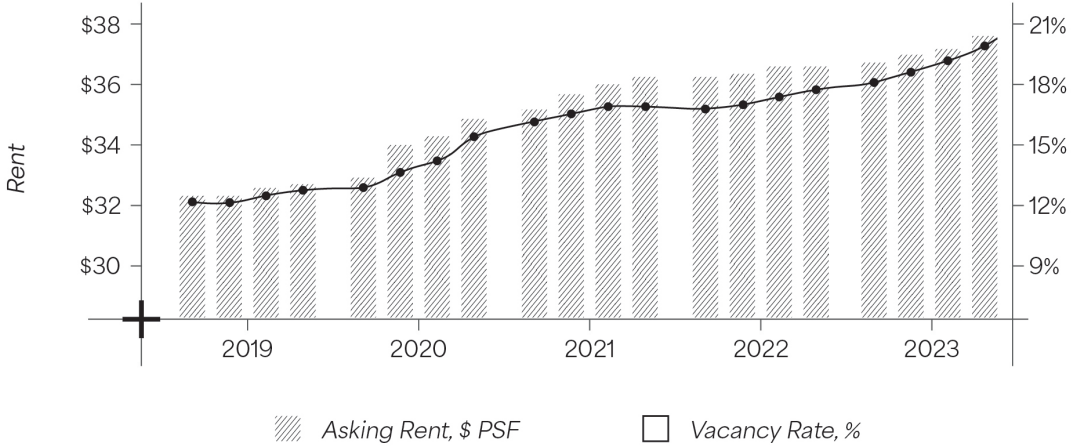
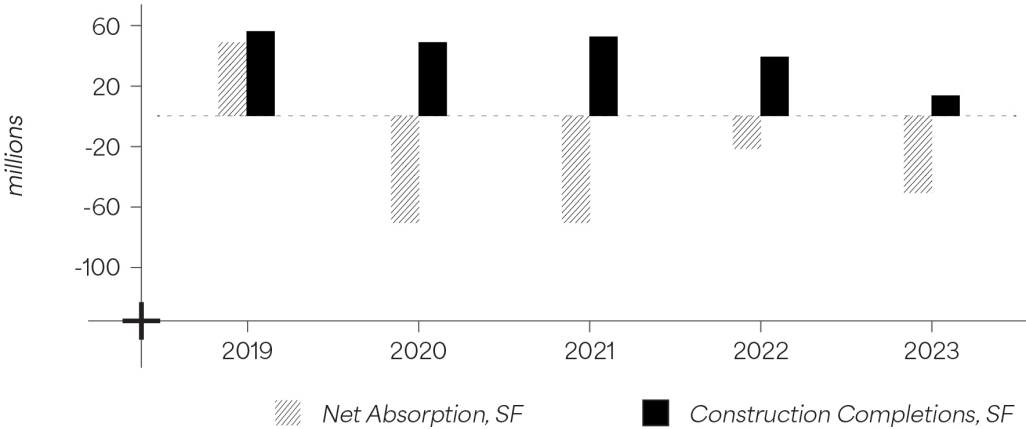
However, when these highly specific machines eventually become obsolete, how do we envision an alternative future for these modern office buildings? This prompts the central exploration of the thesis project. This project explores ways to undo the specificity and alter, to not only address the vacancy crisis but also to redefine and reactivate the urban neighborhood.

Adaptive reuse is a commonly cited strategy to address office vacancy issues and housing crisis.

The advent of the COVID-19 pandemic has introduced unforeseen challenges, triggering a swift transformation in office working patterns and the decentralization of urban core activities. The enduring impact of this shift on the demand for office spaces within urban cores remains uncertain, raising the need for adaptable strategies and policies to address escalating vacancy rates. While acknowledging that adaptive reuse projects typically involve intricate processes, including rigorous assessments, complex planning approvals, and compliance with building regulations, this project aims to underscore the potential advantages of re-purposing these spaces into residential units. The primary goal is not only to breathe life into vacant buildings but also to cultivate dynamic urban landscapes within the surrounding neighborhoods.

Office Vacancy Rate

United States



Source: BLS, Cushman & Wakefield



“There are only passers-by these days and lots of empty store-fronts. Downtown streets also are quiet, leaving plenty of room for homeless people, crimes, police and the occasional tourist. “It’s spooky,””

WSJ- America’s Downtowns Are Empty. Fixing Them Will Be Expensive (Putzier,2023)

OFFICE > RESIDENTIAL CONVERTED
PRECEDENTS



A
[49 Chambers]
Location
51 Chambers St.,
Manhattan, New York
Year
1912 (2017)
Program:
Office > Residential



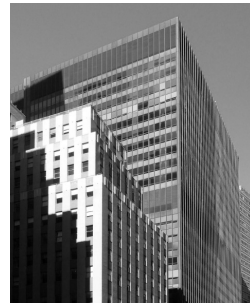
B
[The Reynolds Building]
Location
51 E. 4th St., Winston-Salem,
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C
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D
[The Arden]
Location
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E
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I
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J
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Location
Quai aux Pierres de Taille
16/281000 Bruxelles, Belgium
Year
1960 (2019)
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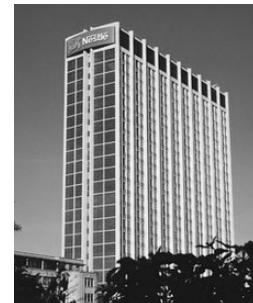
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-1940s

1950s

1960s

1970s



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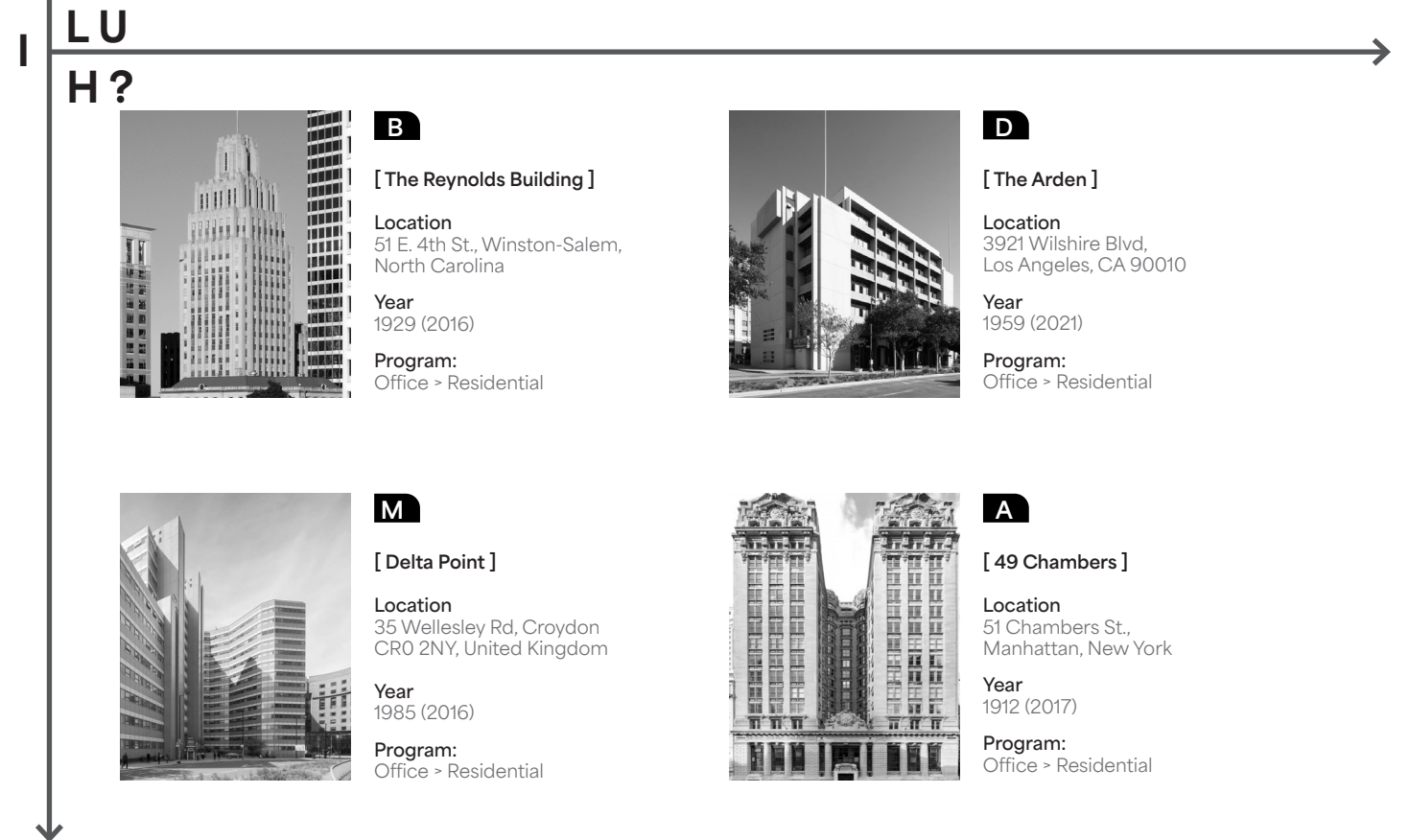
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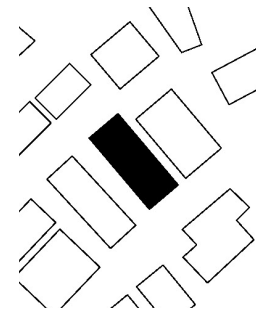


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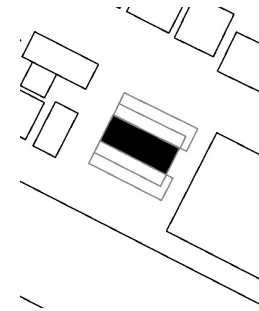


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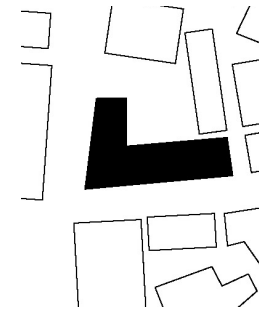
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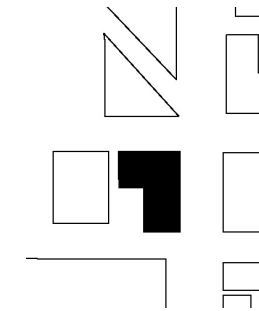
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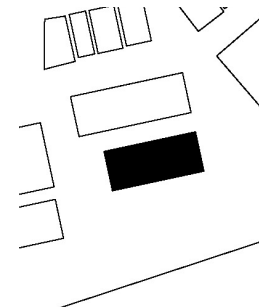
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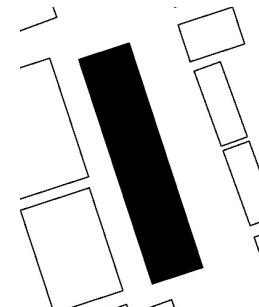
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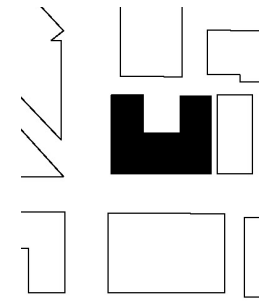
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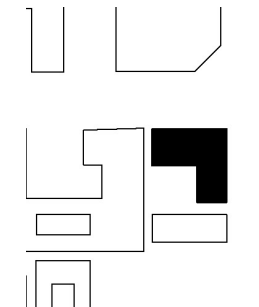
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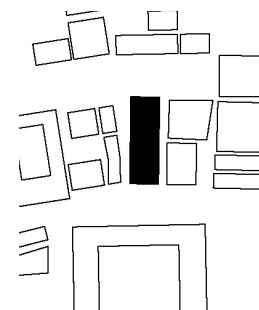
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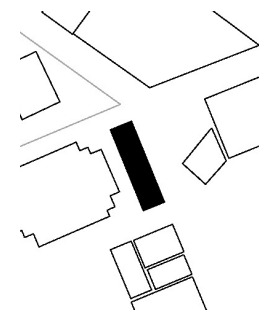
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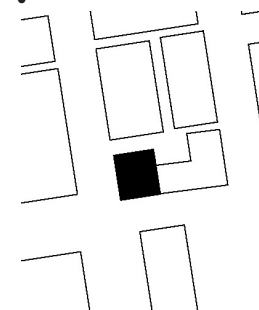
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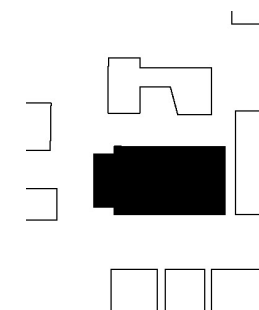
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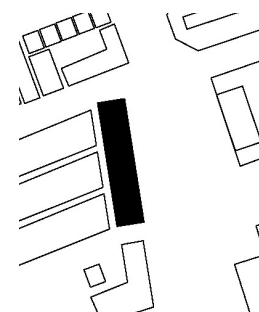
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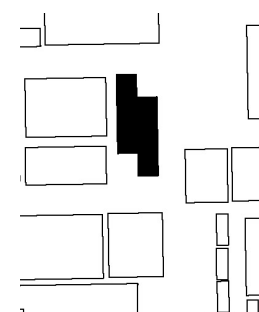
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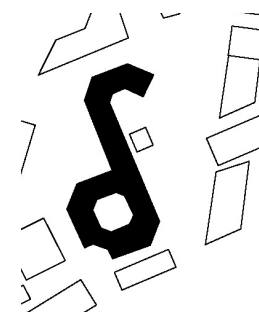
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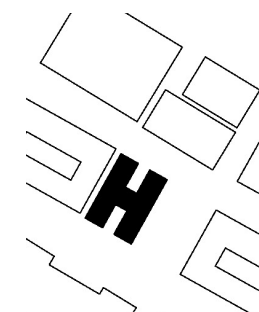
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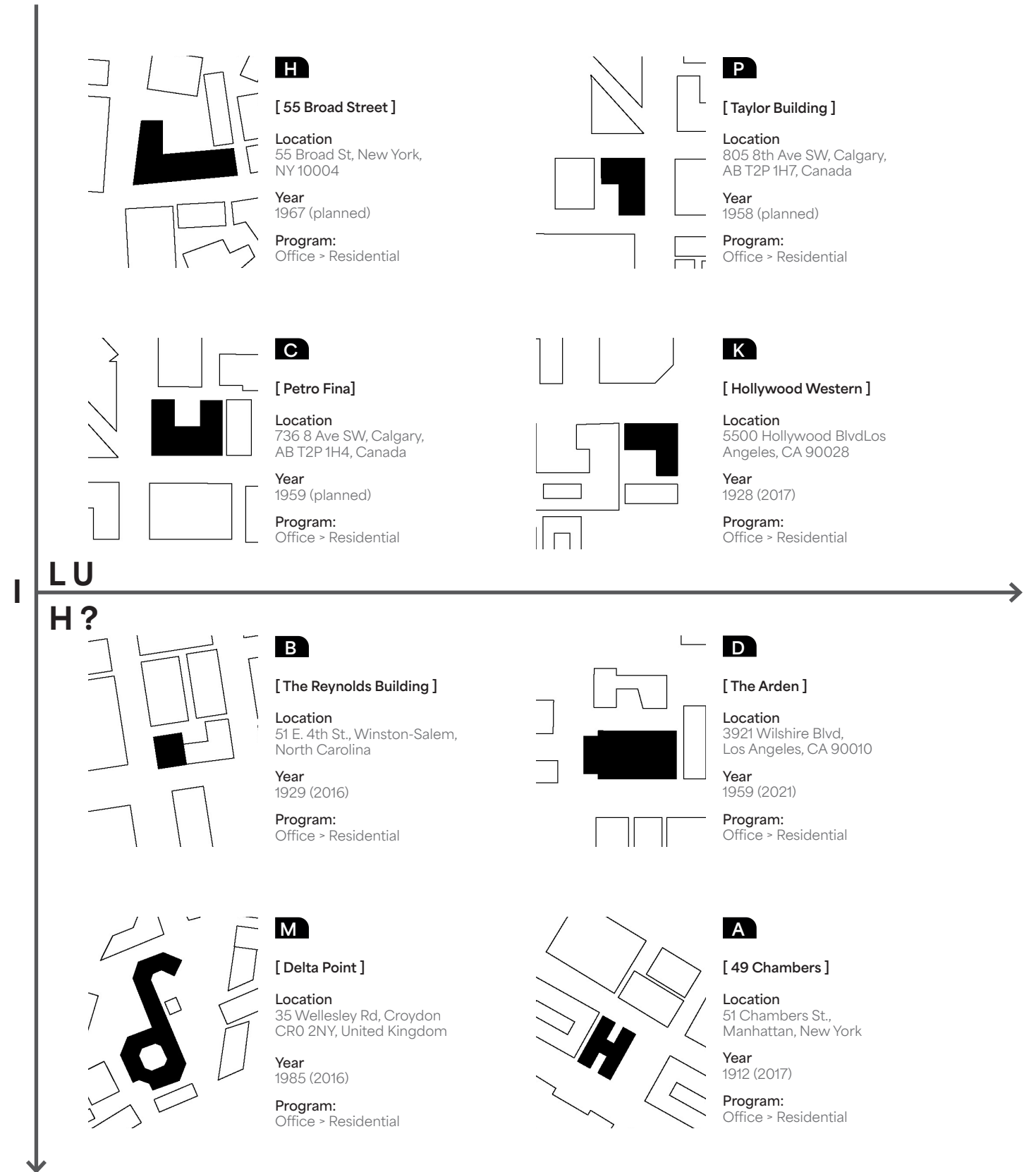
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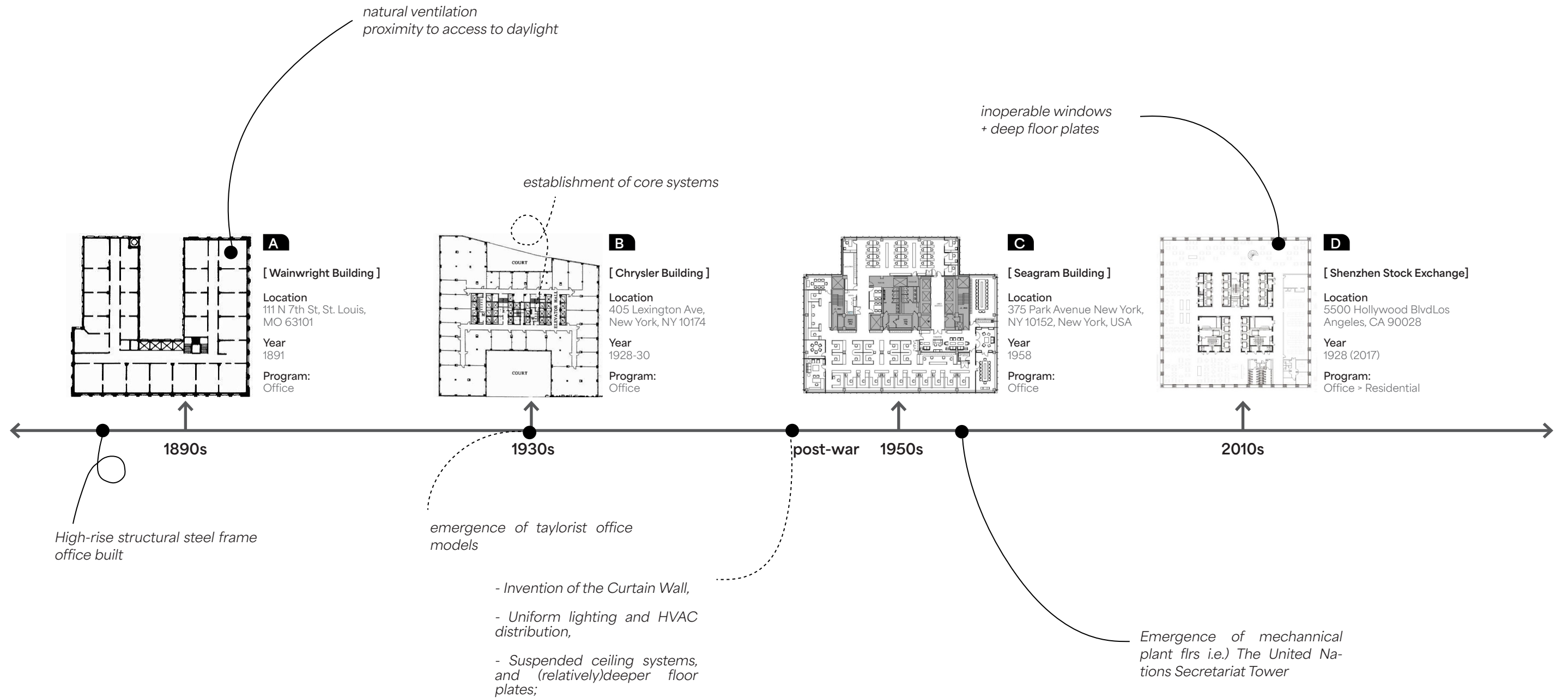
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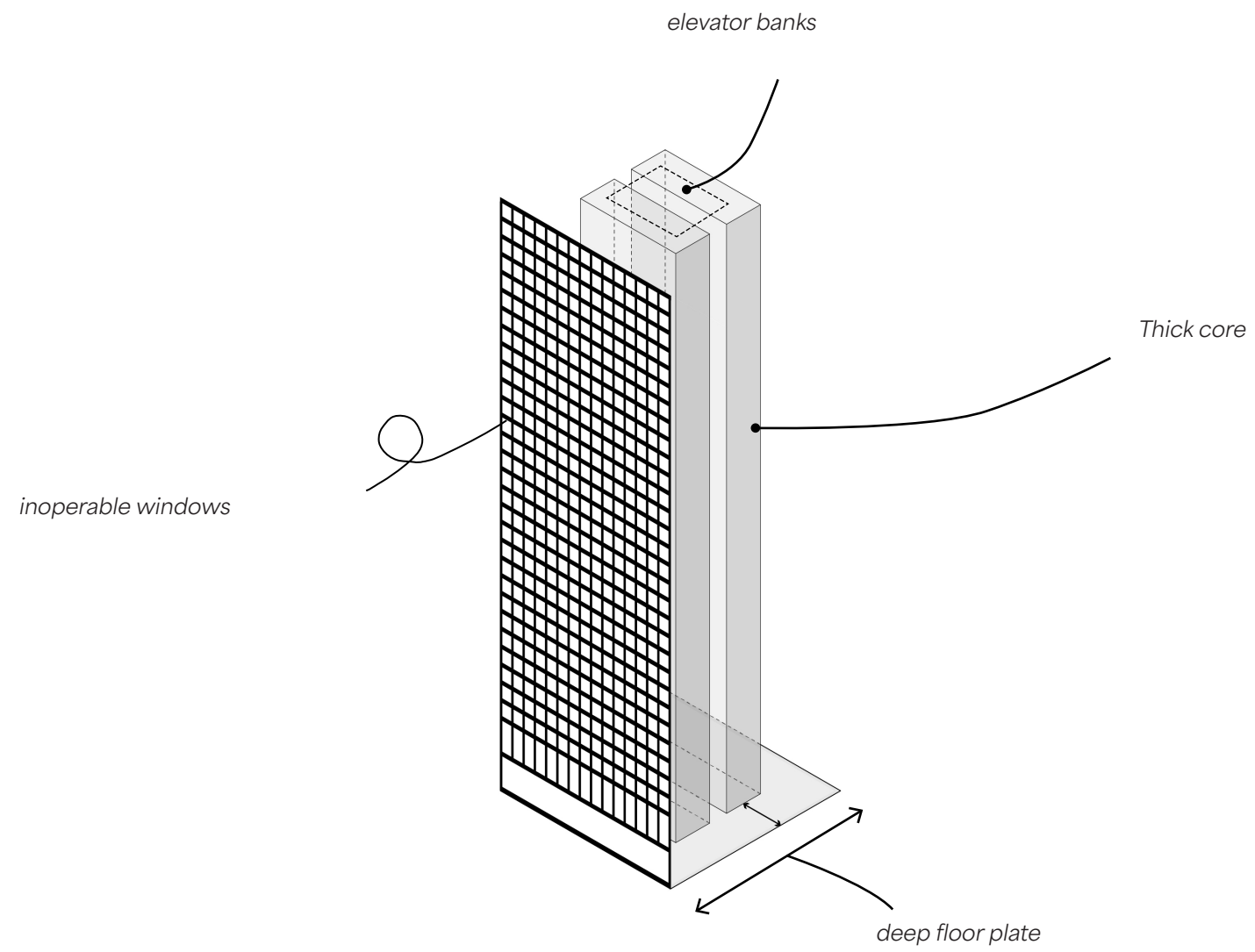


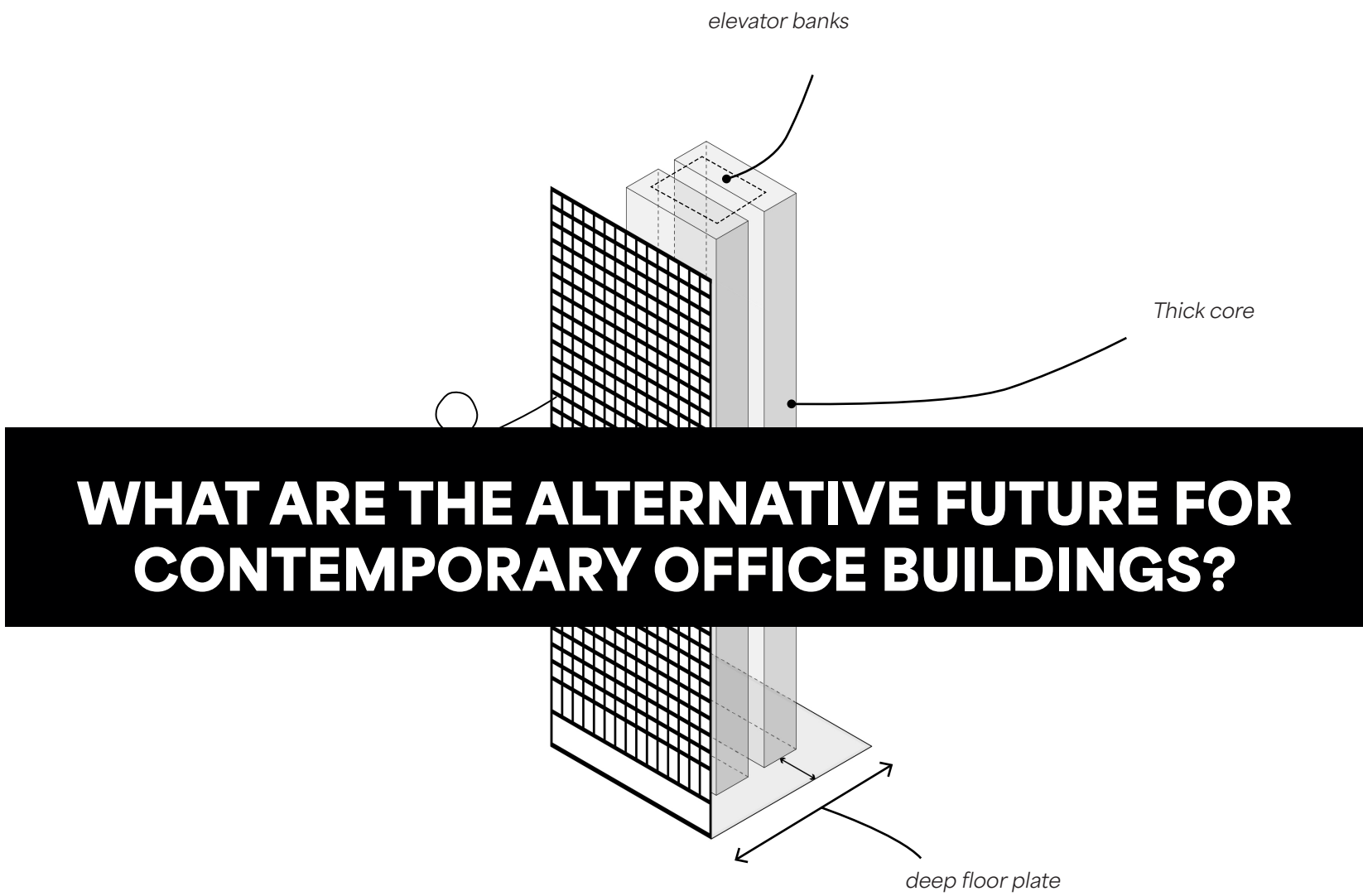
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TIMELINE OF OFFICE DEVELOPMENT
PRECEDENTS







SITE

DEVELOPMENT OF CANARY WHARF
HISTORY

► 1981

The London Docklands Development Corporation (LDDC) was formed.

► 1987

Acquired funding from Canadian property tycoon Paul Reichmann's company Olympia & York.

► 1988

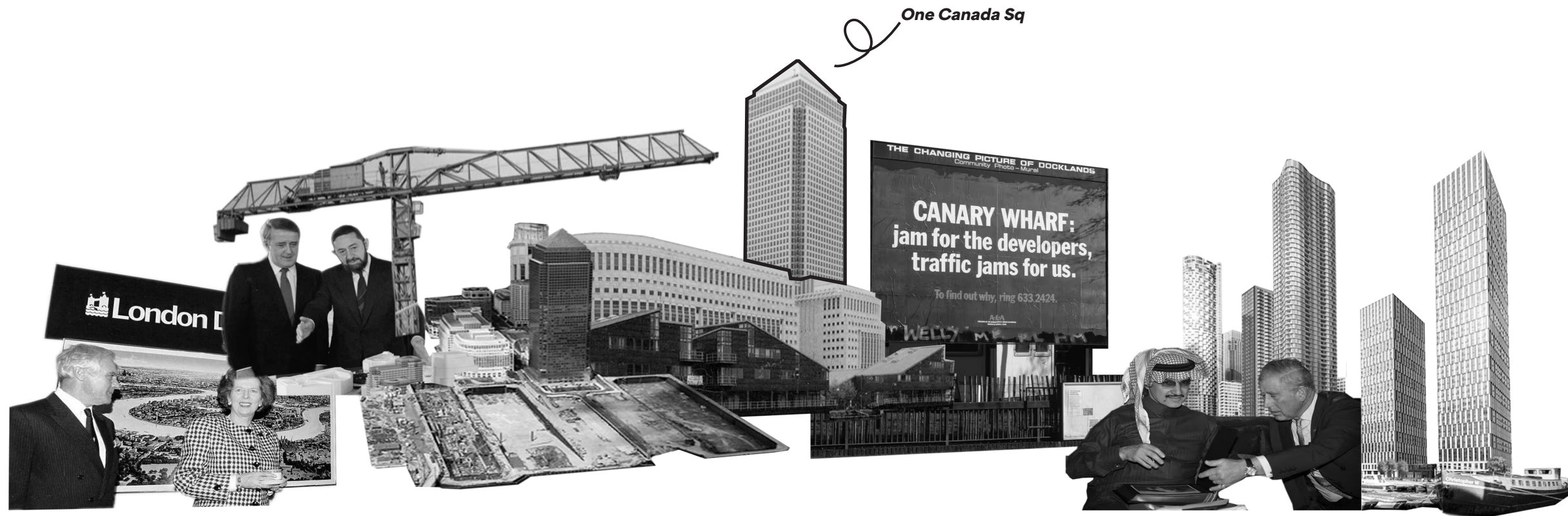
Construction began.

► 1990

First building (One Canada Square) was completed. It was the tallest building in the country until the Shard was built in 2010.

► 1991

First group of tenants (Citigroup, Morgan Stanley, and HSBC etc) moved in.



► 1992

Following a property crash, Olympia & York filed for bankruptcy and Canary Wharf was placed in administration.

► 1995

Paul Reichmann pulled together a consortium of wealthy investors to buy Canary Wharf back from the banks for £800m.

► 1999

As the market recovered more companies moved to the Docklands, the business floated on the London stock market.

► 2004

Canary Wharf Group was acquired by Songbird Estates, a consortium led by US investment bank Morgan Stanley.

► 2009

The Qatari Investment Authority became a major Songbird shareholder.

► 2014

Canary Wharf spreads to the east calling it a new neighbourhood Wood Wharf, the first expansion of the estate since the 2008 financial crisis.

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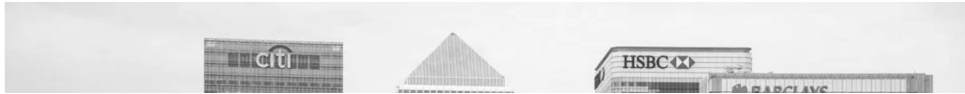
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HSBC to leave Canary Wharf tower for new world headquarters

26 June



BUSINESS

The New York Times

SQUARE FEET

With Offices Vacant, London's Canary Wharf Seeks Growth Beyond Banking

A major bank is leaving its headquarters in London's purpose-

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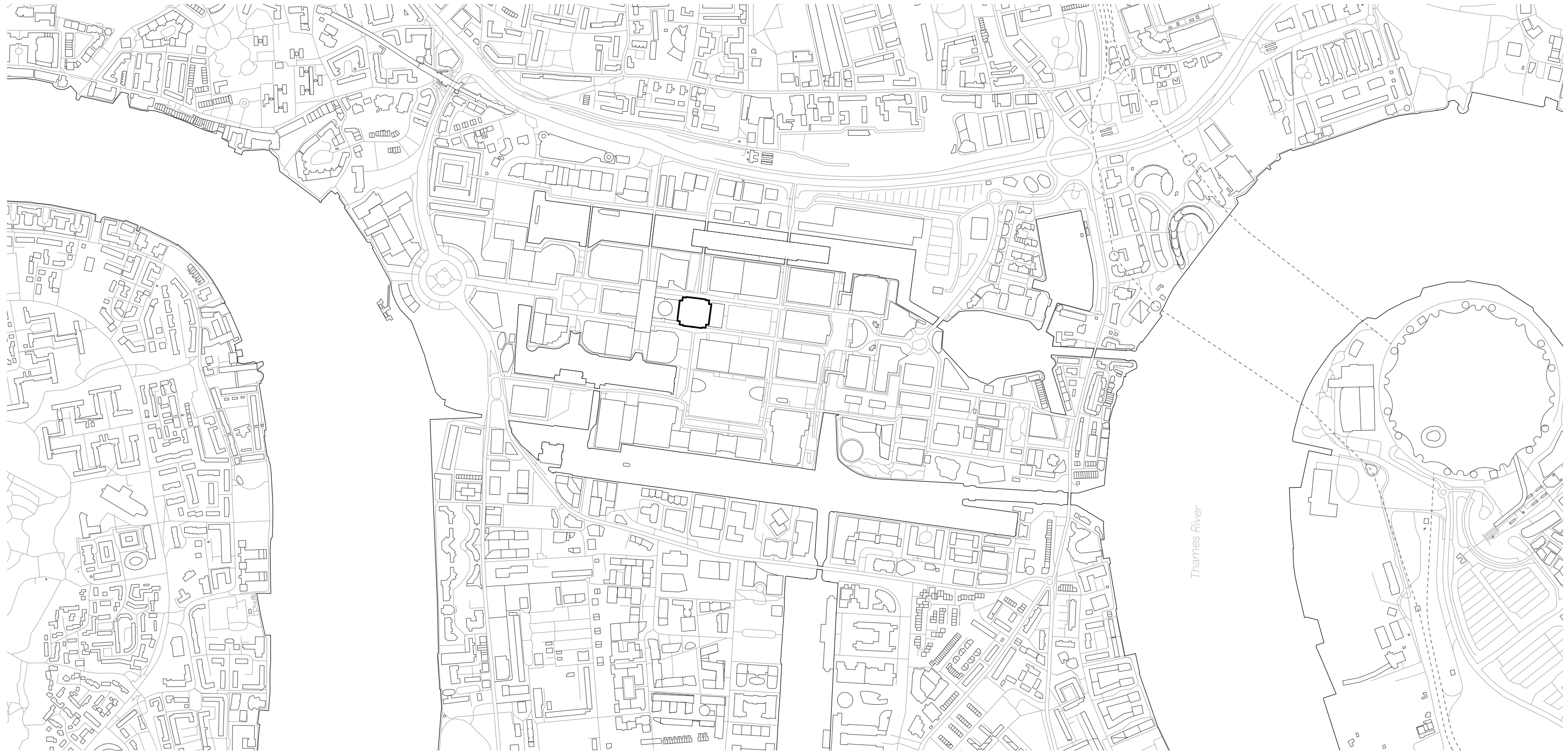
Business Economics Banking Money Markets Project Syndicate B2B Retail

'It has lost its appeal': Canary Wharf faces an uncertain future

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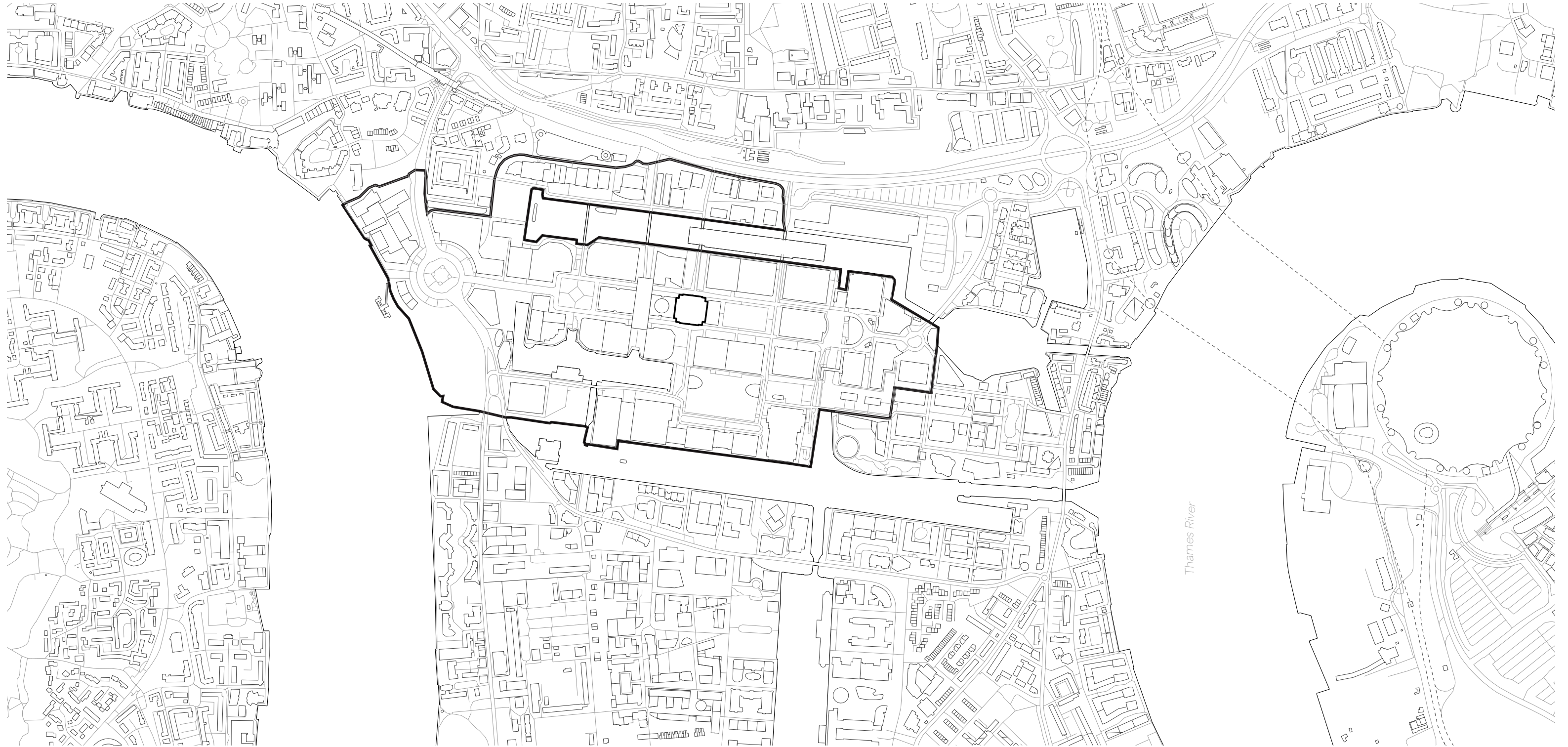
EAST LONDON



Thames River

0' 100' 300' 600' 1000' 1500'

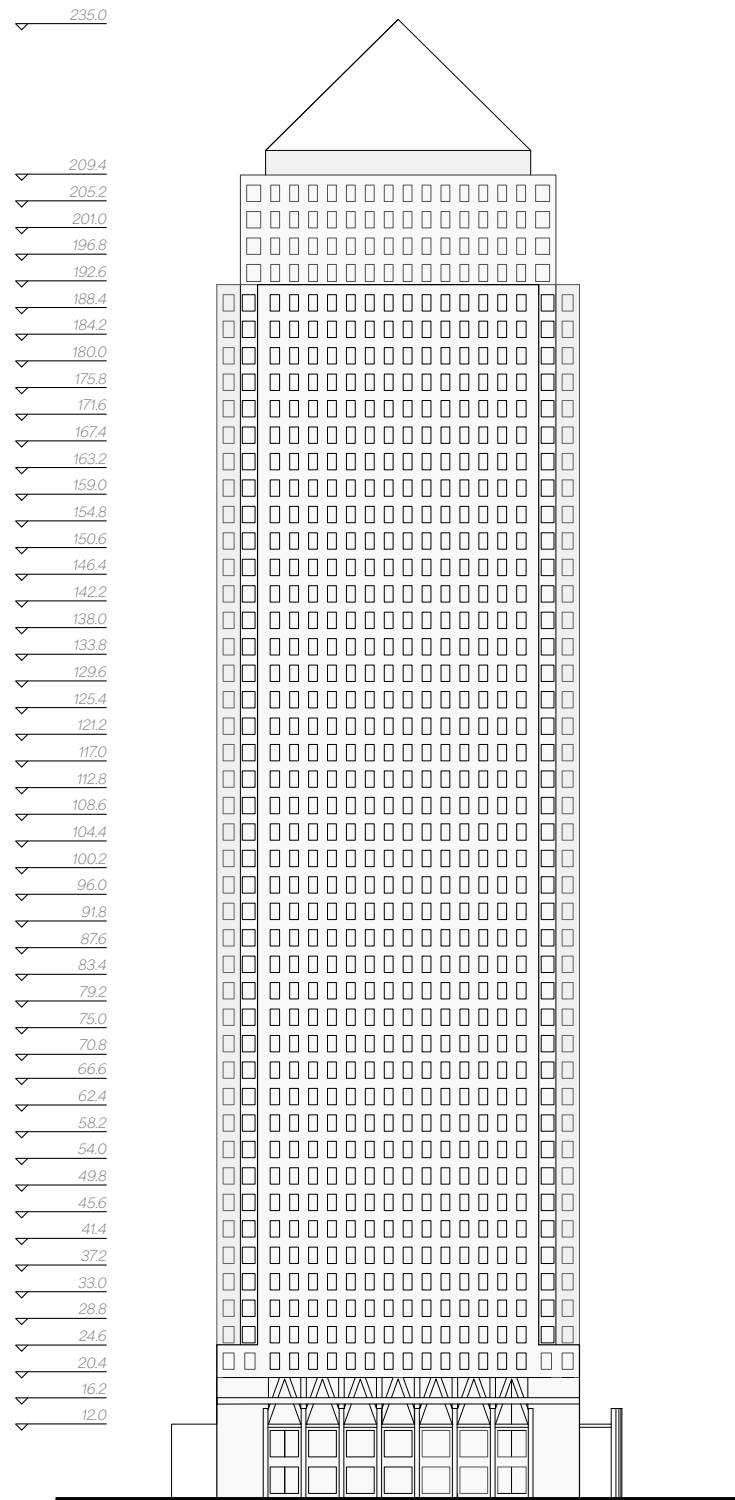
CANARY WHARF



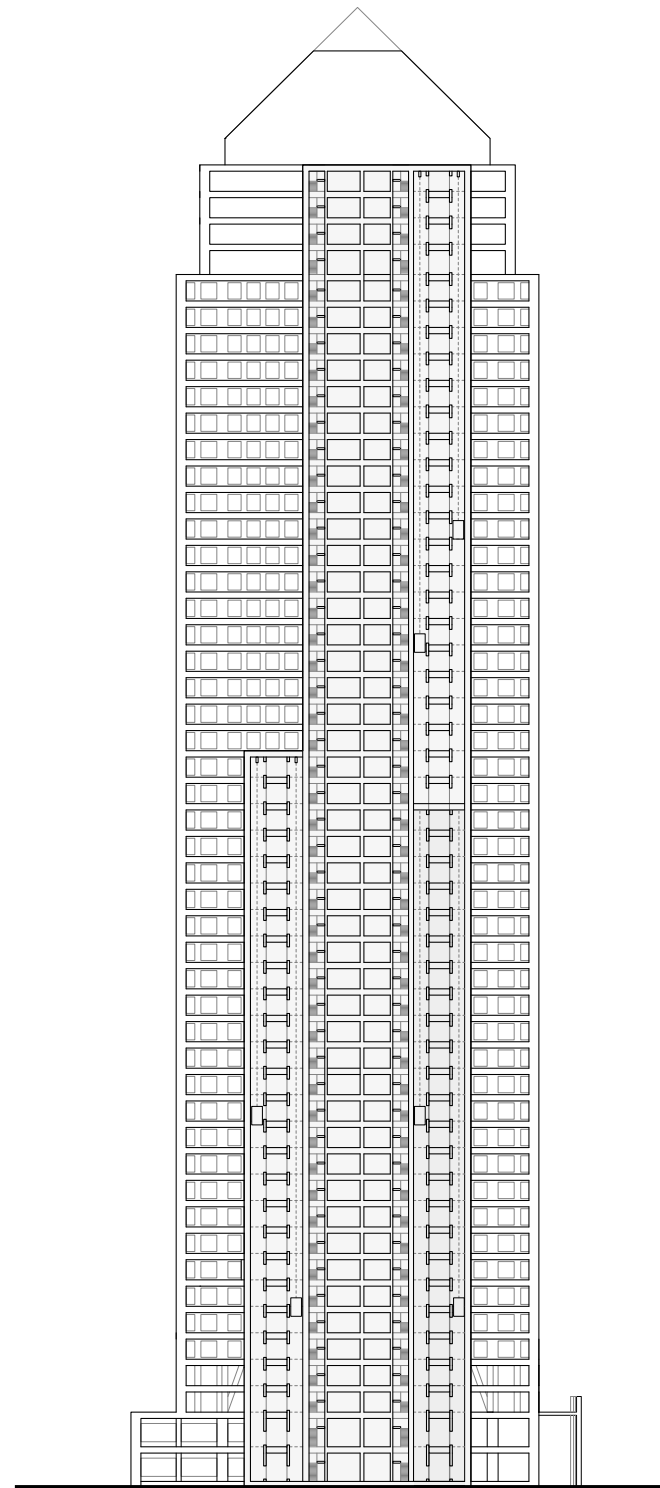
Thames River

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ONE CANADA SQ: EXISTING CONDITIONS



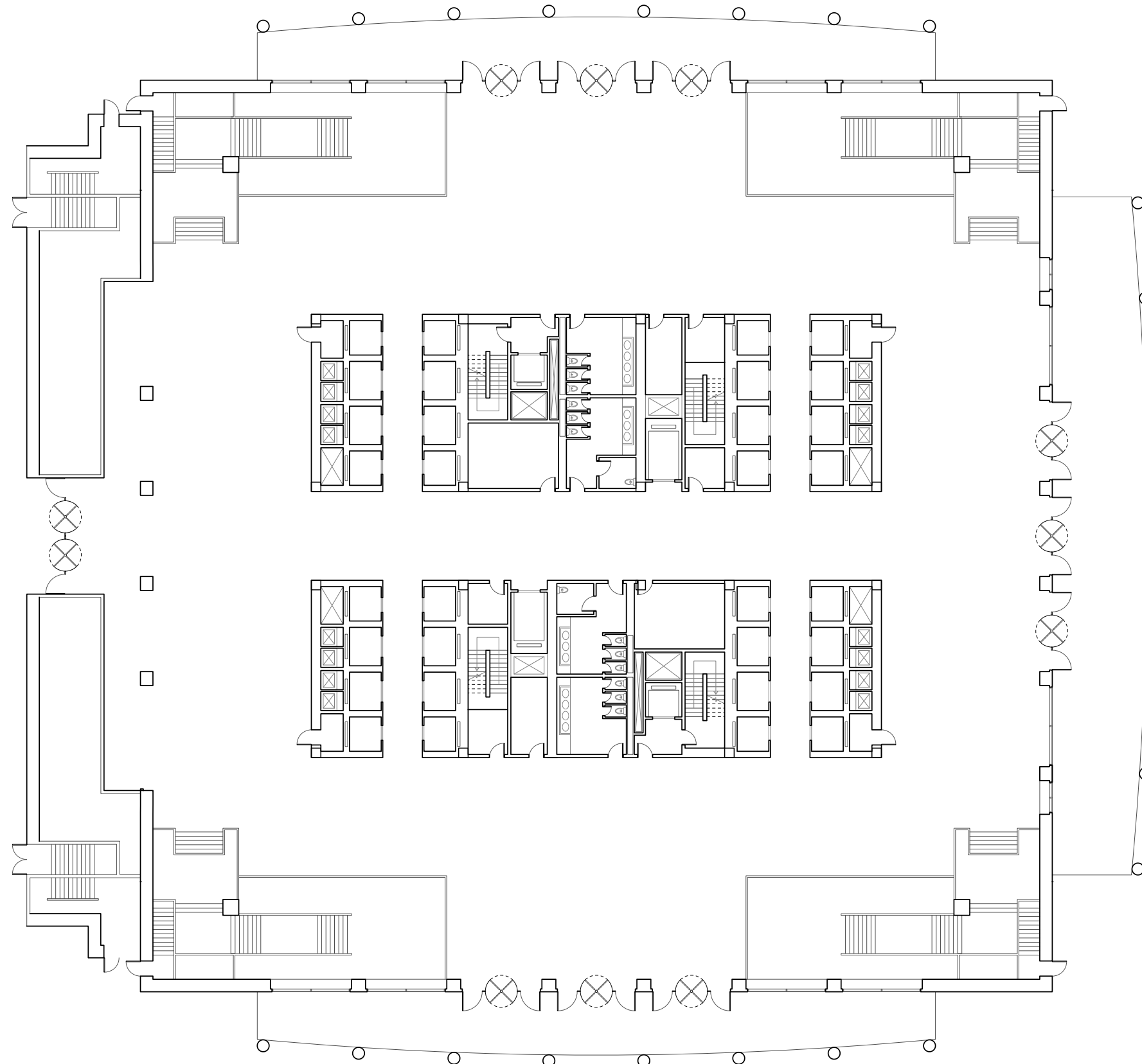
South Elevation



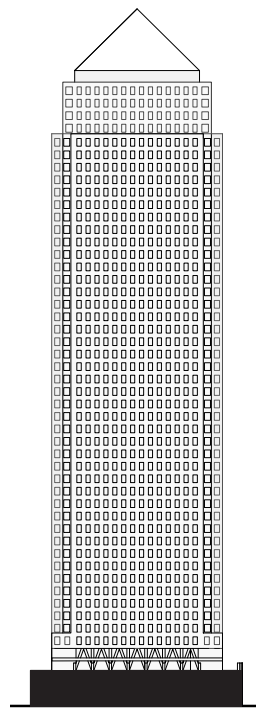
East-West Section

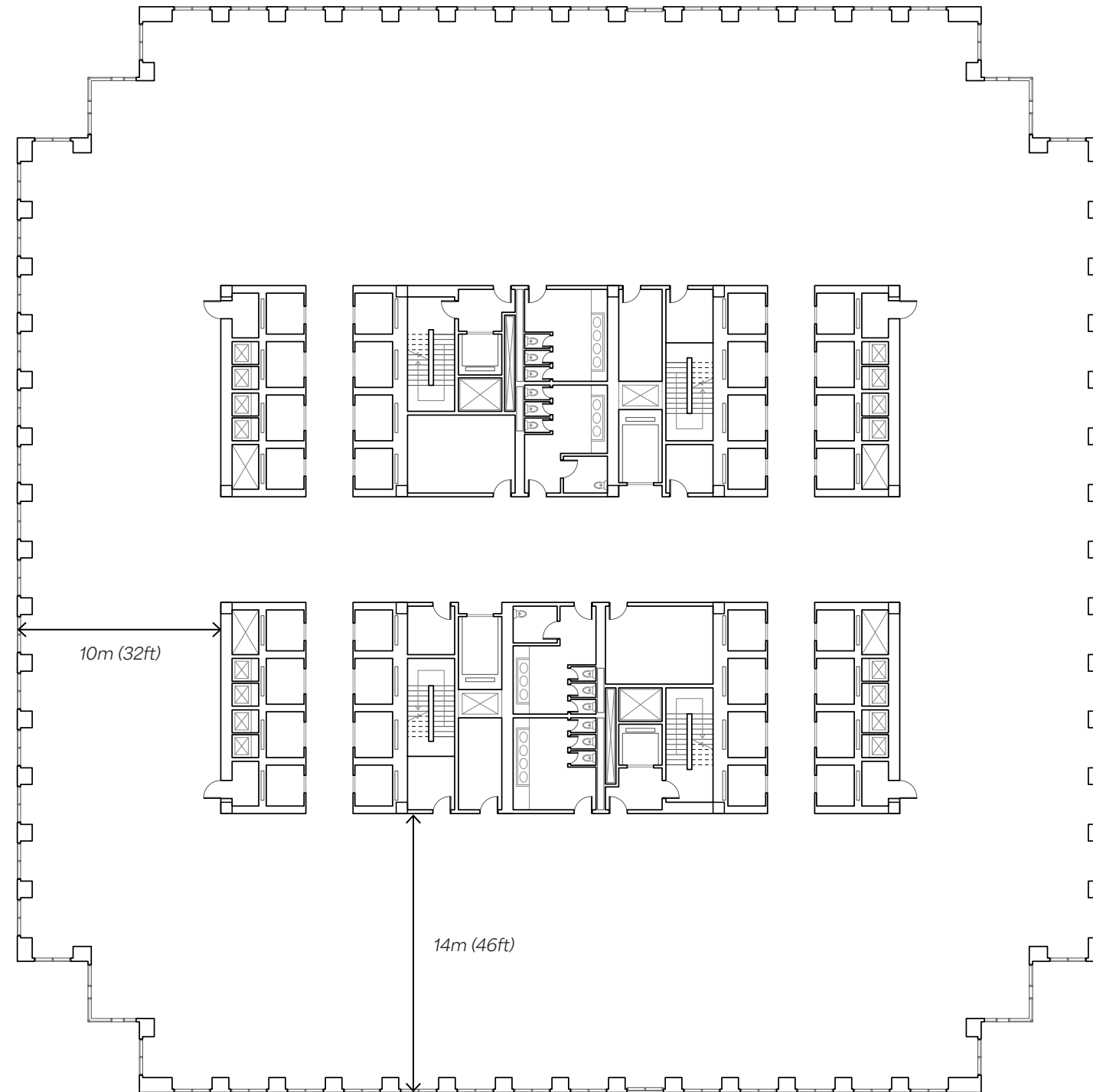
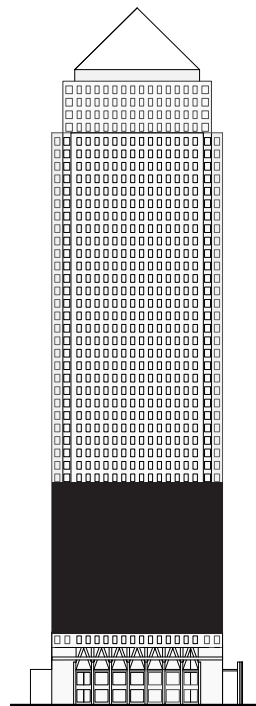


Photo from West-End



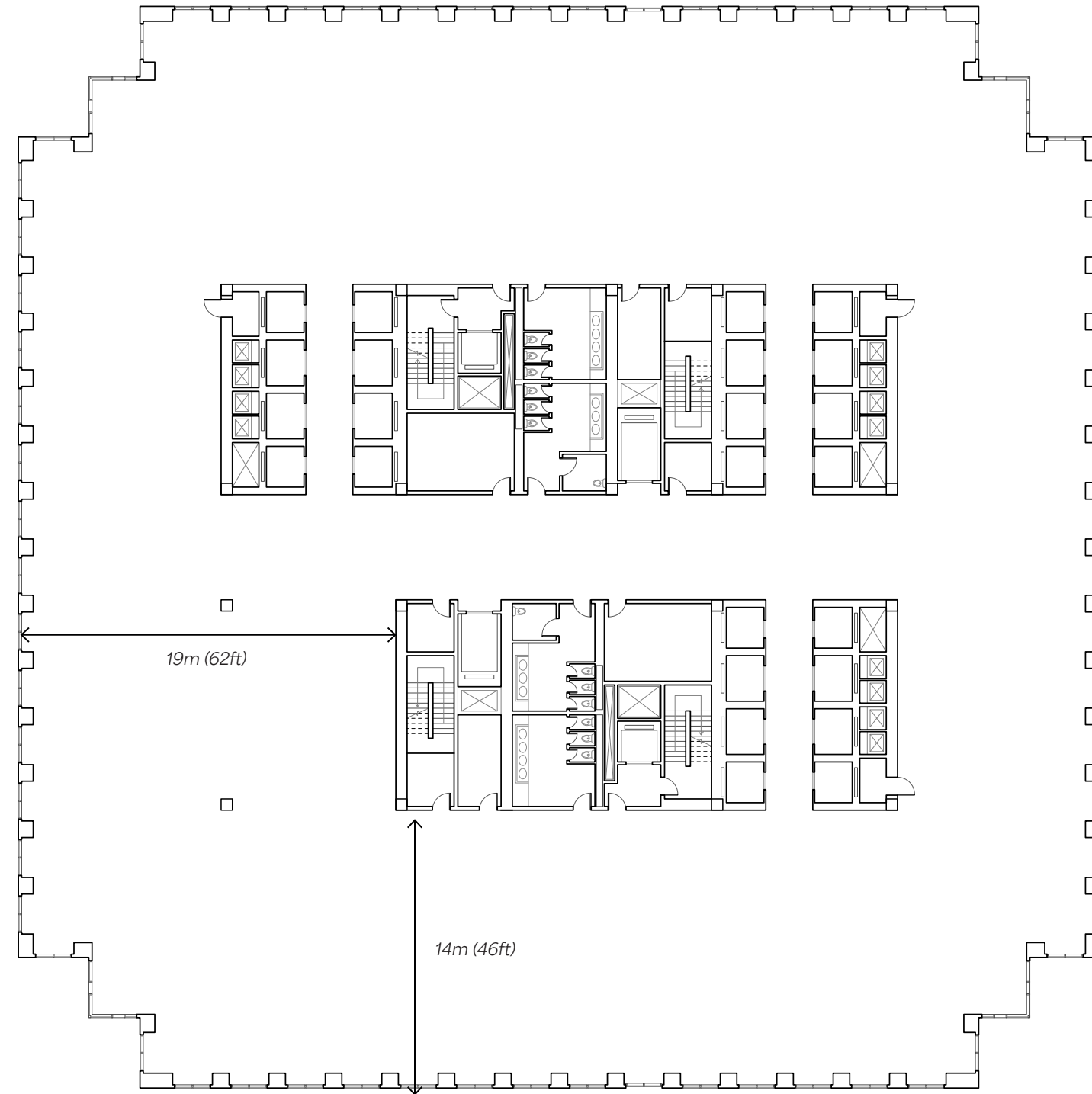
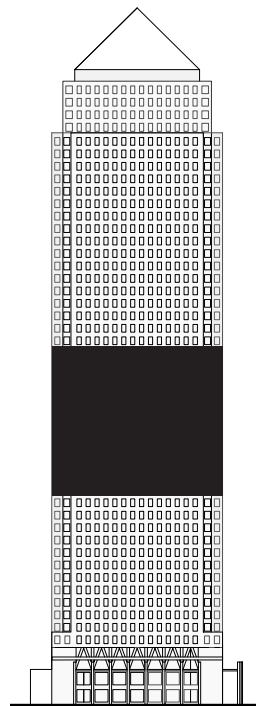
Ground Floor Plan





Typical Floor Plan [Low]
Level. 5-17

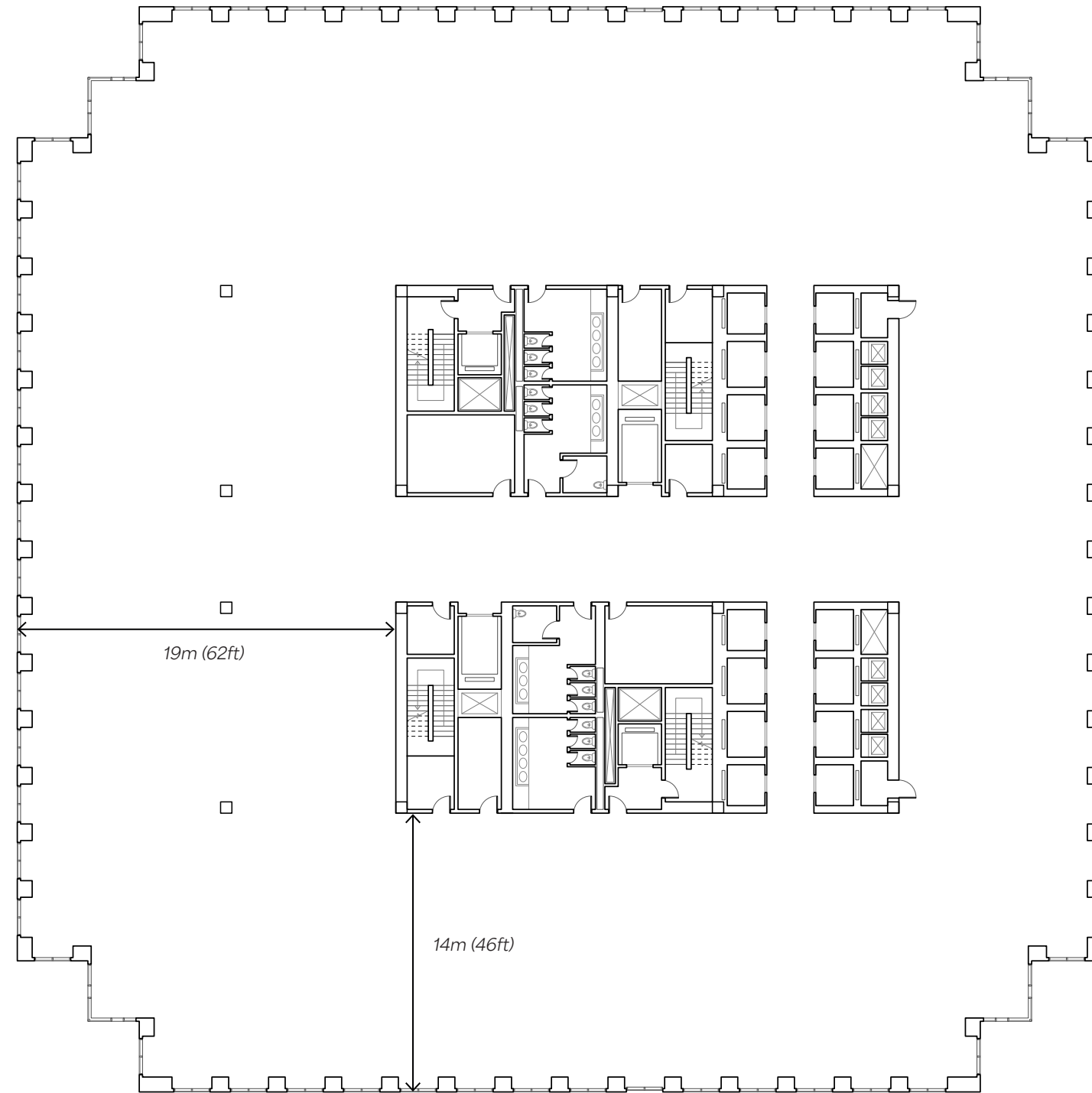
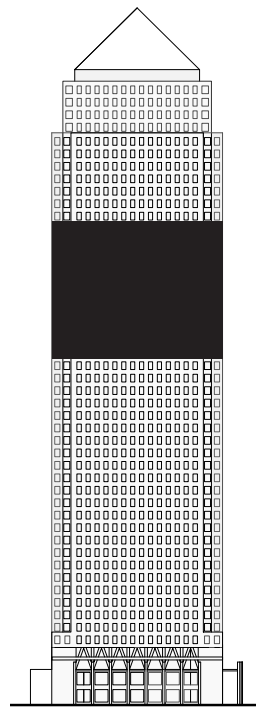




Typical Floor Plan [Mid]

Level. 17-28

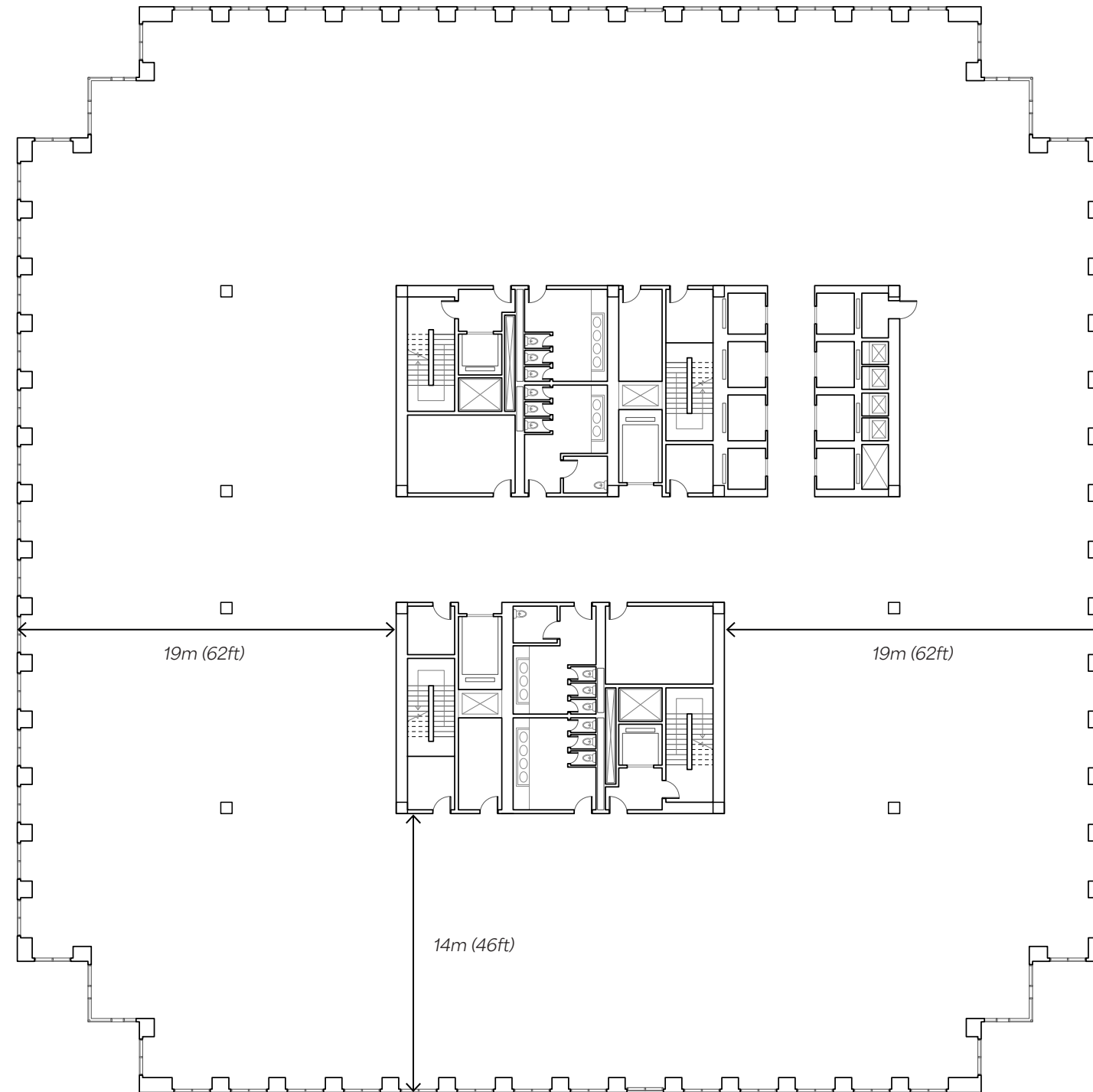
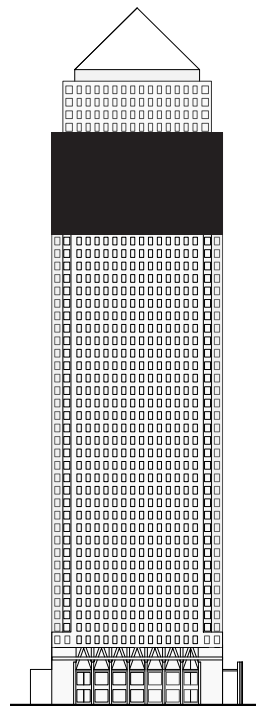




Typical Floor Plan [Mid-High]

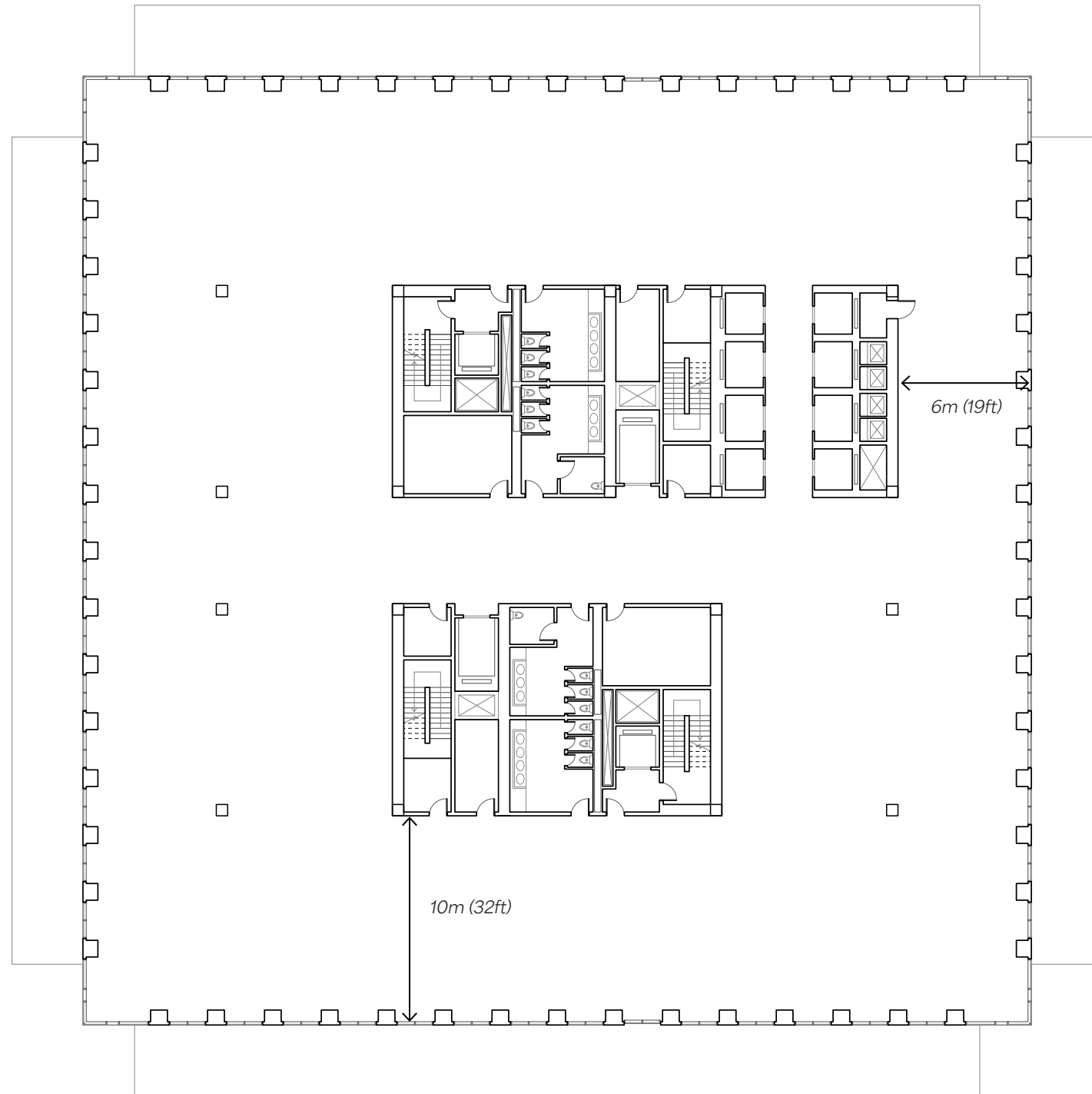
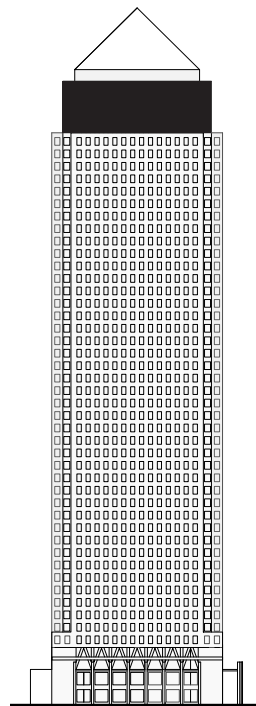
Level. 28-39





Typical Floor Plan [High]
Level. 39-46

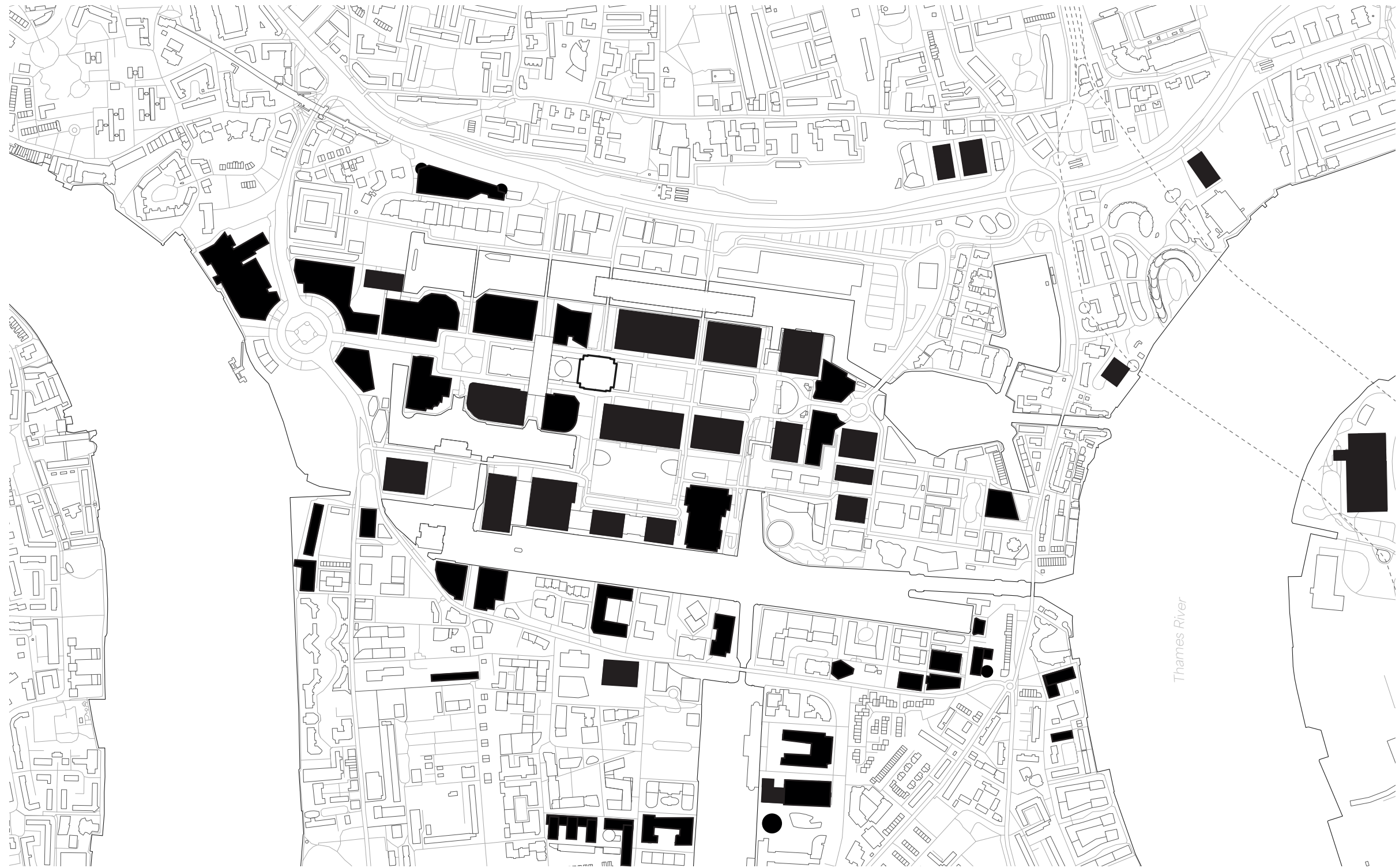




Typical Floor Plan [High]
Level. 47-50

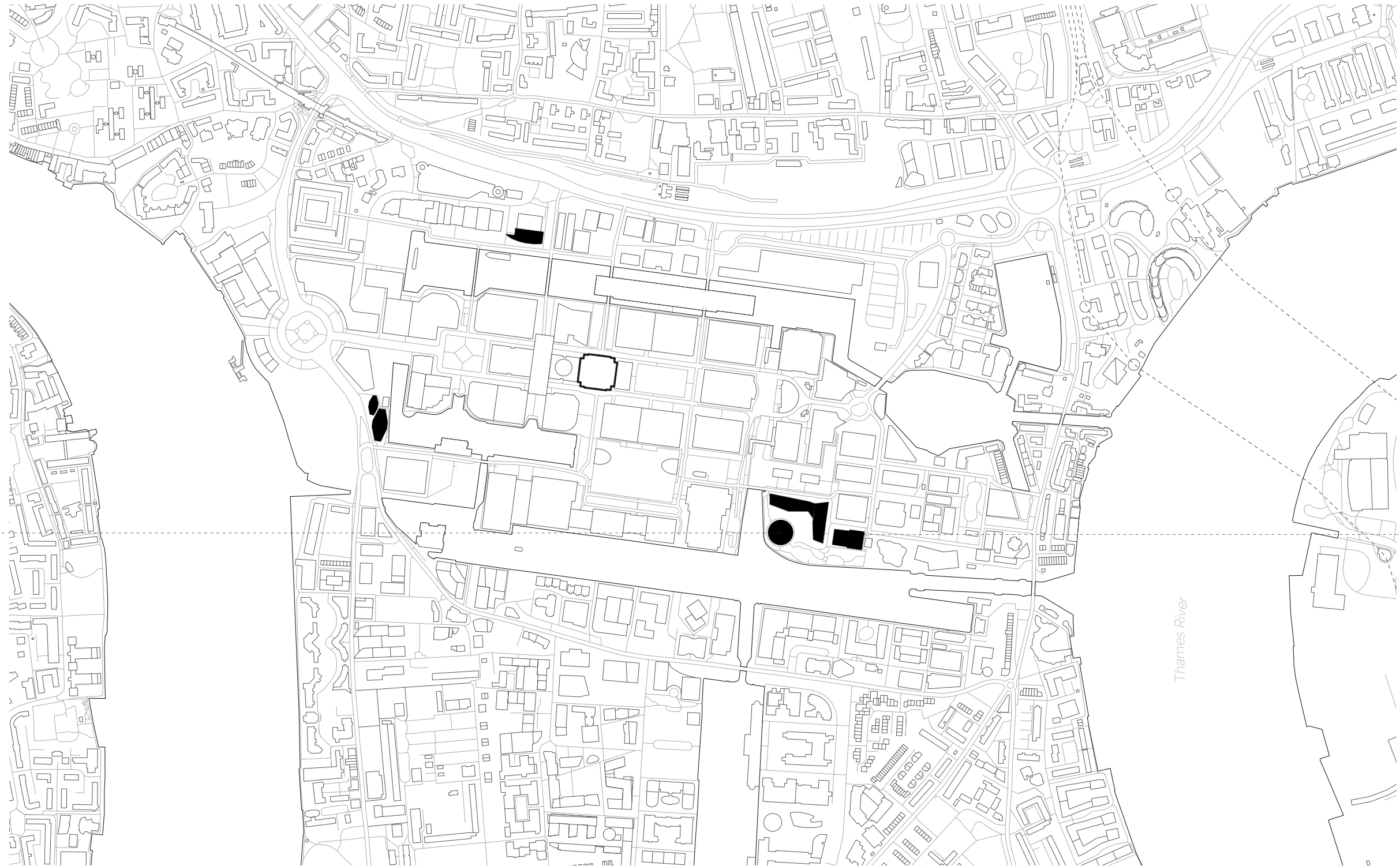


PROGRAM



Thames River

0' 100' 300' 600' 1000' 1500'



Residential

Residential

Thames River

0' 100' 300' 600' 1000' 1500'

Public: green

Public: leisure

Public: leisure

Public: green

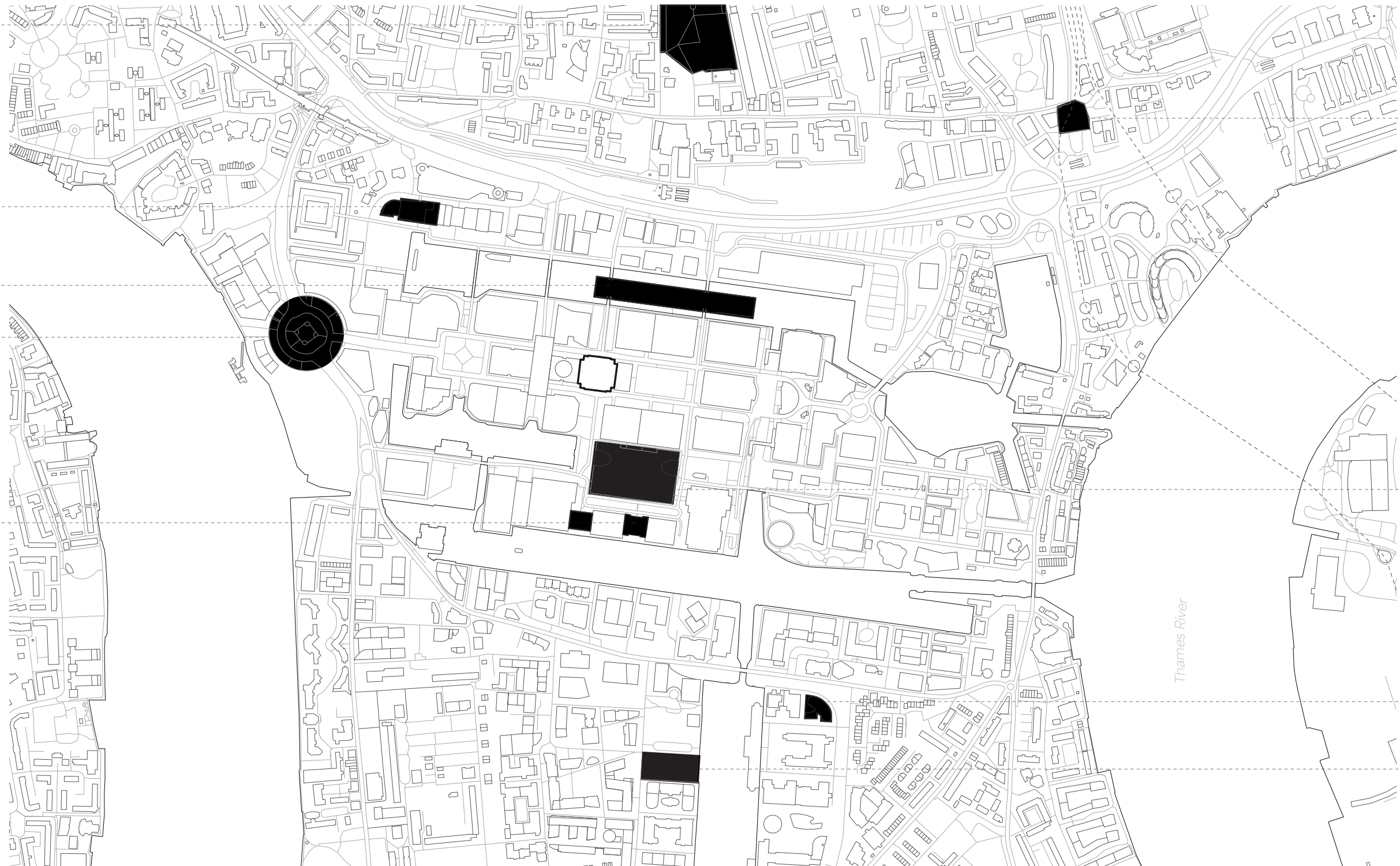
Public: leisure

Public: green

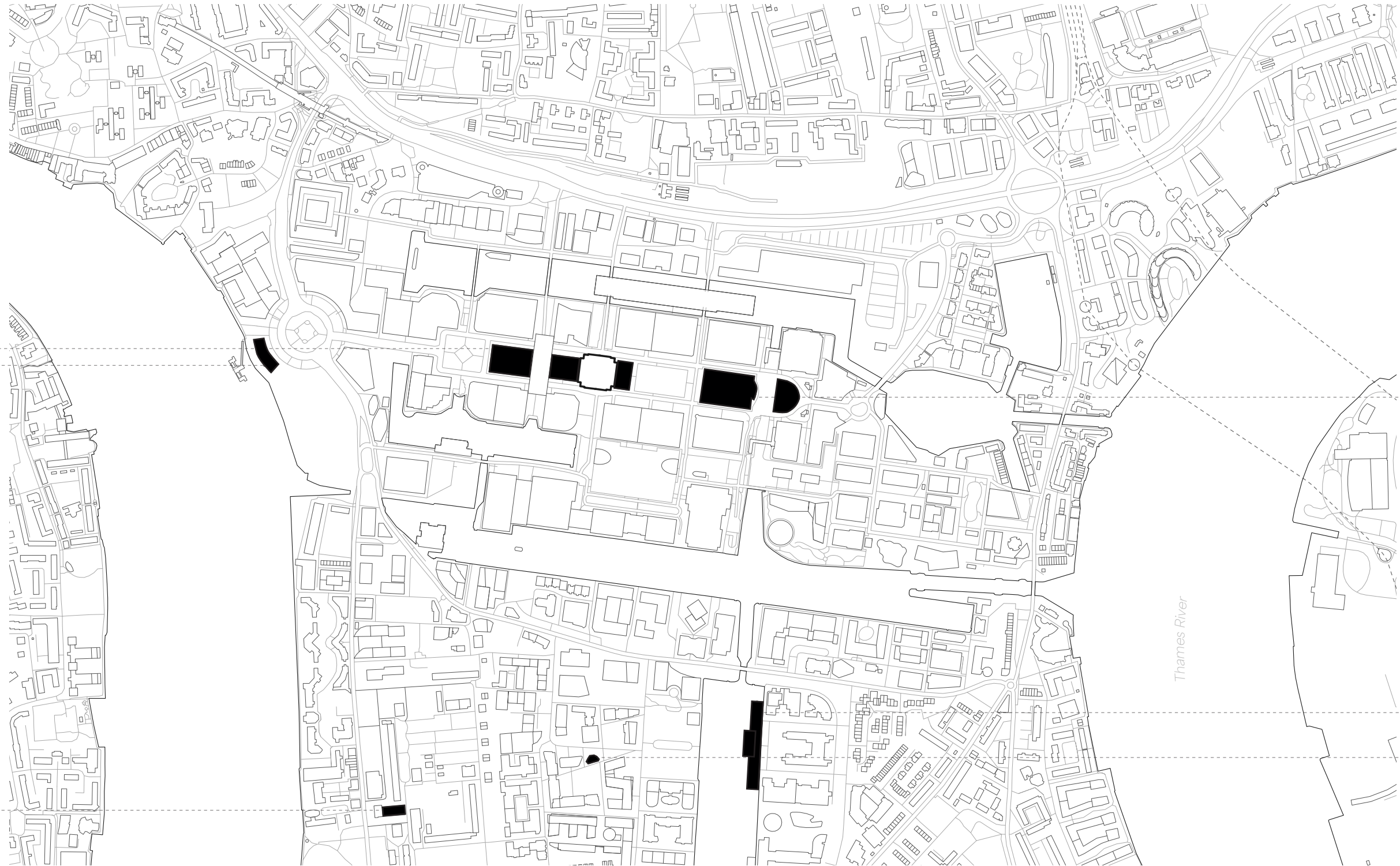
Public: green

Public: leisure

Public: green



0' 100' 300' 600' 1000' 1500'



Retail
Retail

Retail

Thames River

Retail

Retail

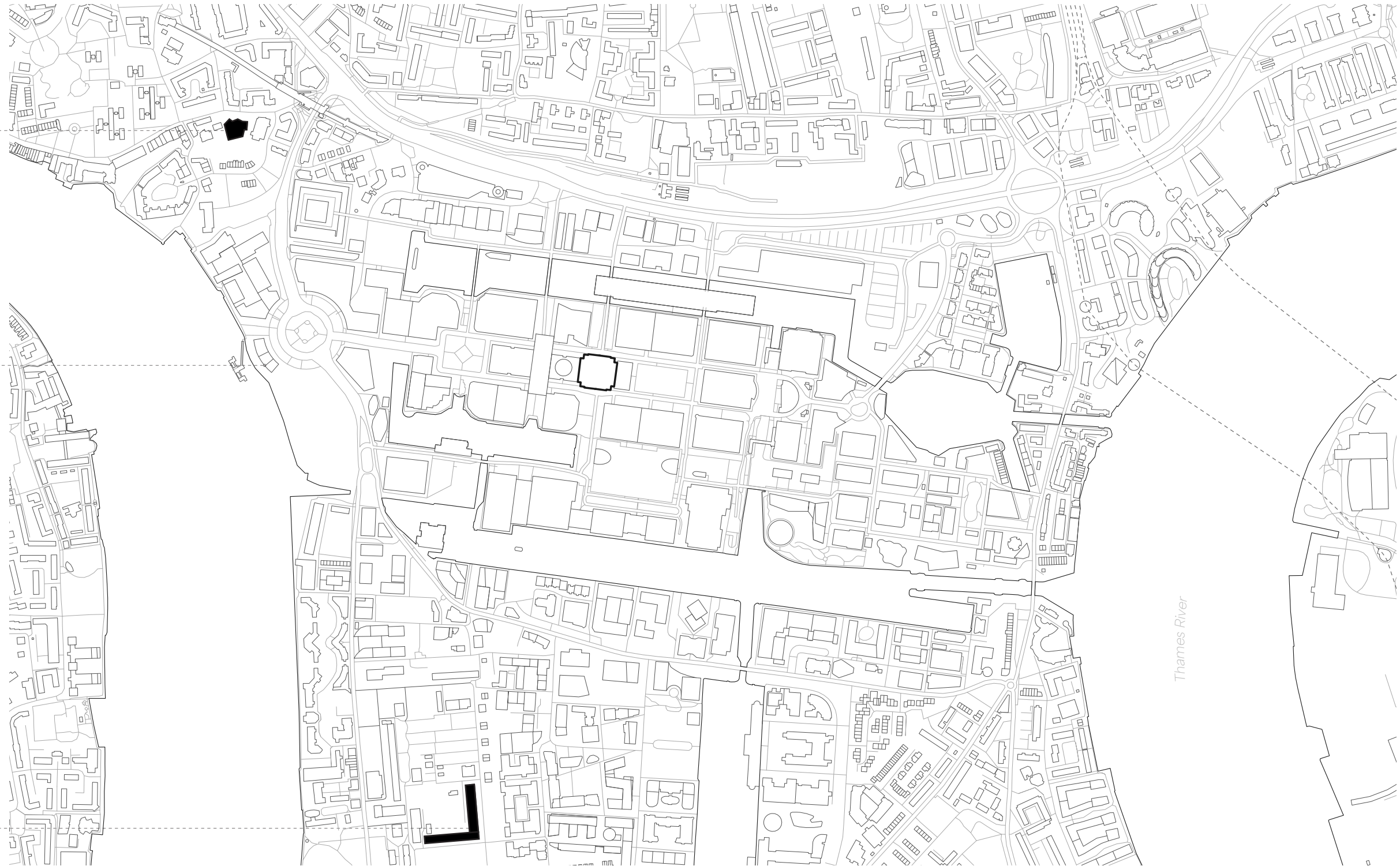
Retail

0' 100' 300' 600' 1000' 1500'

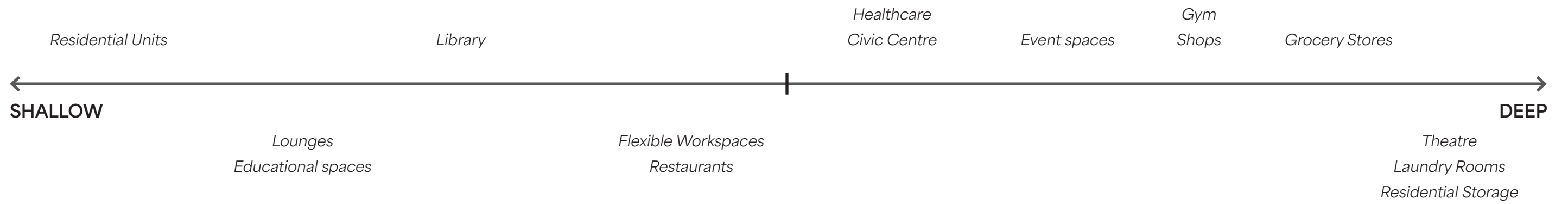
Primary school

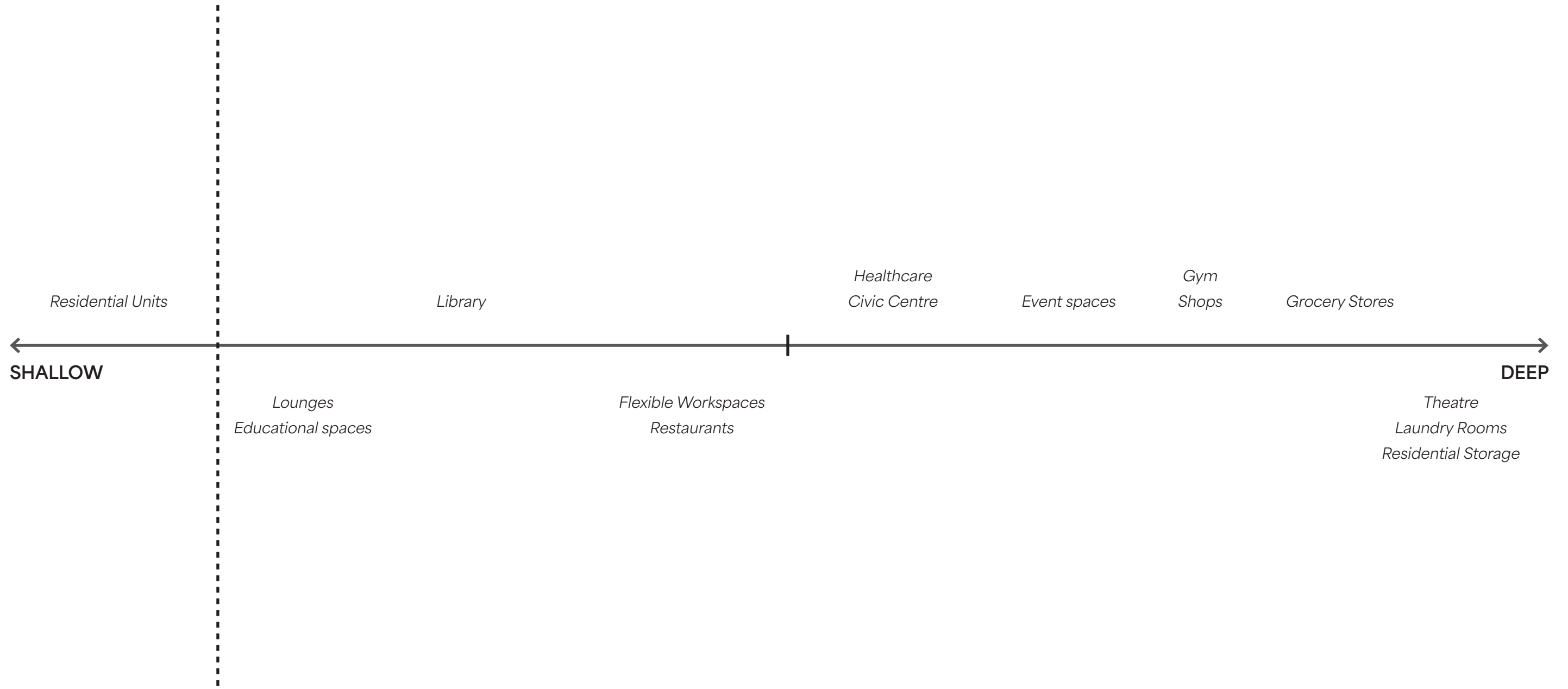
Retail

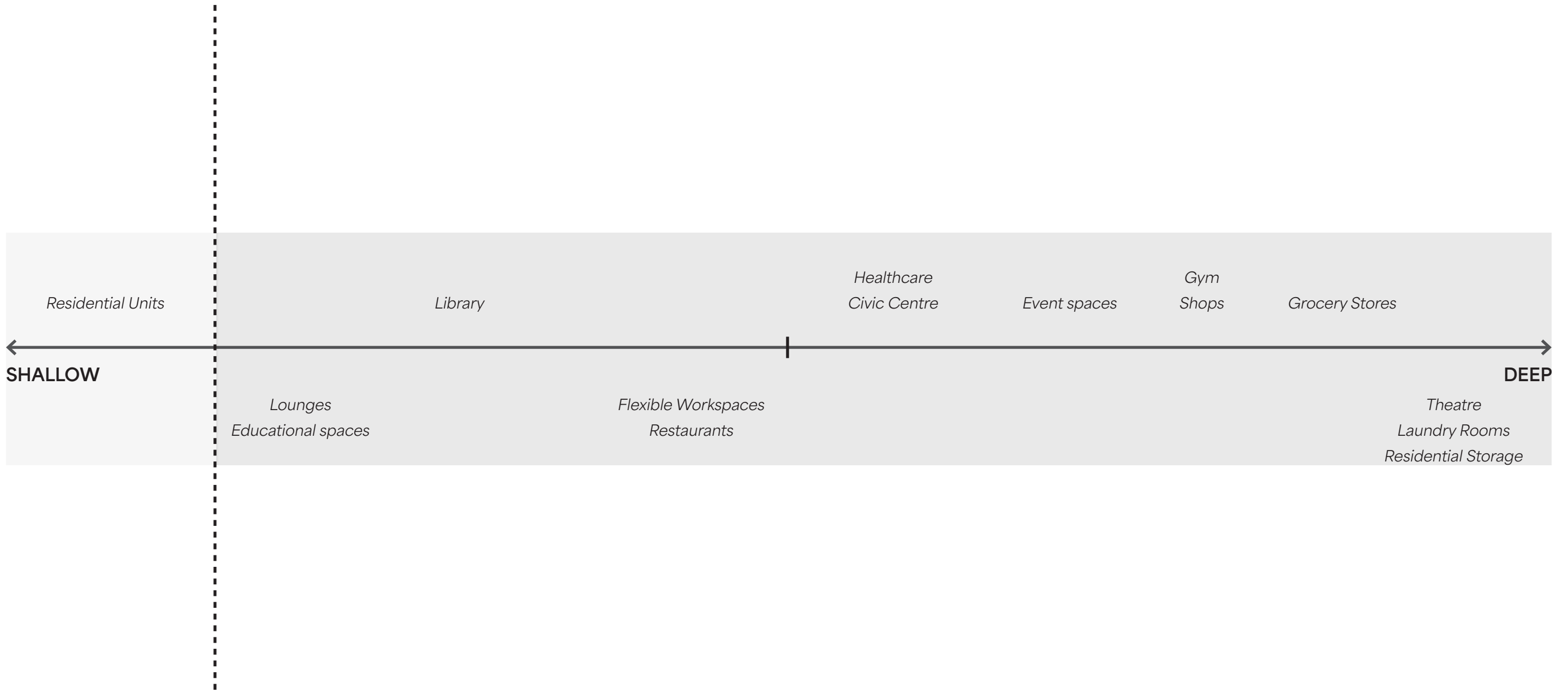
Primary school

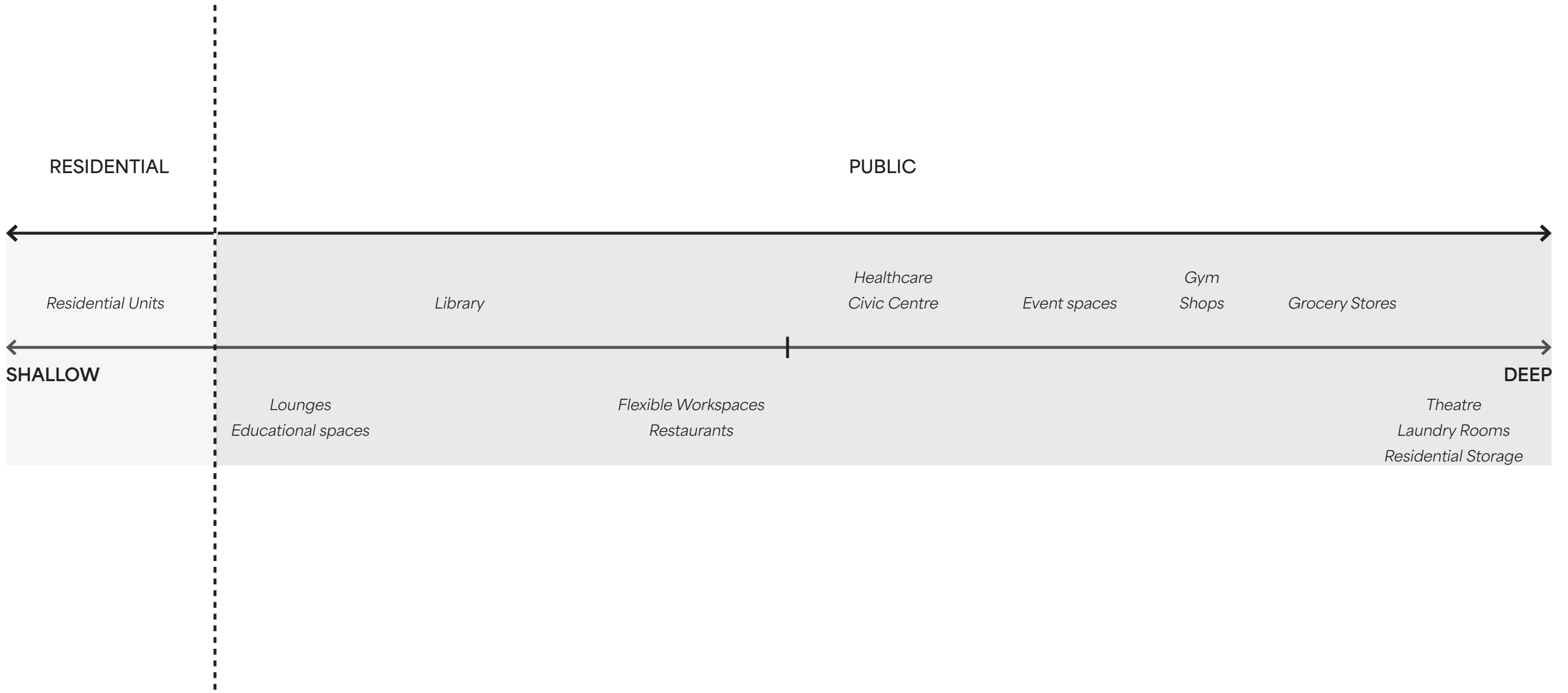


0' 100' 300' 600' 1000' 1500'

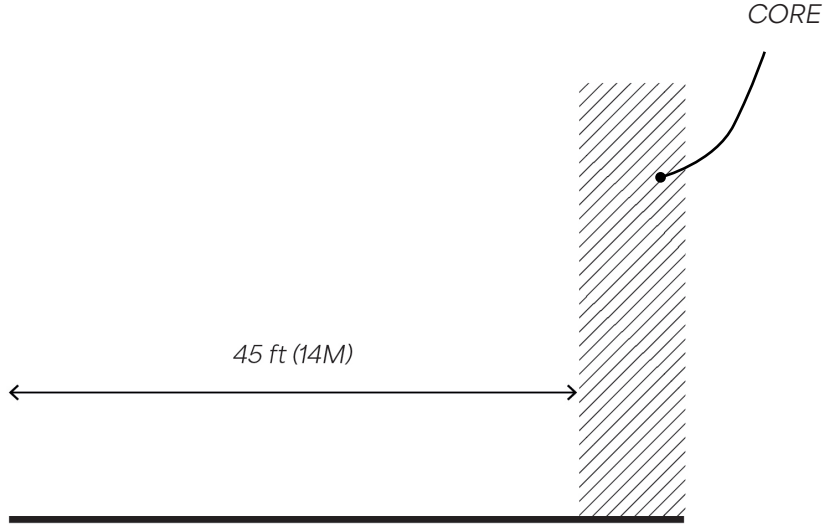




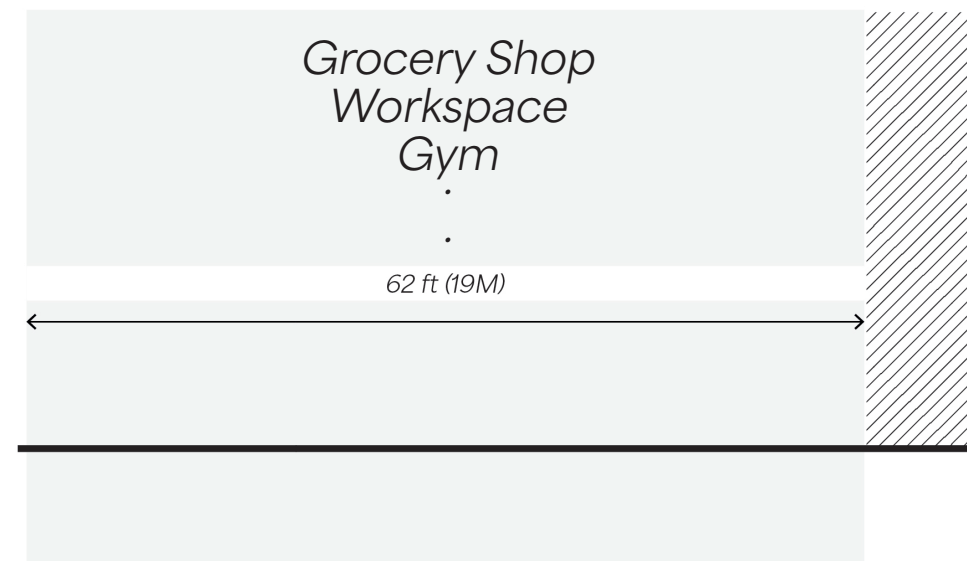
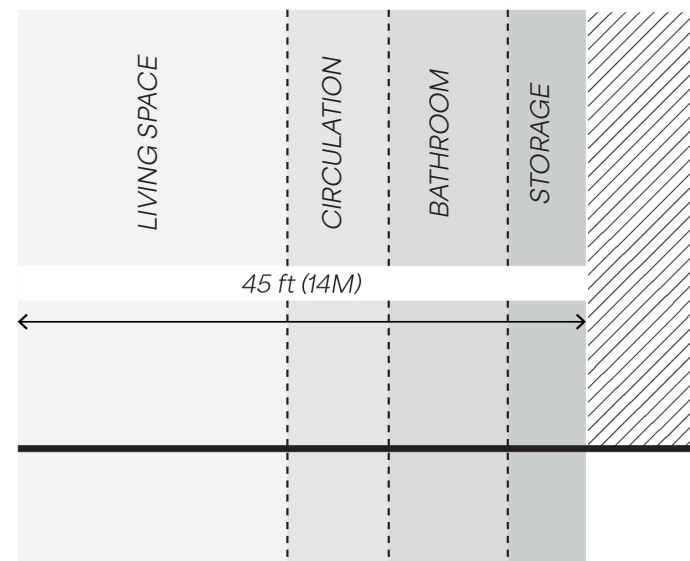




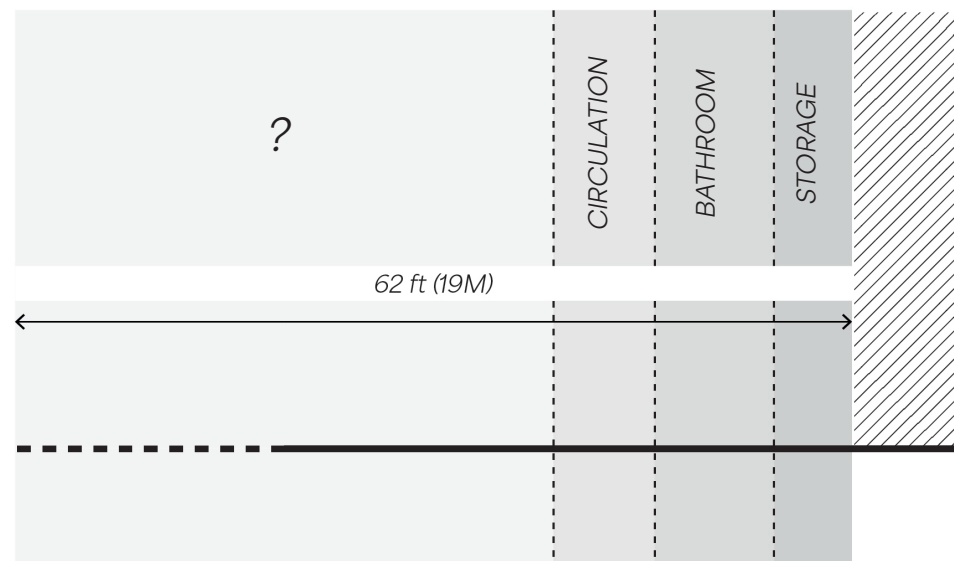
FLOOR DEPTH



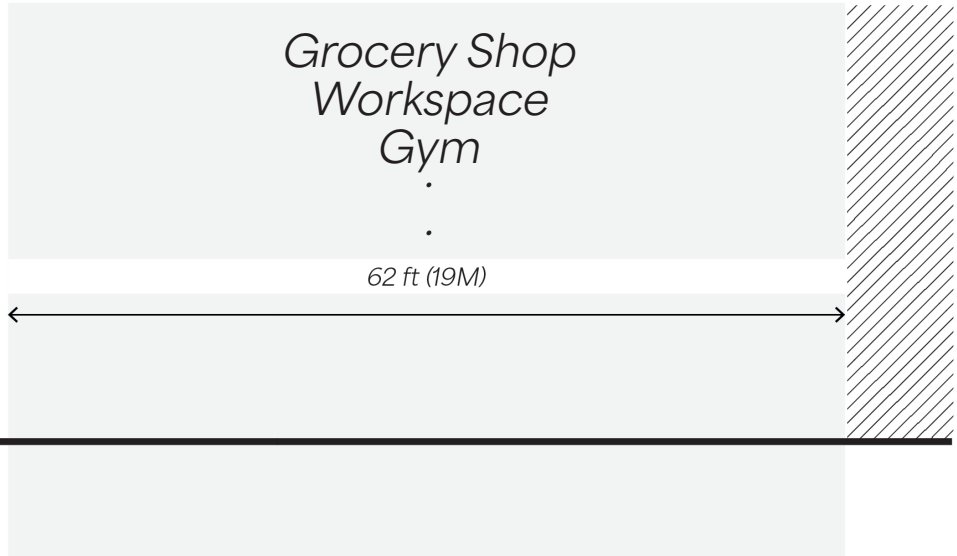
FLOOR DEPTH



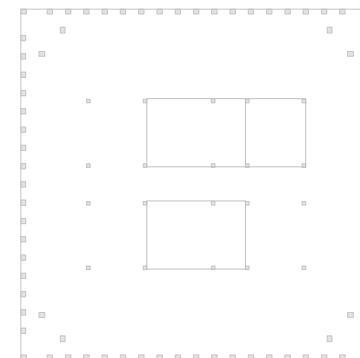
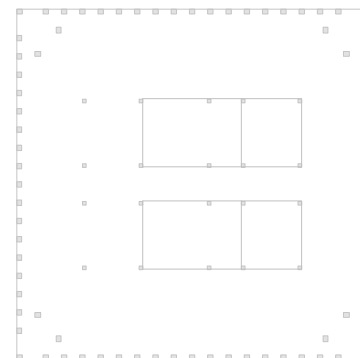
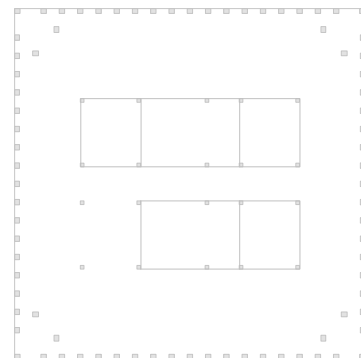
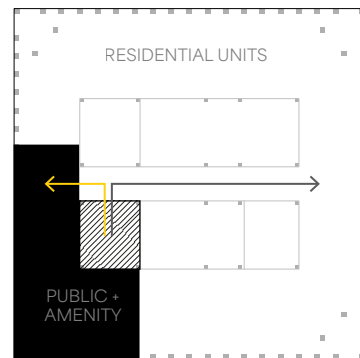
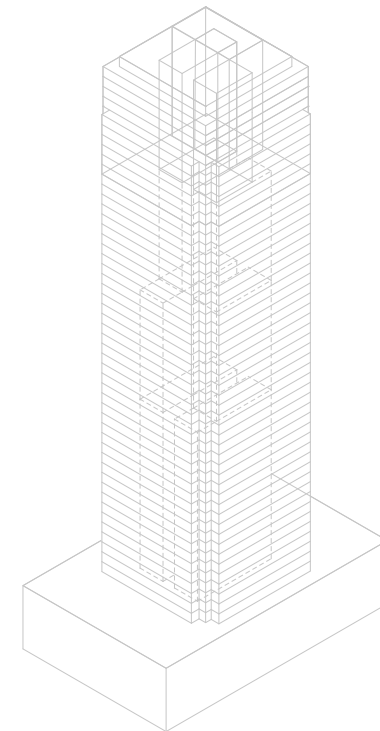
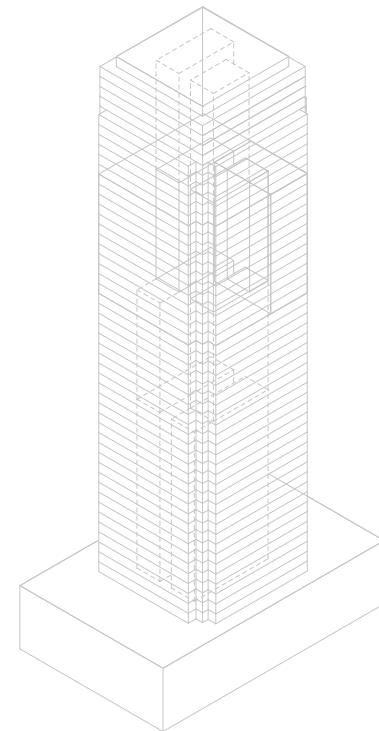
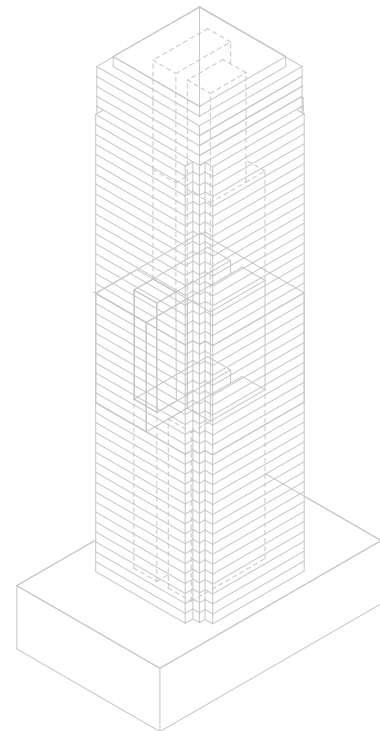
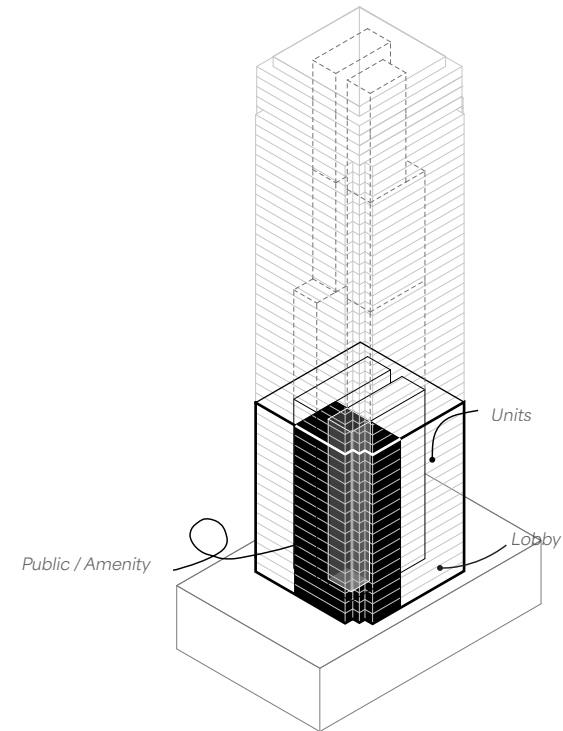
FLOOR DEPTH



FLOOR DEPTH



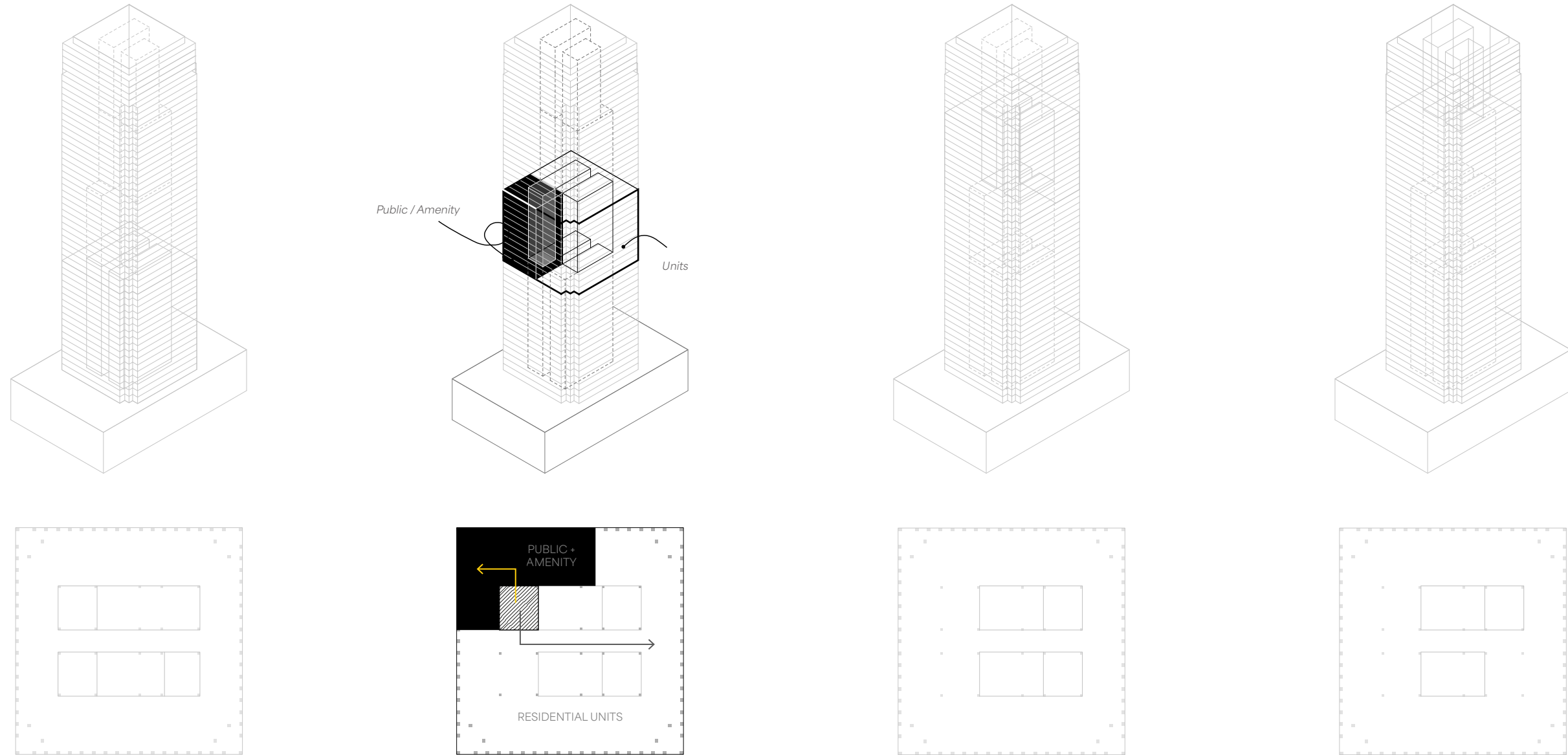
PUBLIC PROGRAM ACCESS



LOW

- ← Public Access
- ← Resident Access

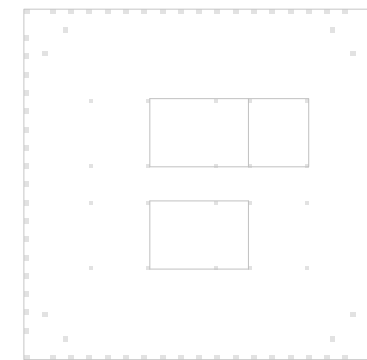
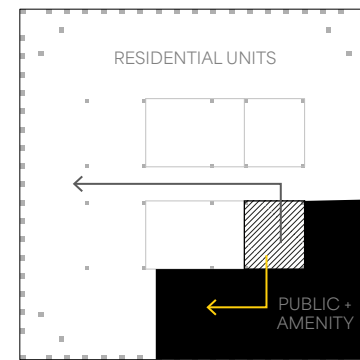
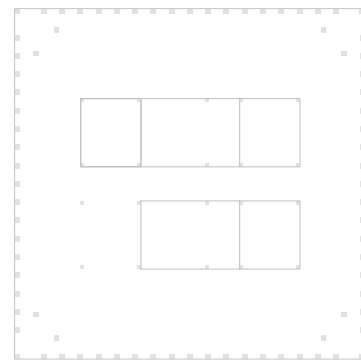
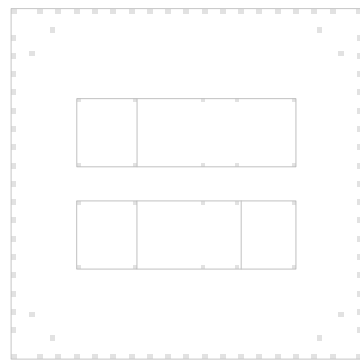
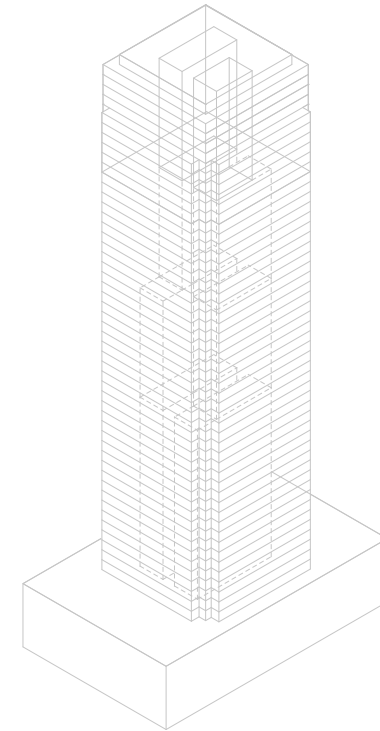
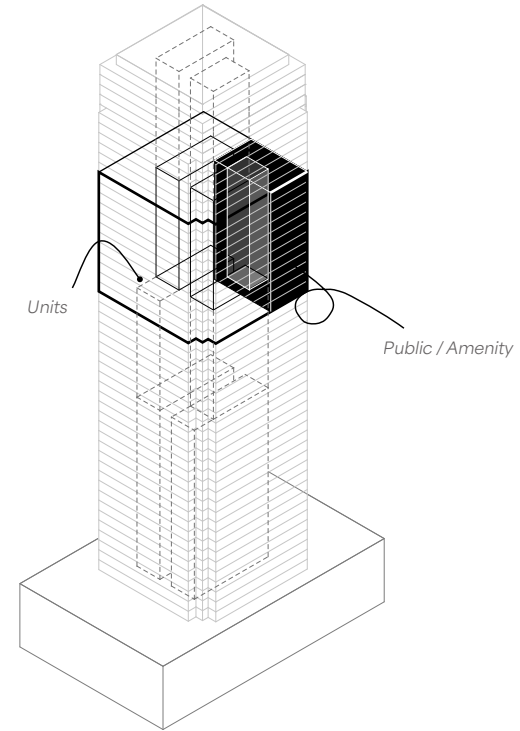
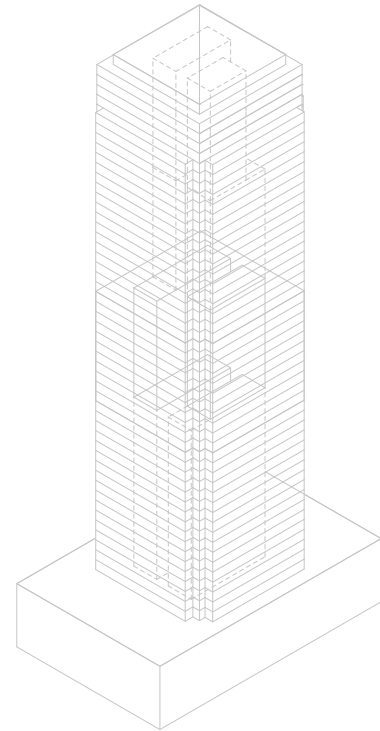
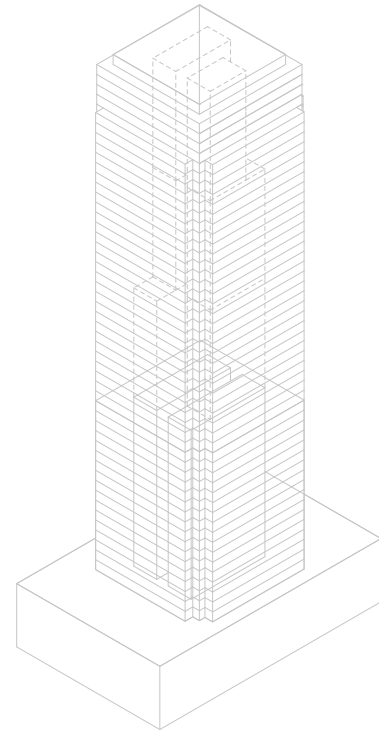
PUBLIC PROGRAM ACCESS



MID

← Public Access
← Resident Access

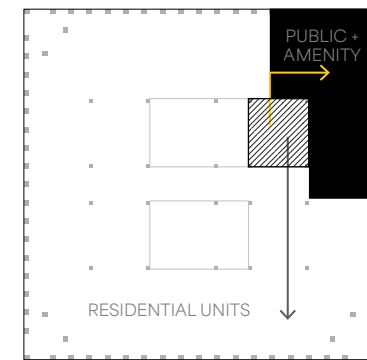
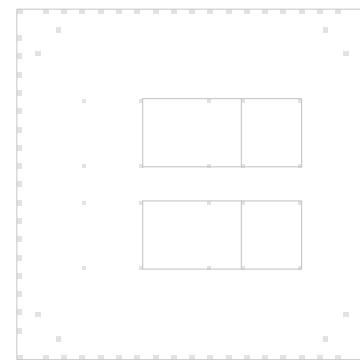
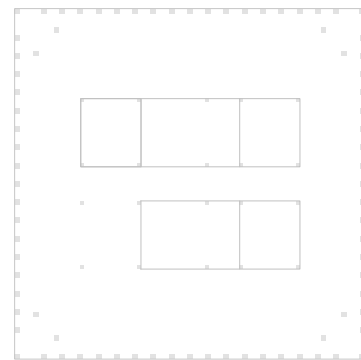
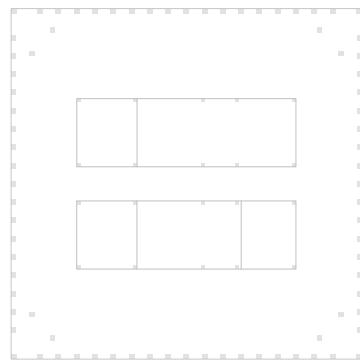
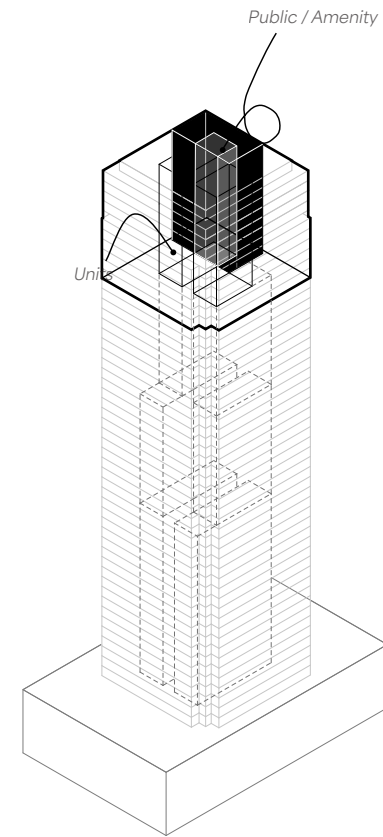
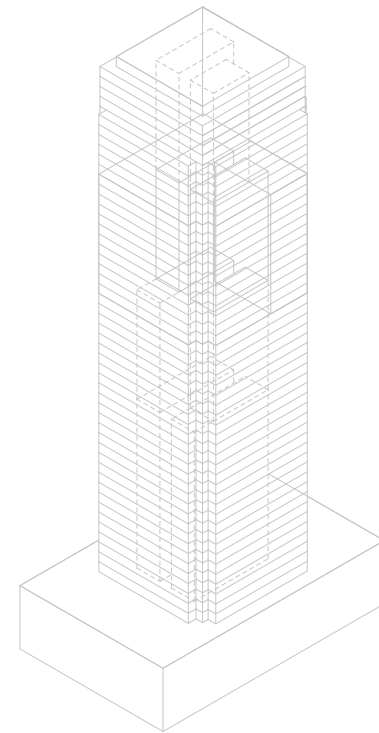
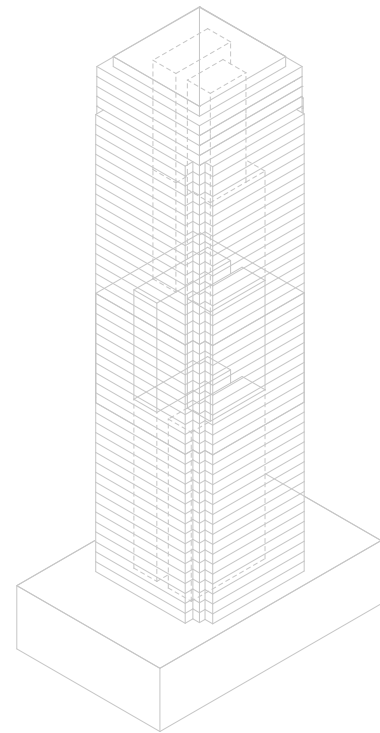
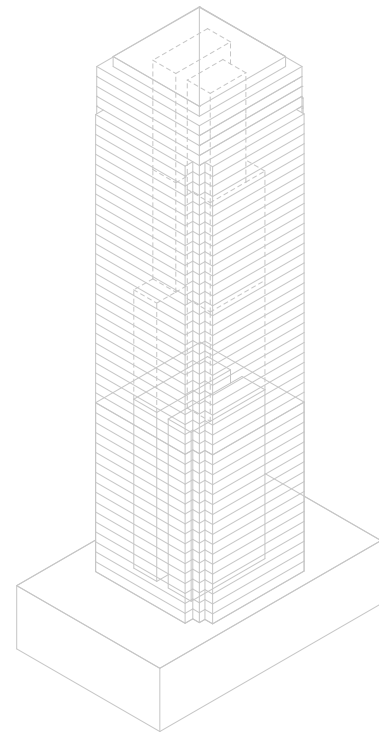
PUBLIC PROGRAM ACCESS



MID-HIGH

- ← Public Access
- ← Resident Access

PUBLIC PROGRAM ACCESS



HIGH

- ← Public Access
- ← Resident Access

[How to Tailor 50-story Office]
Program study

To accommodate a considerable number of residents in the heart of the financial district, the project employs supporting programs that could reactivate and redefine the site, challenging 9-5 urbanism.

West Elevation South Elevation East Elevation North Elevation

1 Day-care

Two-storey day-care program includes classrooms, admin offices, restroom and playrooms.

2 Hair Salon

Small hair salon can only take few customers at a time.

3 Open Space (L)

Large open space usually are 3-storey high, looking outward.

4 Lounge

Small and Medium sized lounges are in the lobby and scattered across the entire building.

5 Library

Large Library occupies entire floor. It has computer rooms, stacks, reading rooms.

6 Observatory Deck

It is located at a highest level among other non-residential programs.

7 Office (M)

Medium Office is flexible working space located in the lower part of the building.

8 Grocery Shop (S)

Small grocery shop is located evenly within the entire building.

9 Open Space (M)

Medium open space also can become lounge spaces for residences.

10 Office (S)

Small workspace could be enclosed zoom rooms and meeting rooms.

16 Office (L)

Large office space is flexible workspace for both non-residences, and residences.

15 Grocery Shop (M)

Medium grocery shops are more for residences; they are located in the middle body of the tower.

14 Cafe

Cafe spaces are adjacent to theater, offices, library and grocery shops.

13 Theater

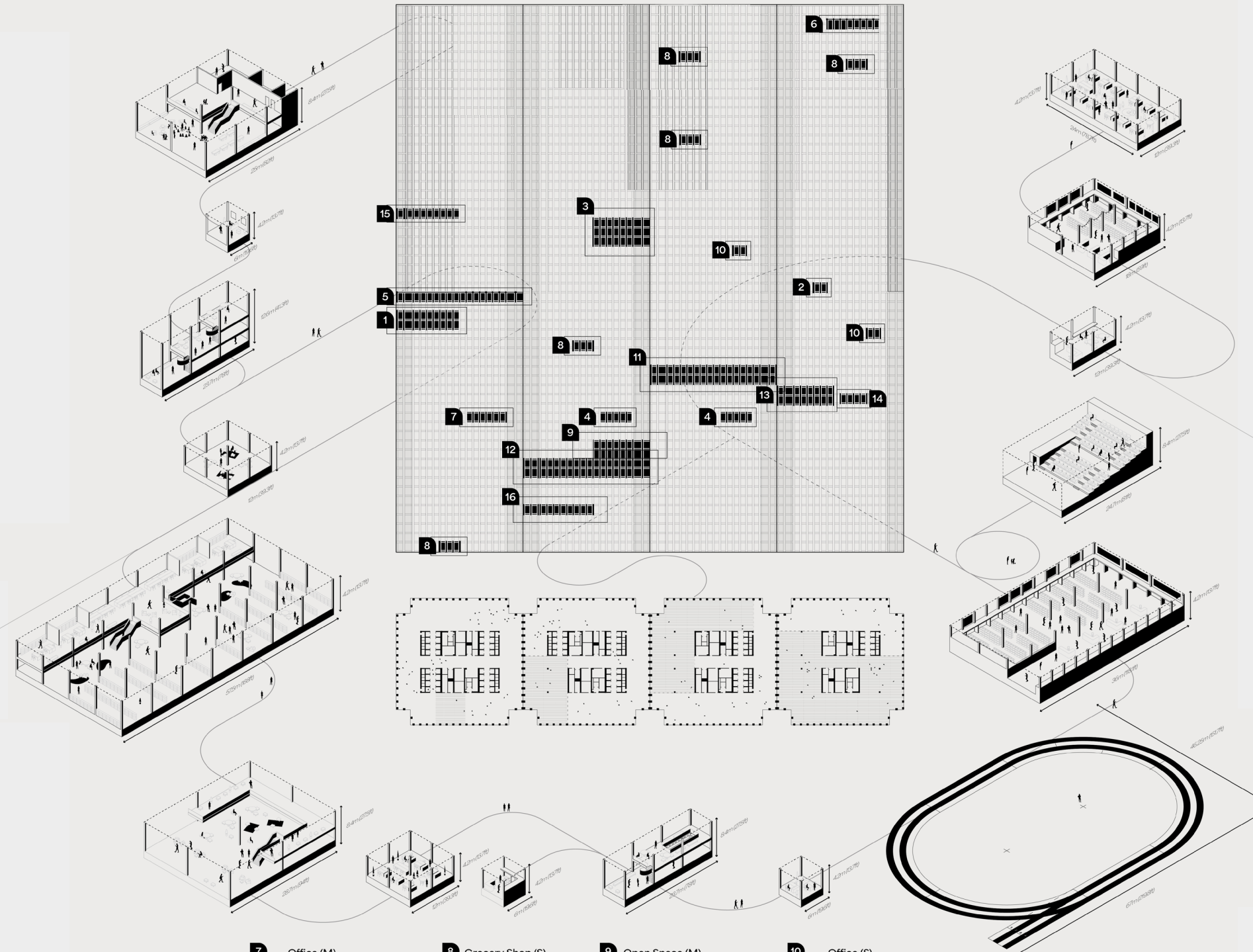
Theater is places where deep floor plate is secured.

12 Grocery Shop (L)

Large grocery shop is located at a lower body of the building.

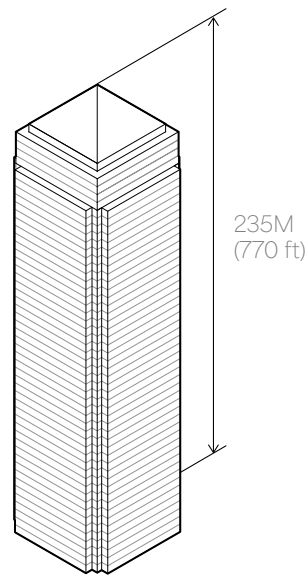
11 Gym

Gym occupies two entire floors. It will have running tracks, swimming pool as well as basic equipments.

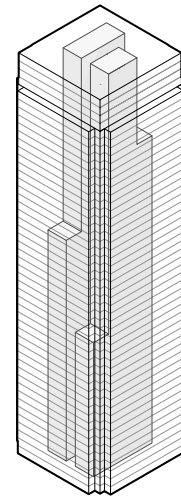


INTERVENTION

MASSING DEVELOPMENT

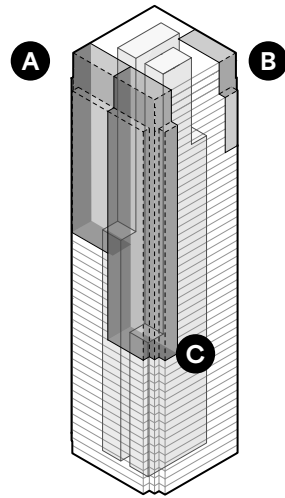


EXISTING
CONDITION



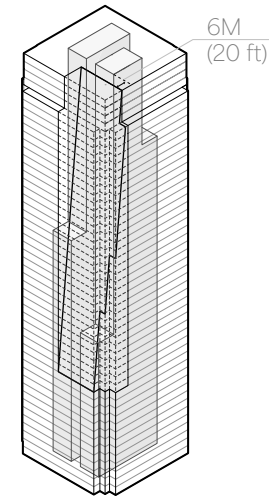
CORE

Existing building has 4 elevator zones for efficient traffic flow.



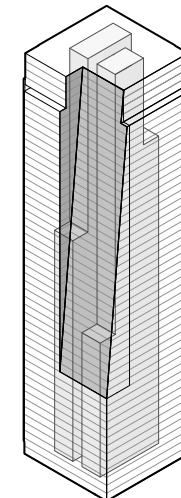
DEEP FLOOR

There are 3 possible parts identified for intervention.



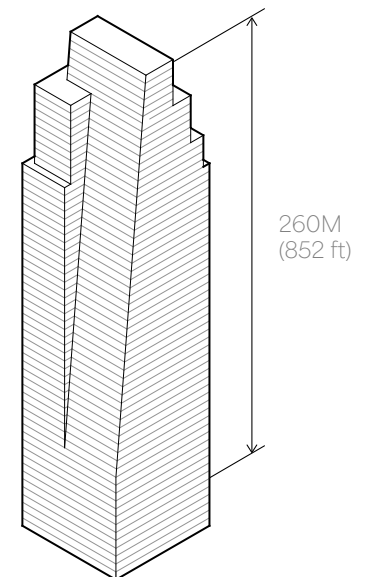
SLOPE

While maintaining 6m depth on top, the structure continues on angle for load path.

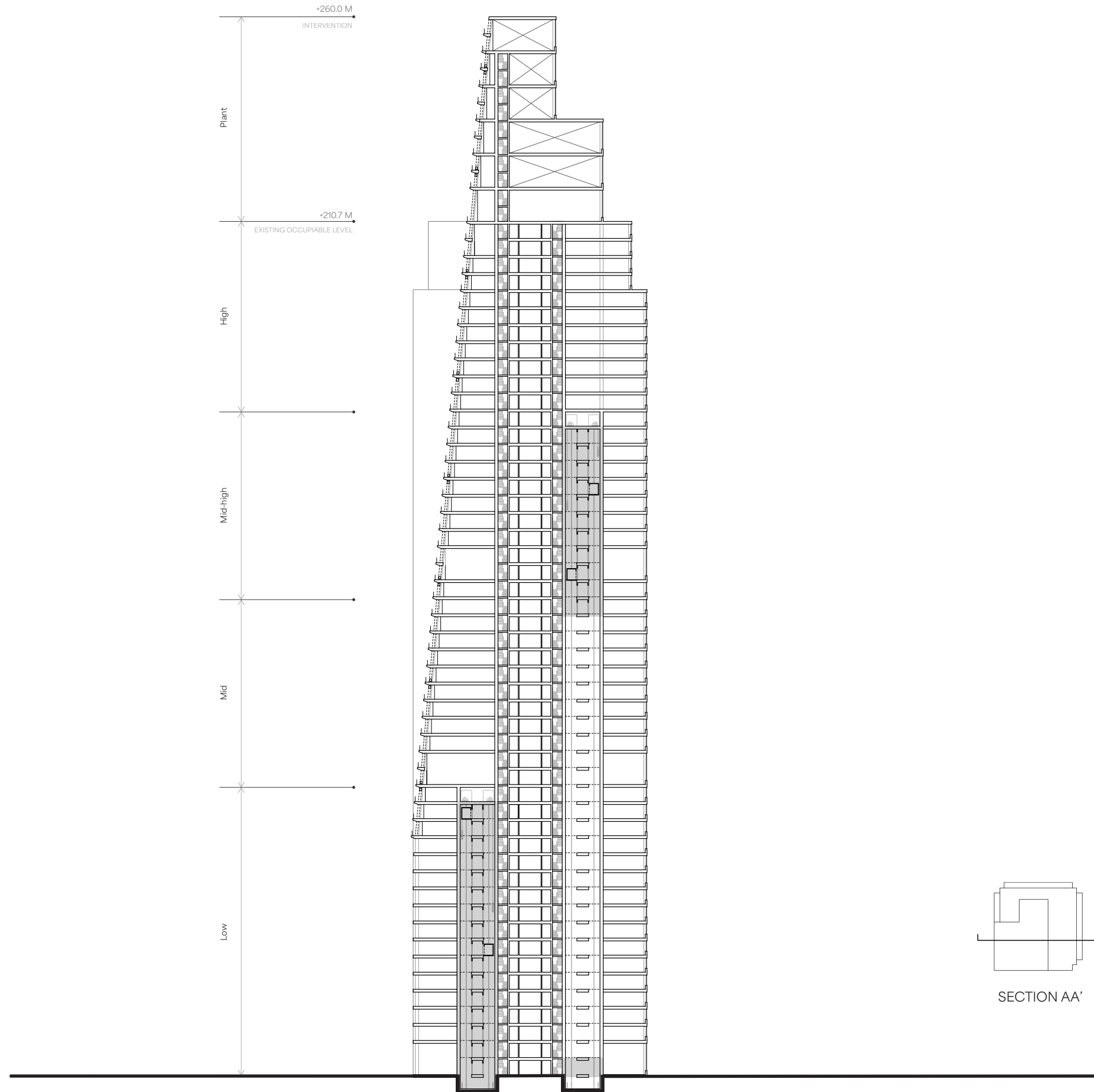


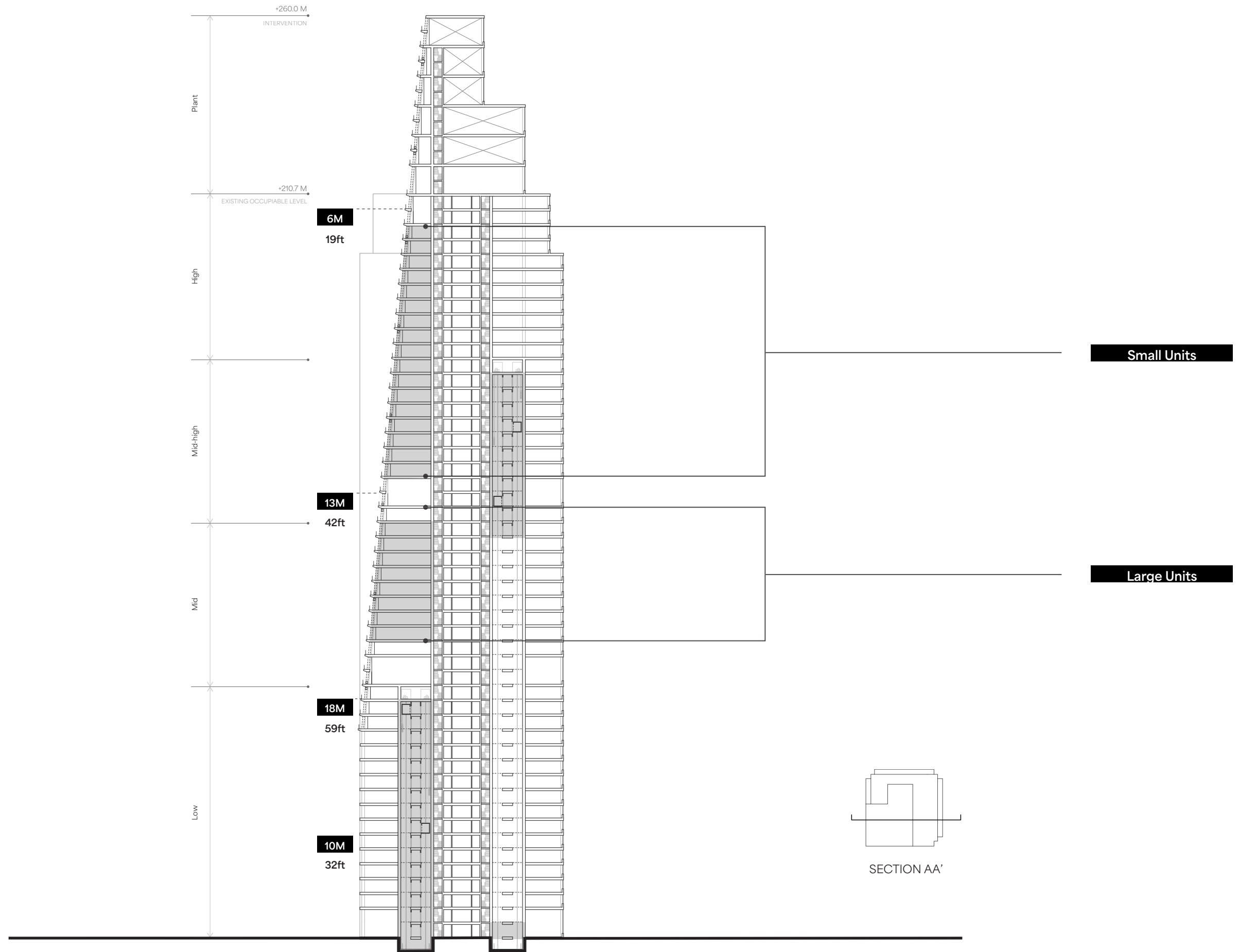
ACCESS TO
DAYLIGHT

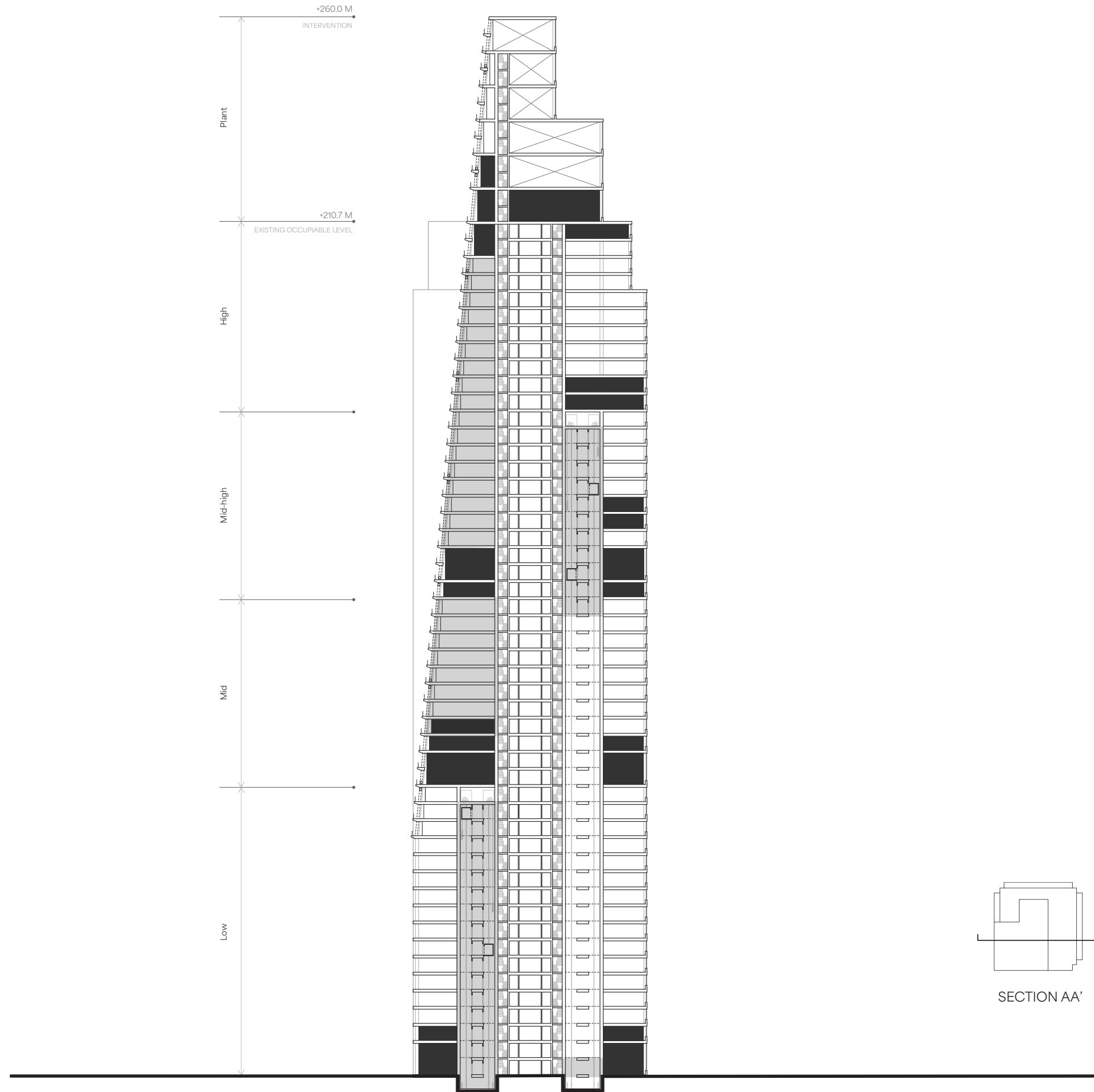
Intervention benefits from the new south-facing facade.



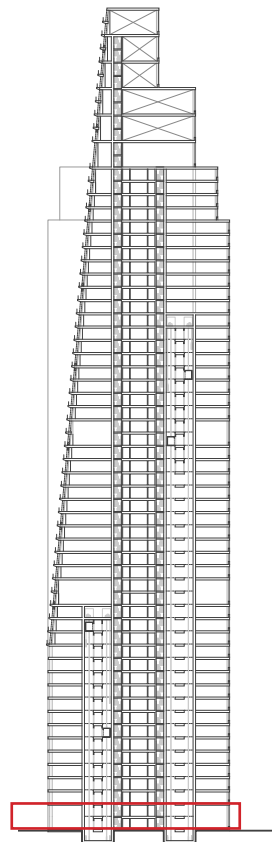
INTERVENTION



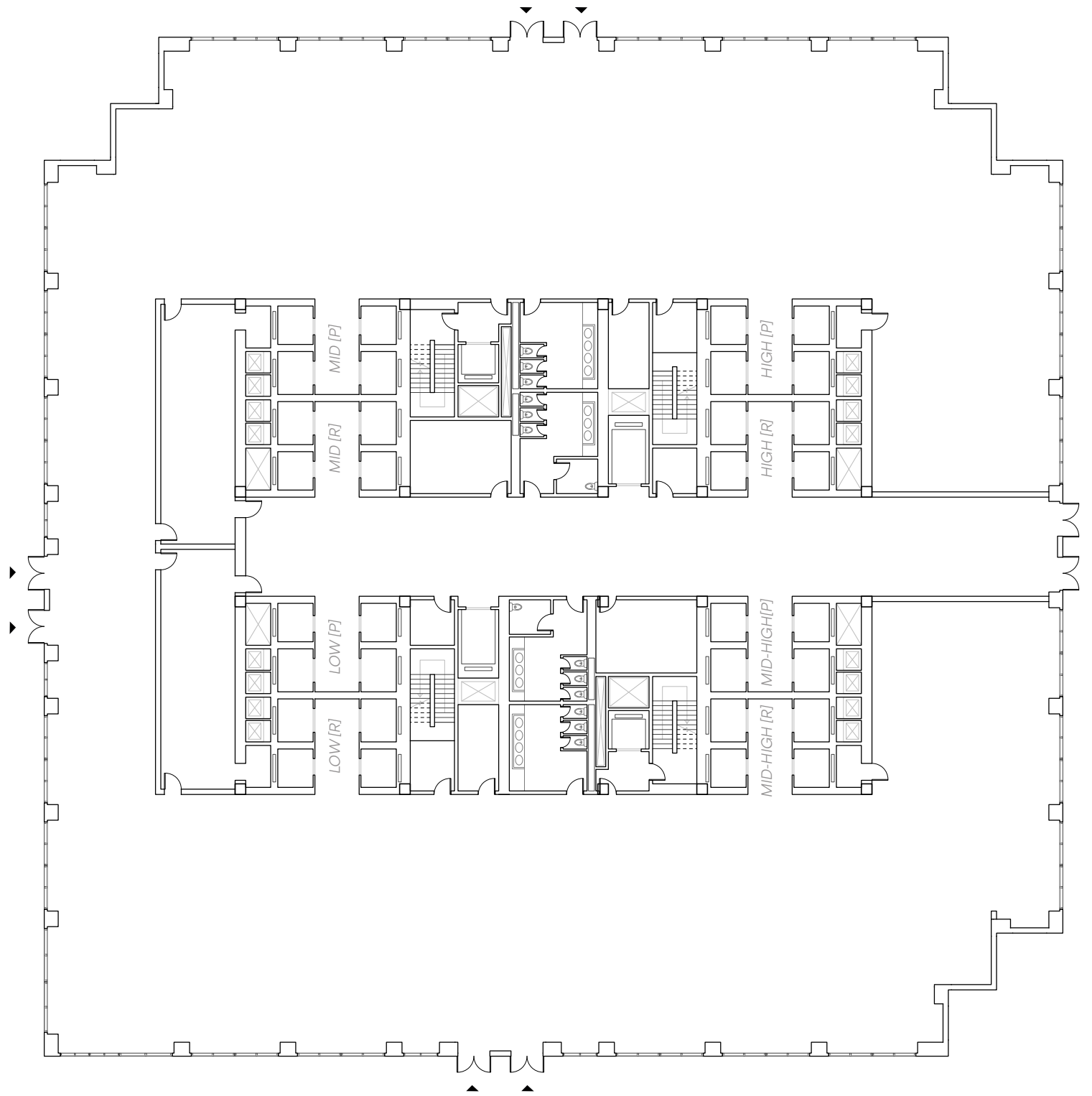








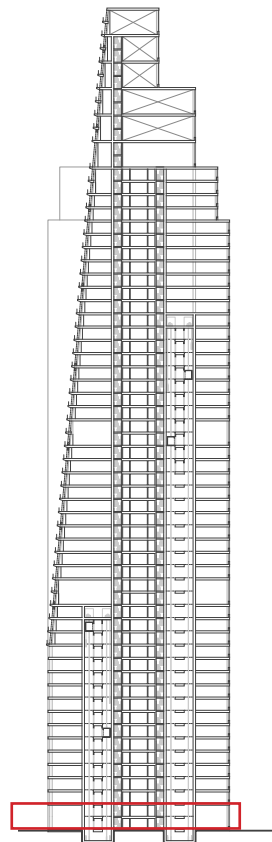
2023.12.20



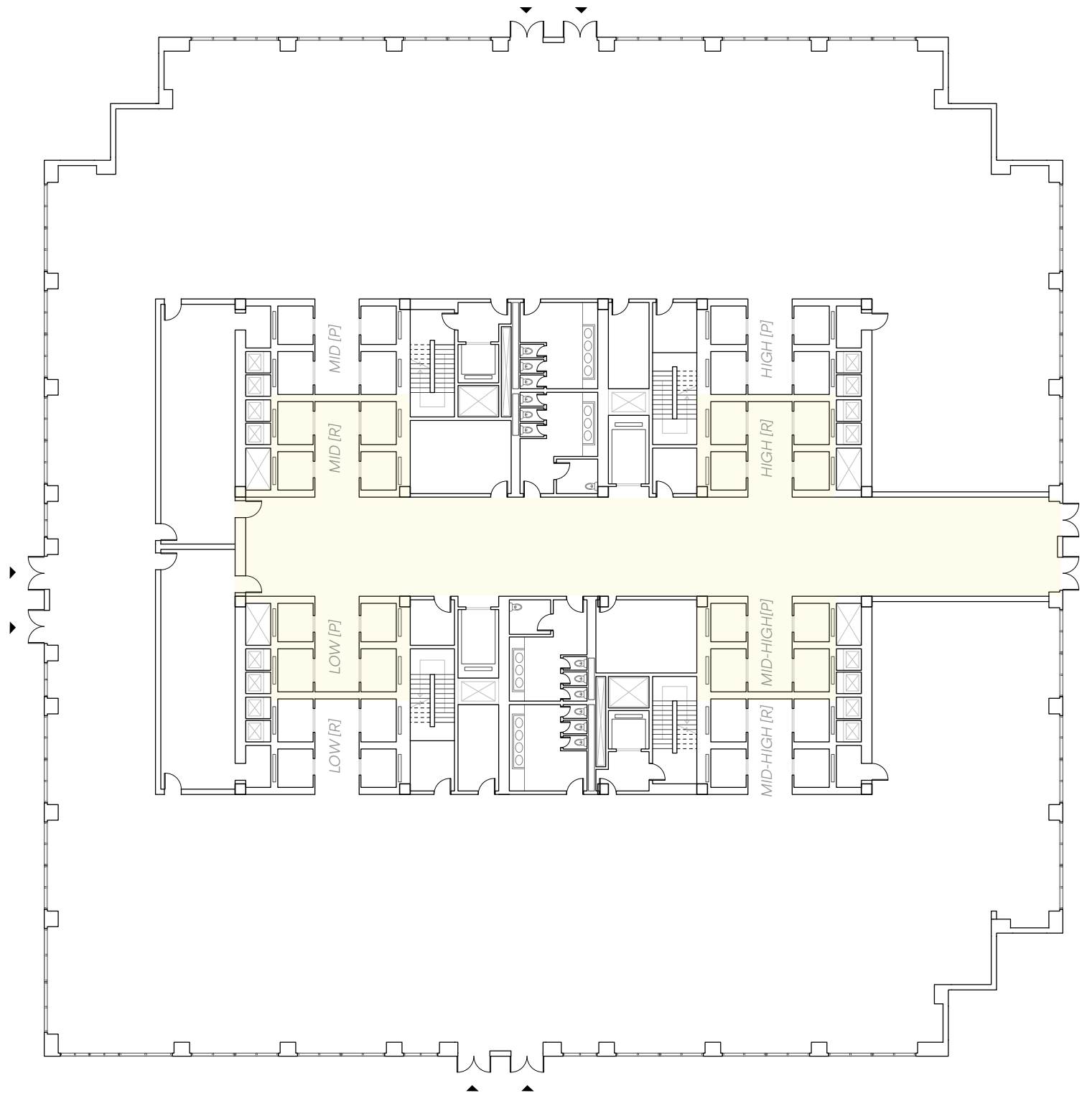
Ground Floor



Jiyeon Lee



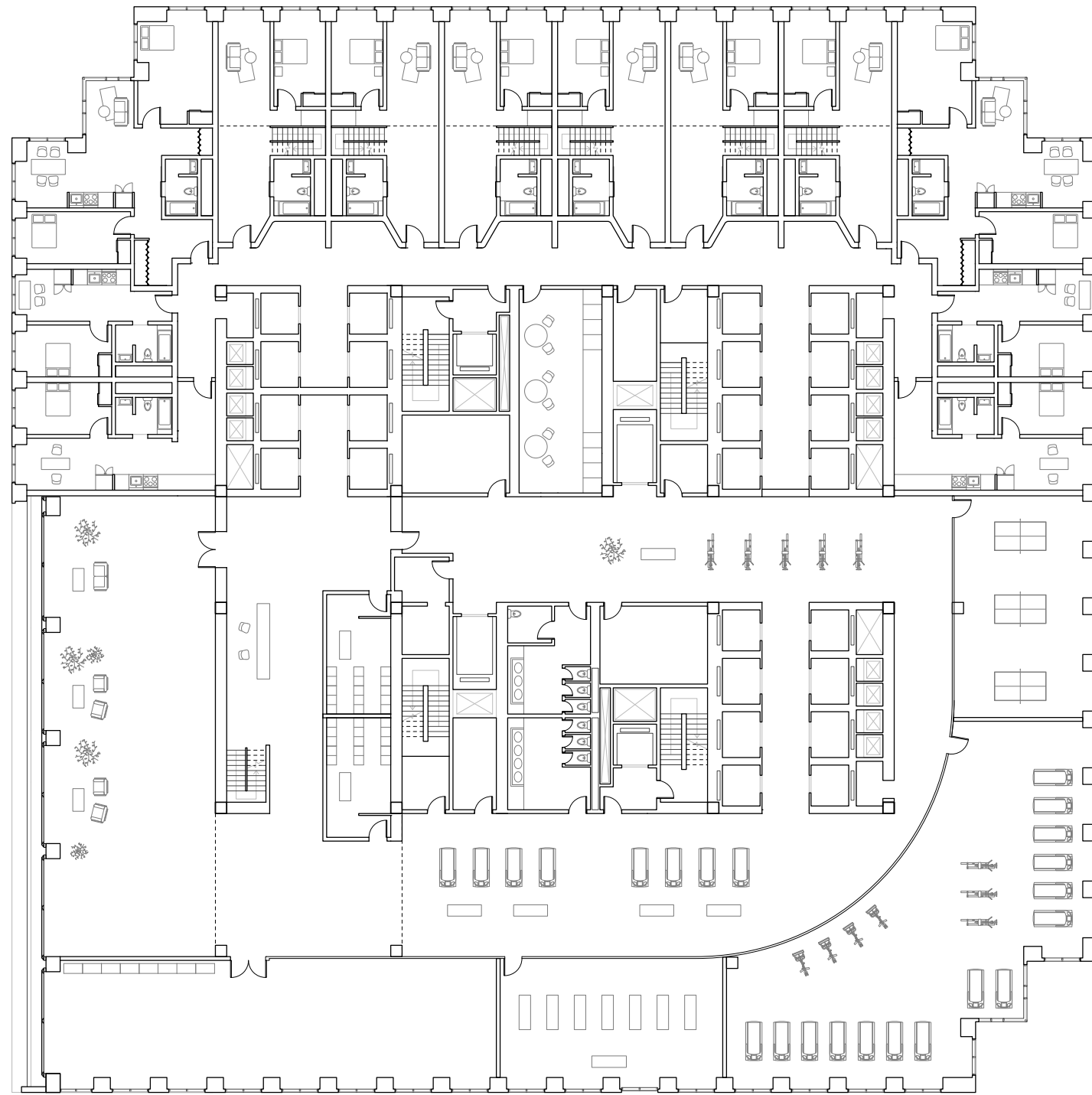
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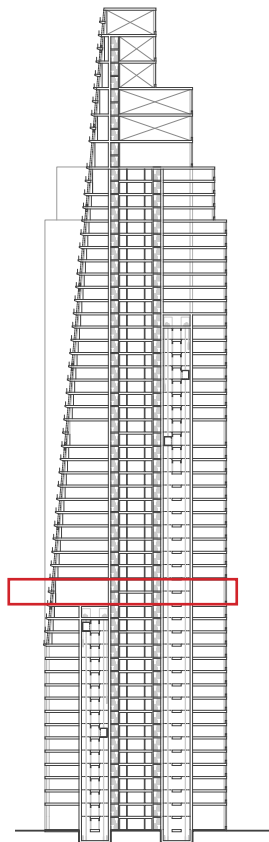
Ground Floor
Public Access



Jiyoon Lee

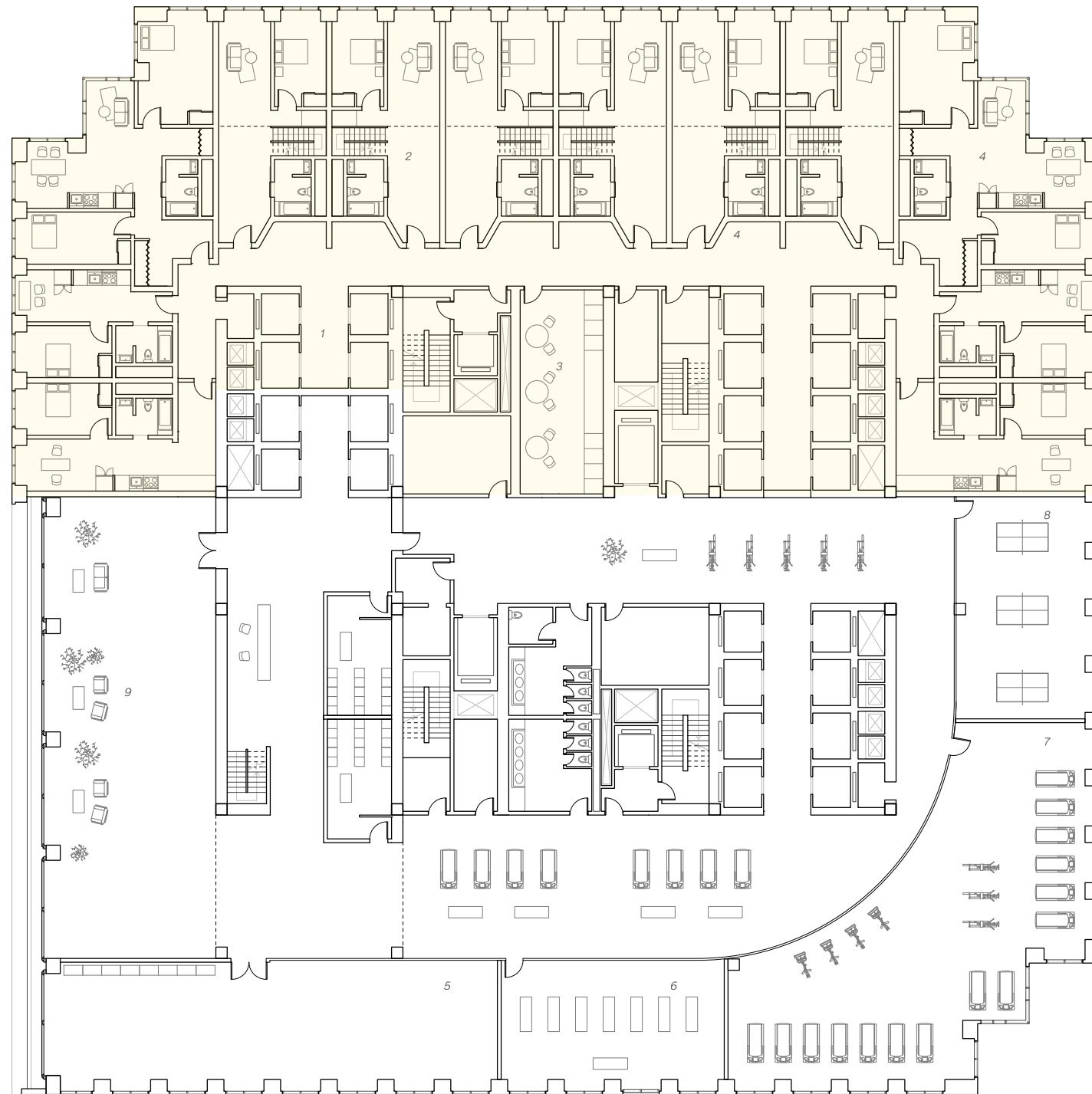
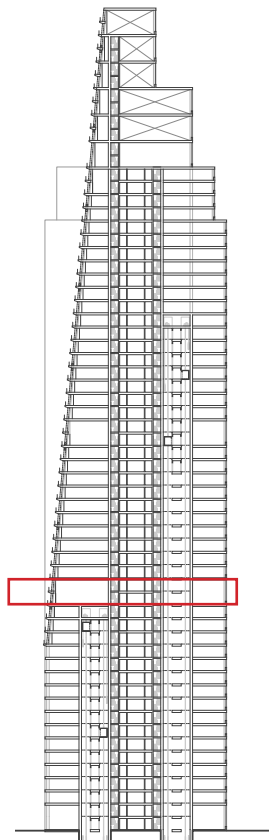


Level 17
12 Units + Gym



Legend

- 1. Elevator bank for residents
- 2. Residential units
- 3. Laundry room
- 4. Large units

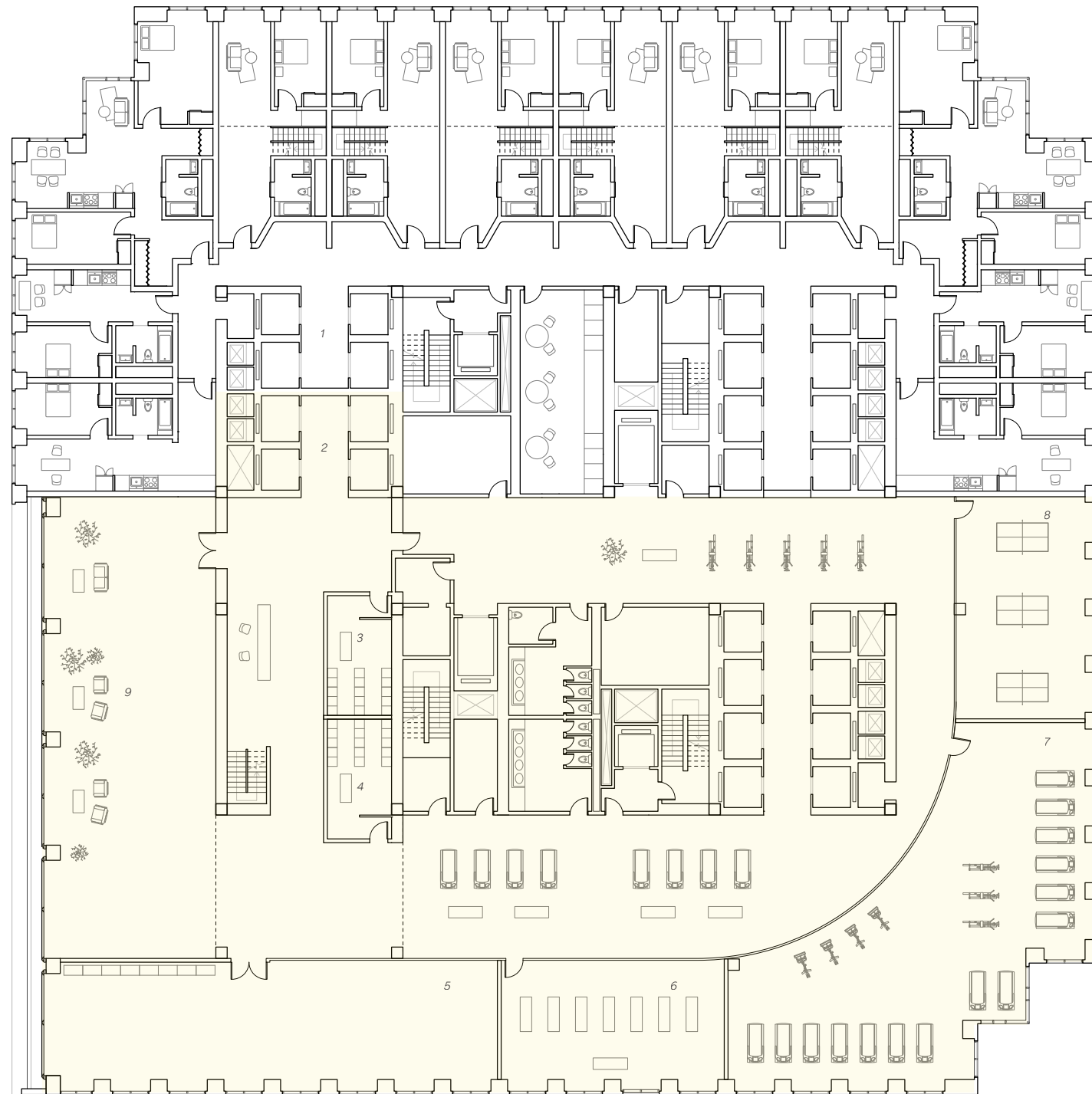
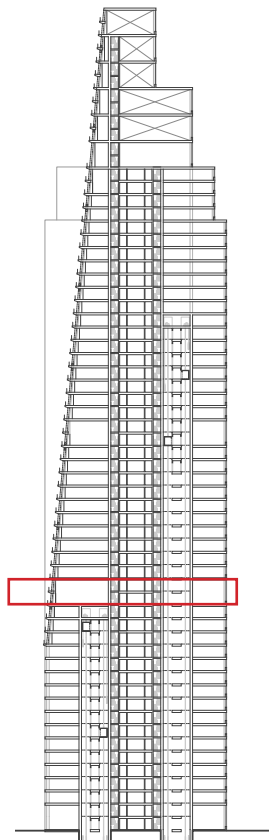


Level 17
12 Units + Gym



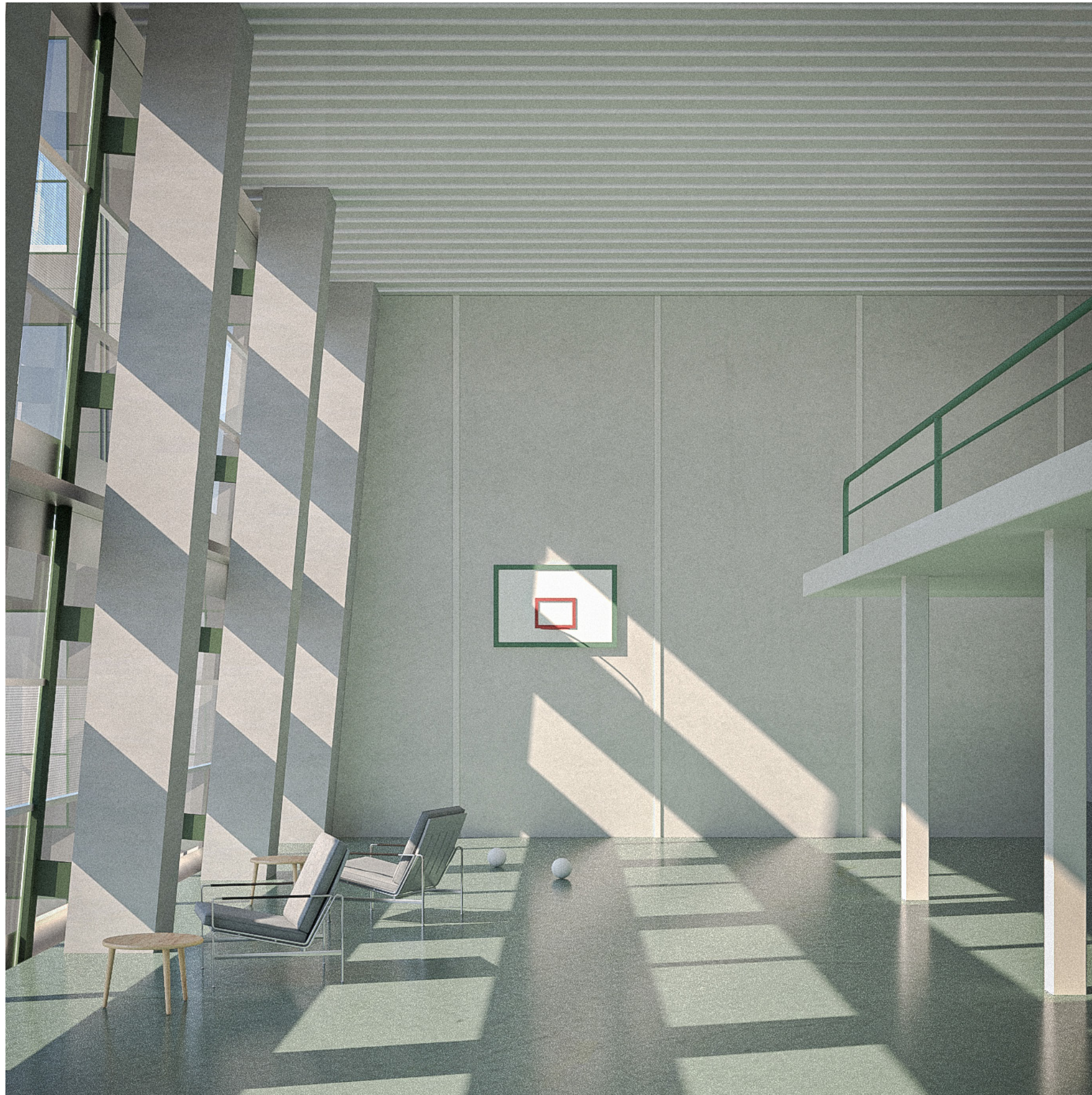
Legend

- 1. Elevator bank for residents
- 2. Elevator bank for gym
- 3. Changing room
- 4. Changing room
- 5. Exercise room
- 6. Yoga room
- 7. Exercise room
- 8. Table Tennis room
- 9. Lounge for gym users



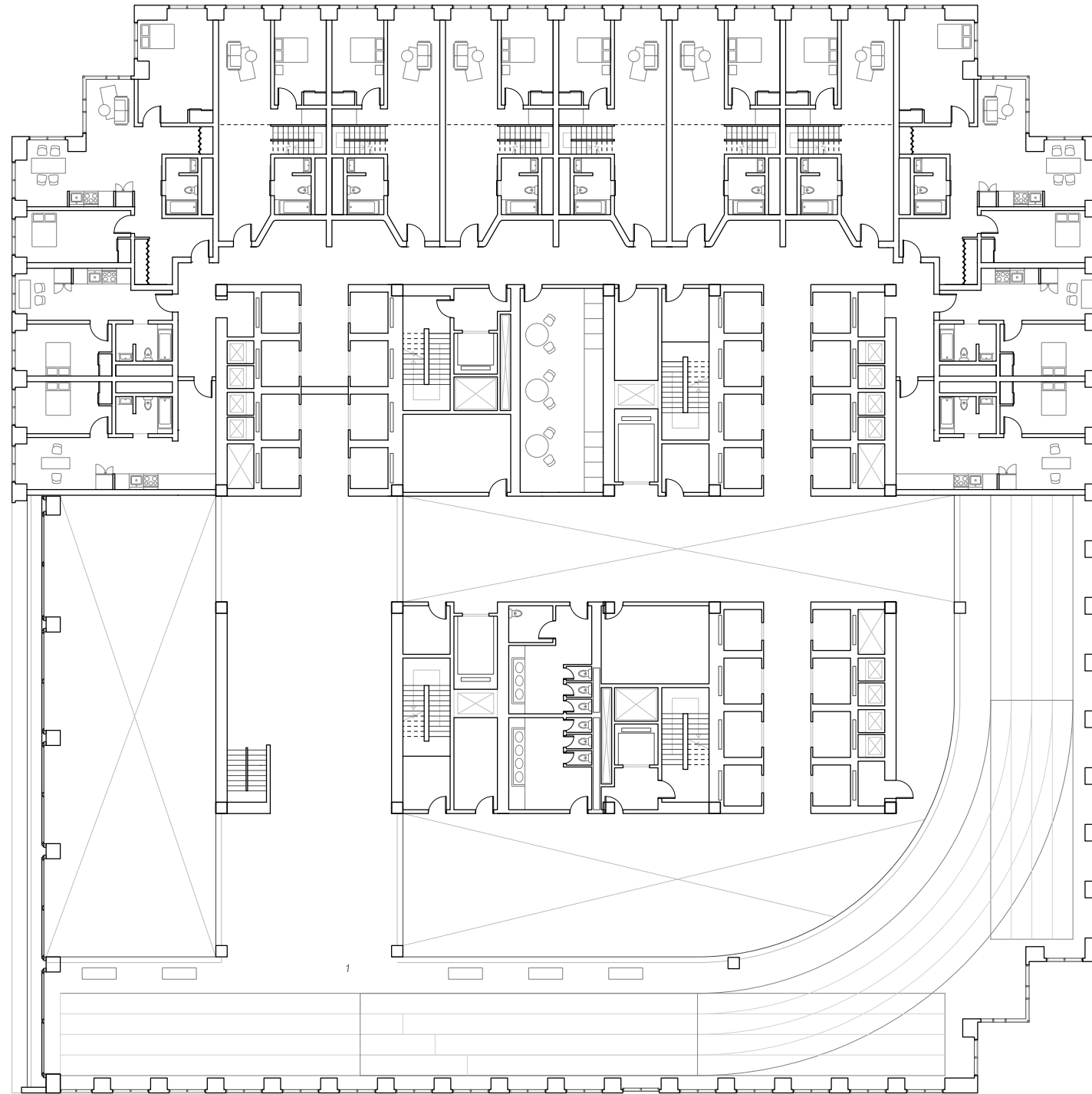
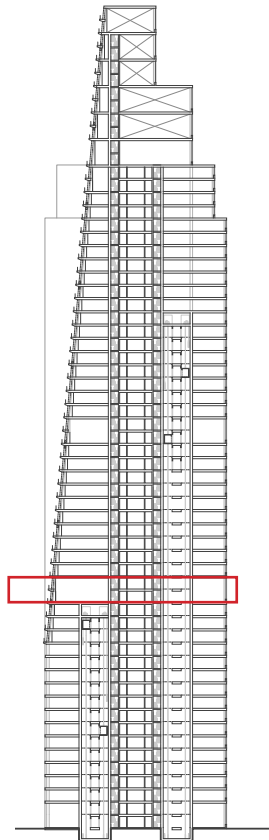
Level 17
12 Units + Gym





Legend

1. Running Track

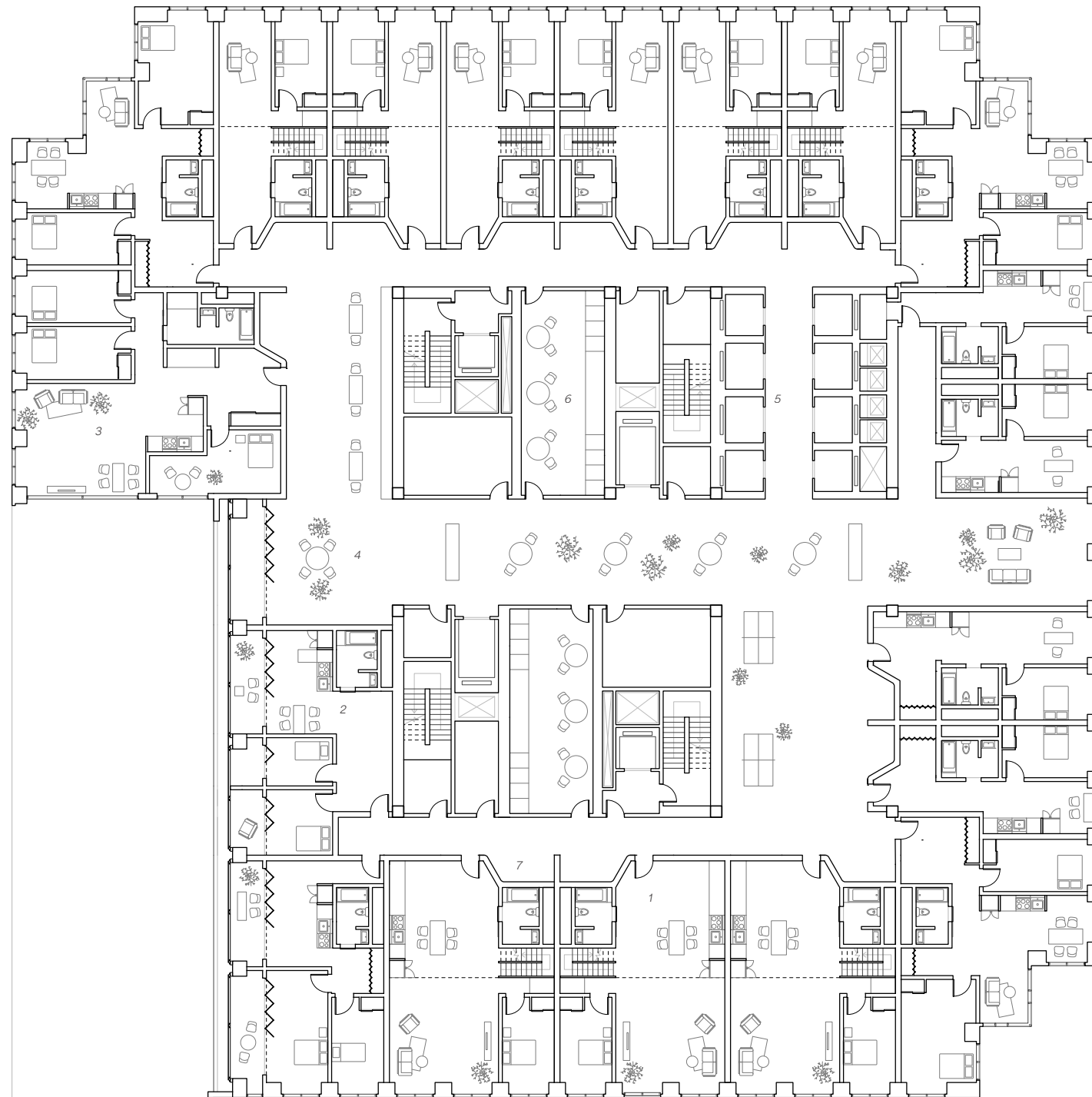
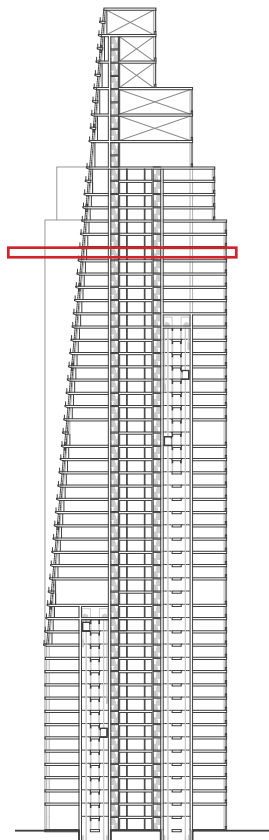


Level 17
12 Units + Gym



Legend

- 1. Town House
- 2. Terrace House
- 3. Flat
- 4. Lounge
- 5. Active Elevator
- 6. Laundry Room
- 7. Bike Storage

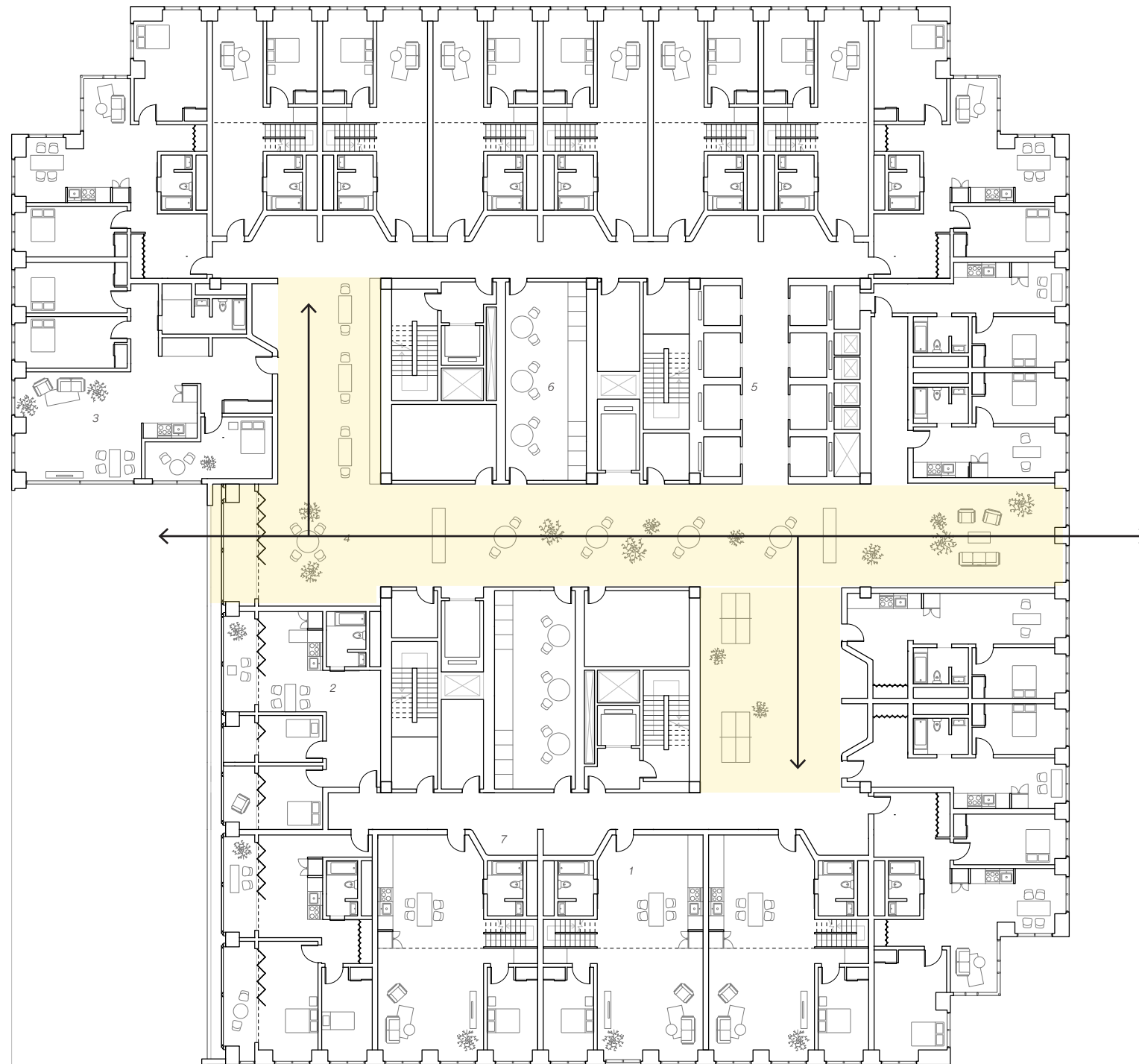
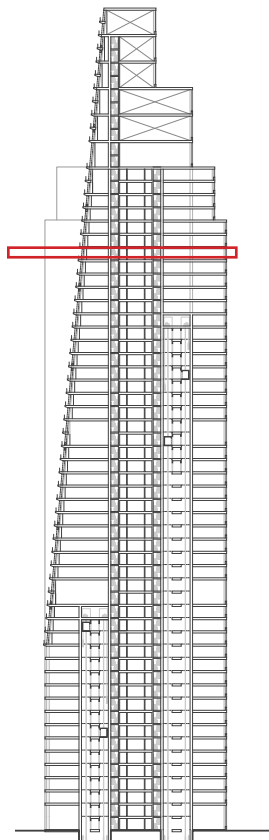


Level 42



Legend

- 1. Town House
- 2. Terrace House
- 3. Flat
- 4. Lounge
- 5. Active Elevator
- 6. Laundry Room
- 7. Bike Storage

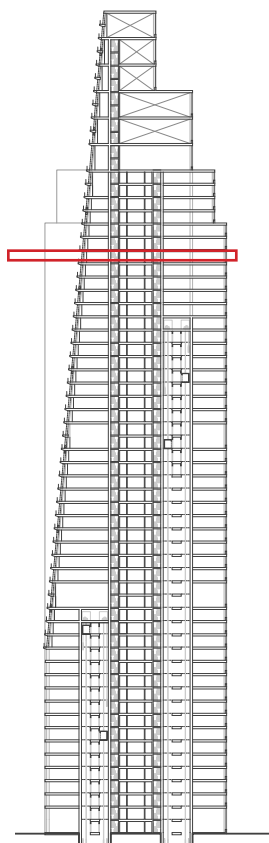


Level 42



Legend

- 1. Town House
- 2. Terrace House
- 3. Flat
- 4. Lounge
- 5. Active Elevator
- 6. Laundry Room
- 7. Bike Storage

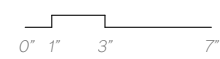
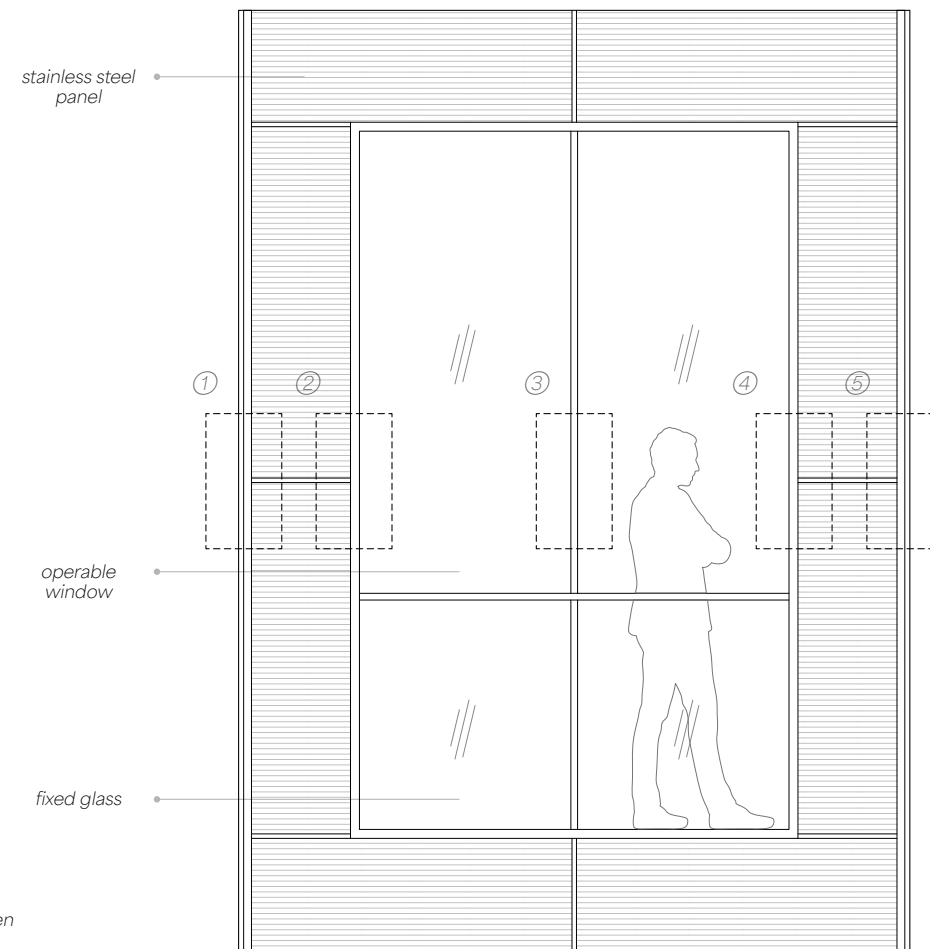
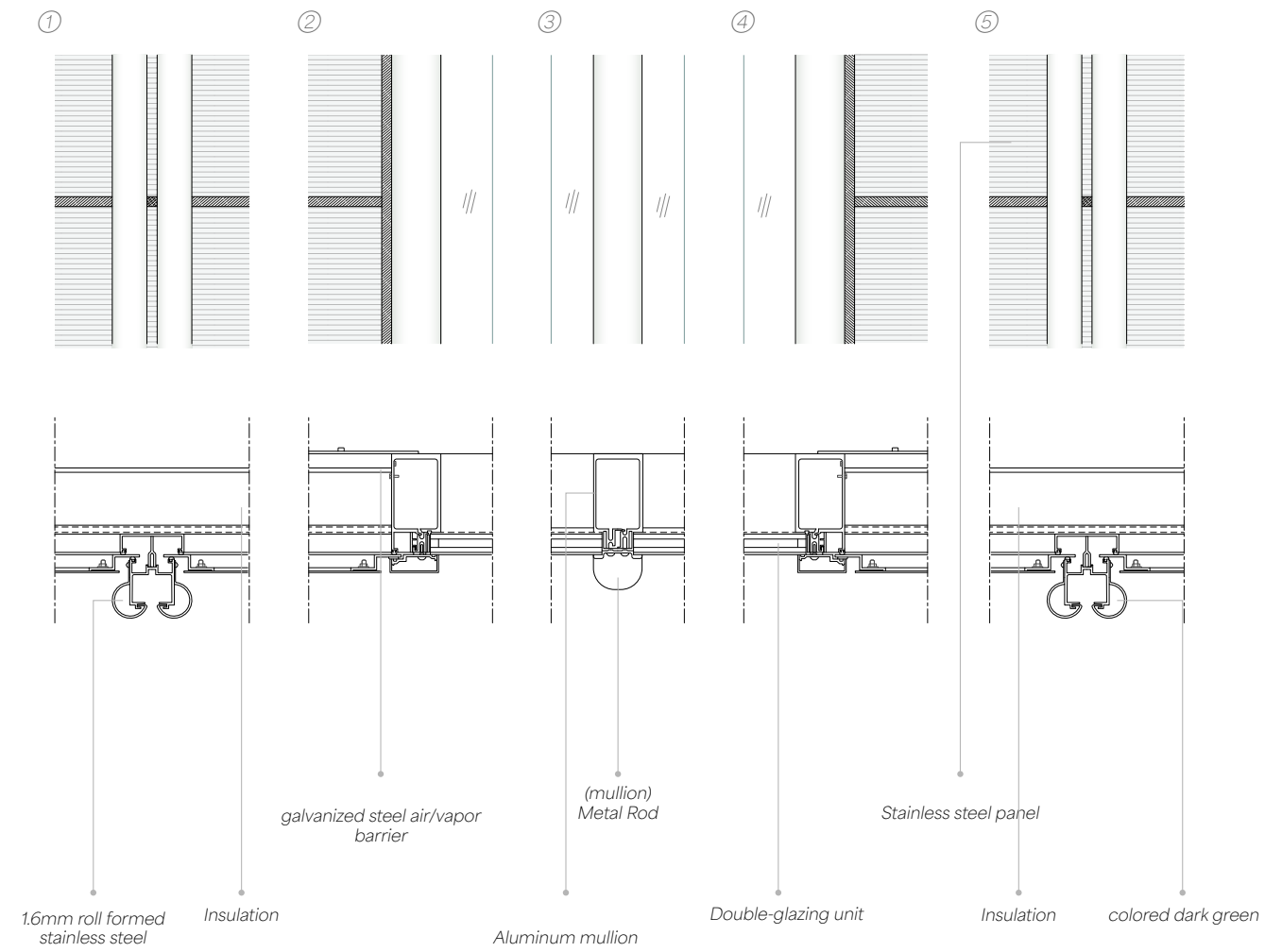


Level 42
19 Units



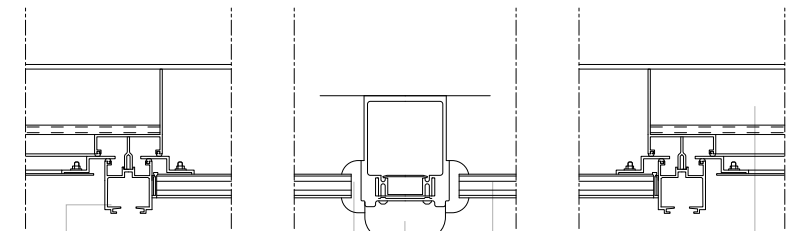
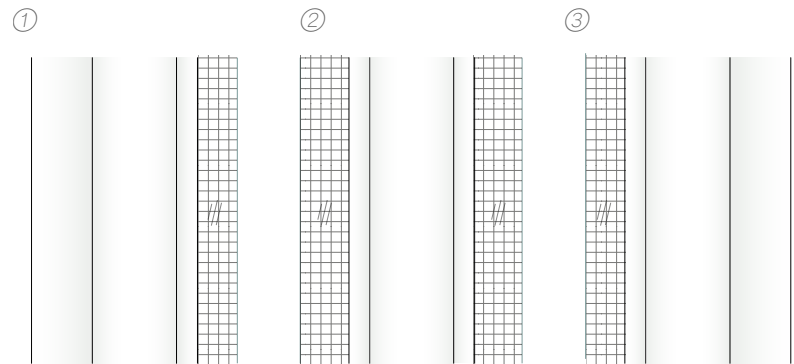


FACADE DESIGN





FACADE DESIGN



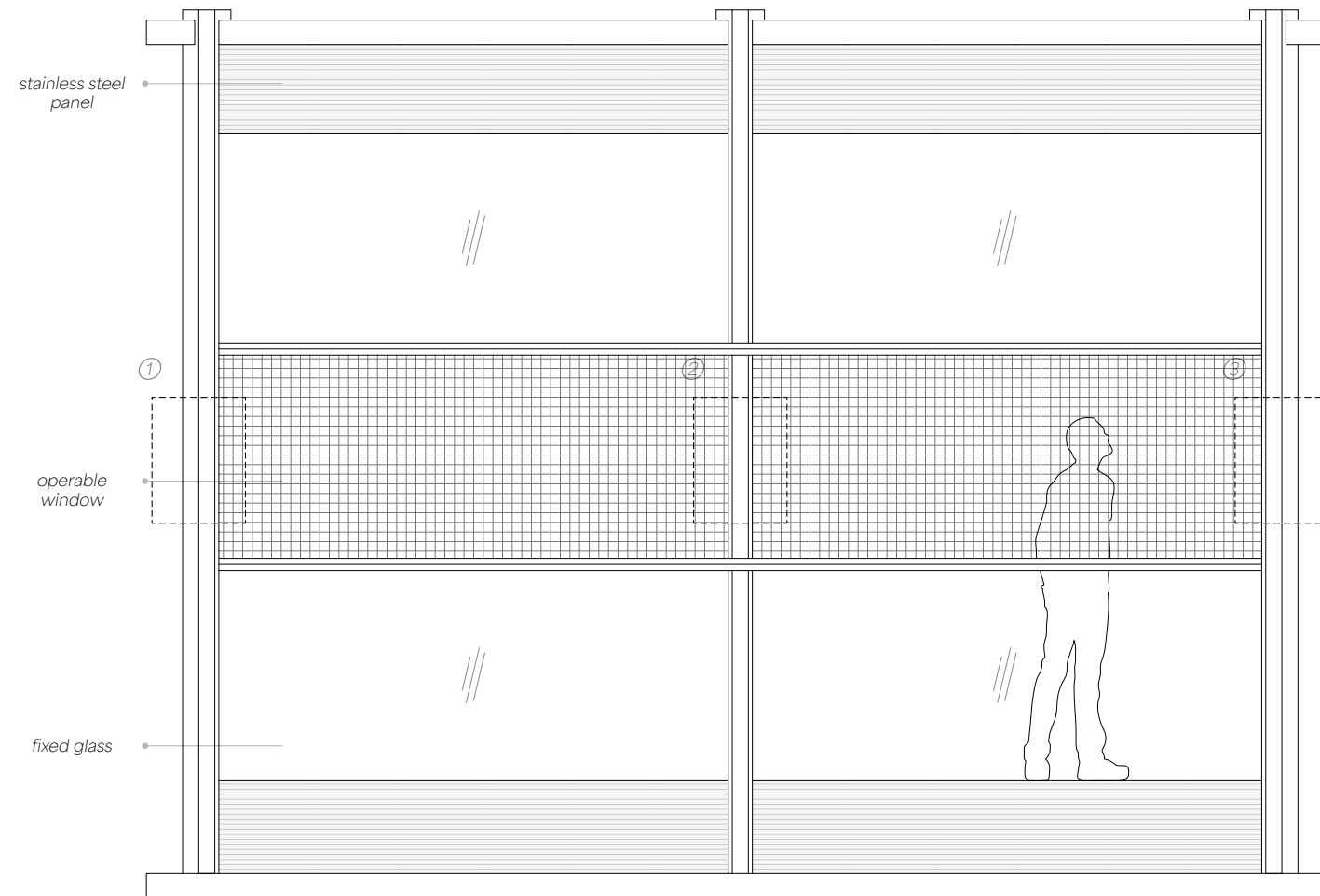
steel mullion

glazing connection

Double-glazing unit

Insulation

(mullion) Metal Rod

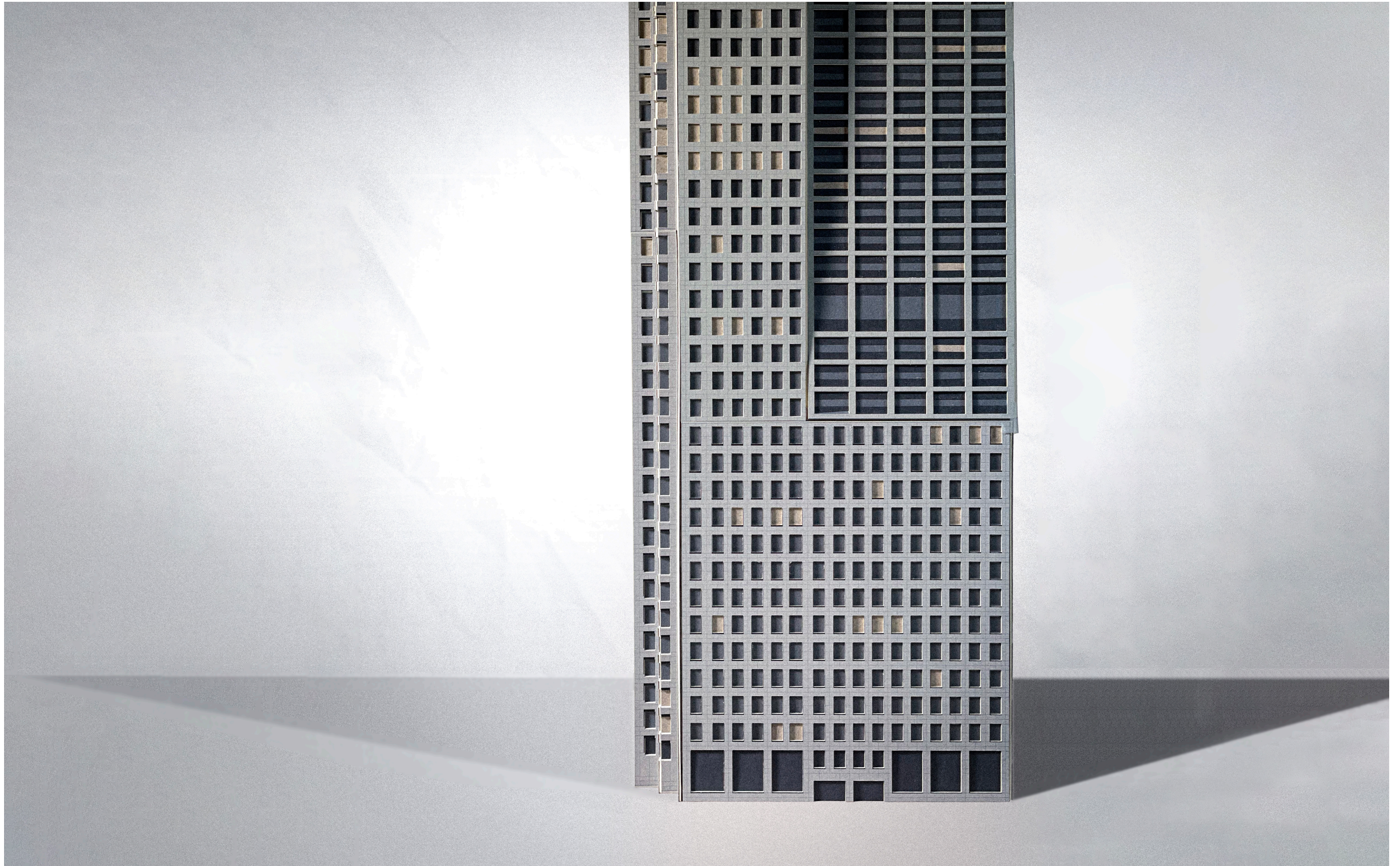


stainless steel panel

operable window

fixed glass

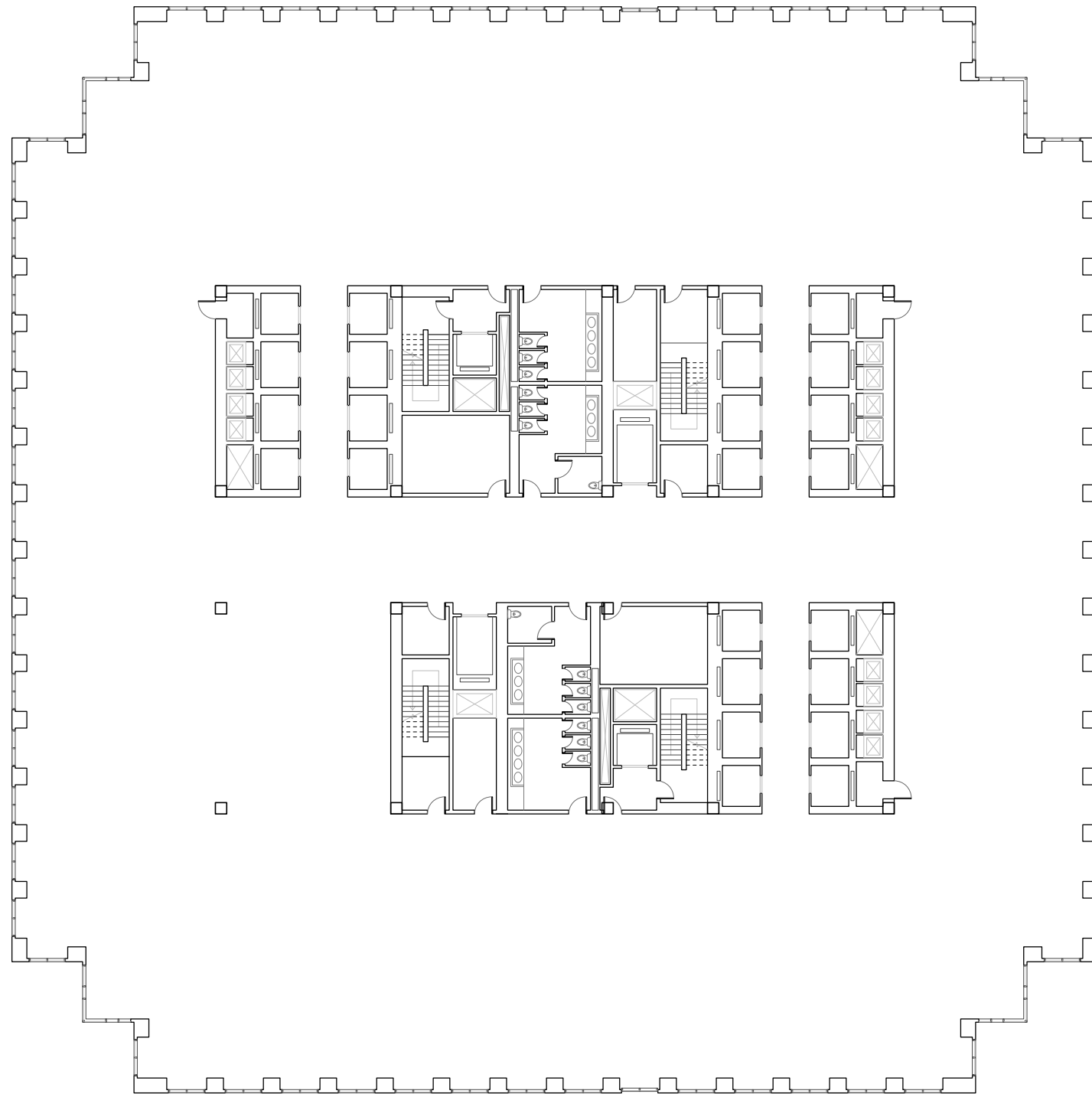




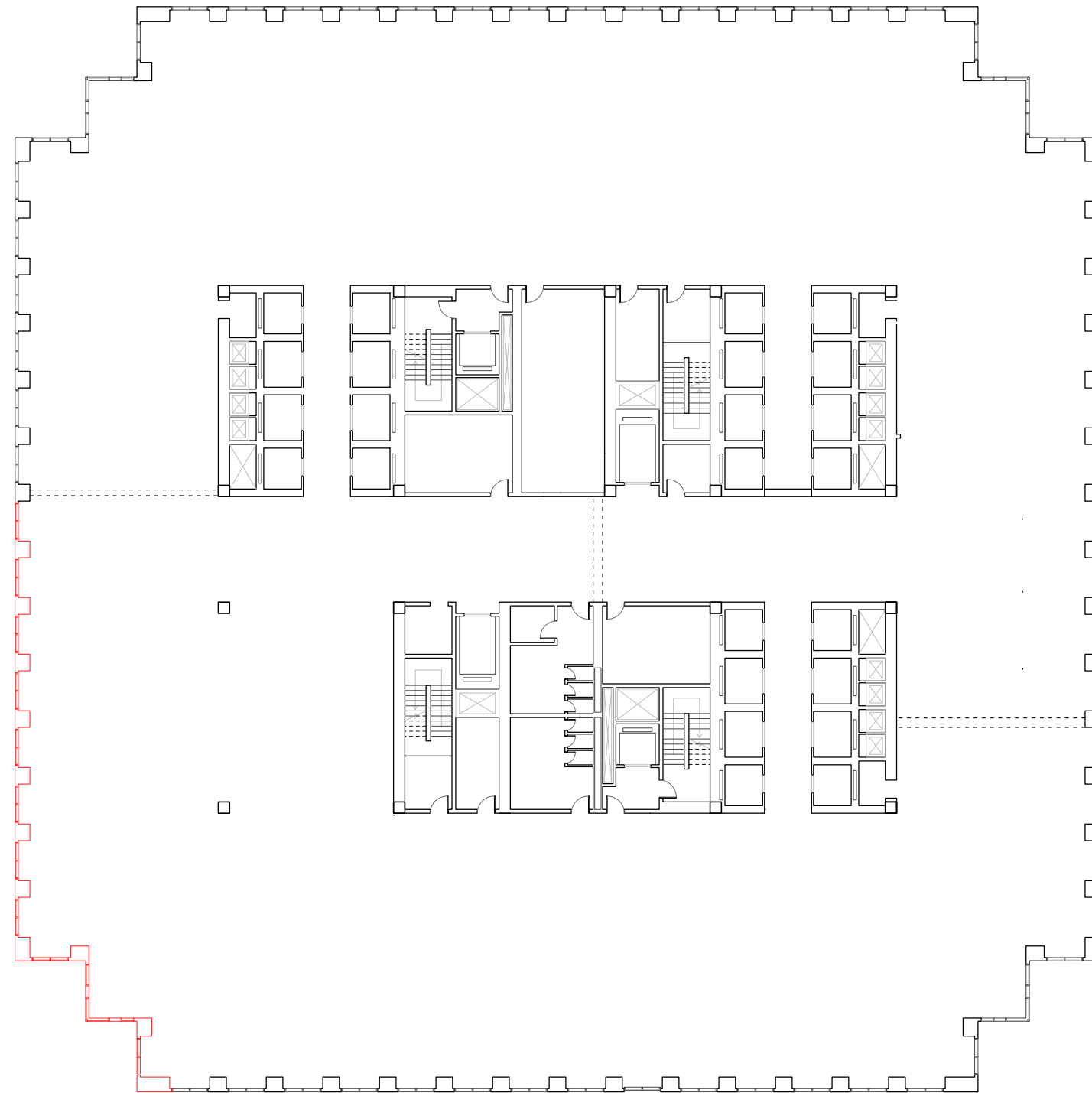
PHASING





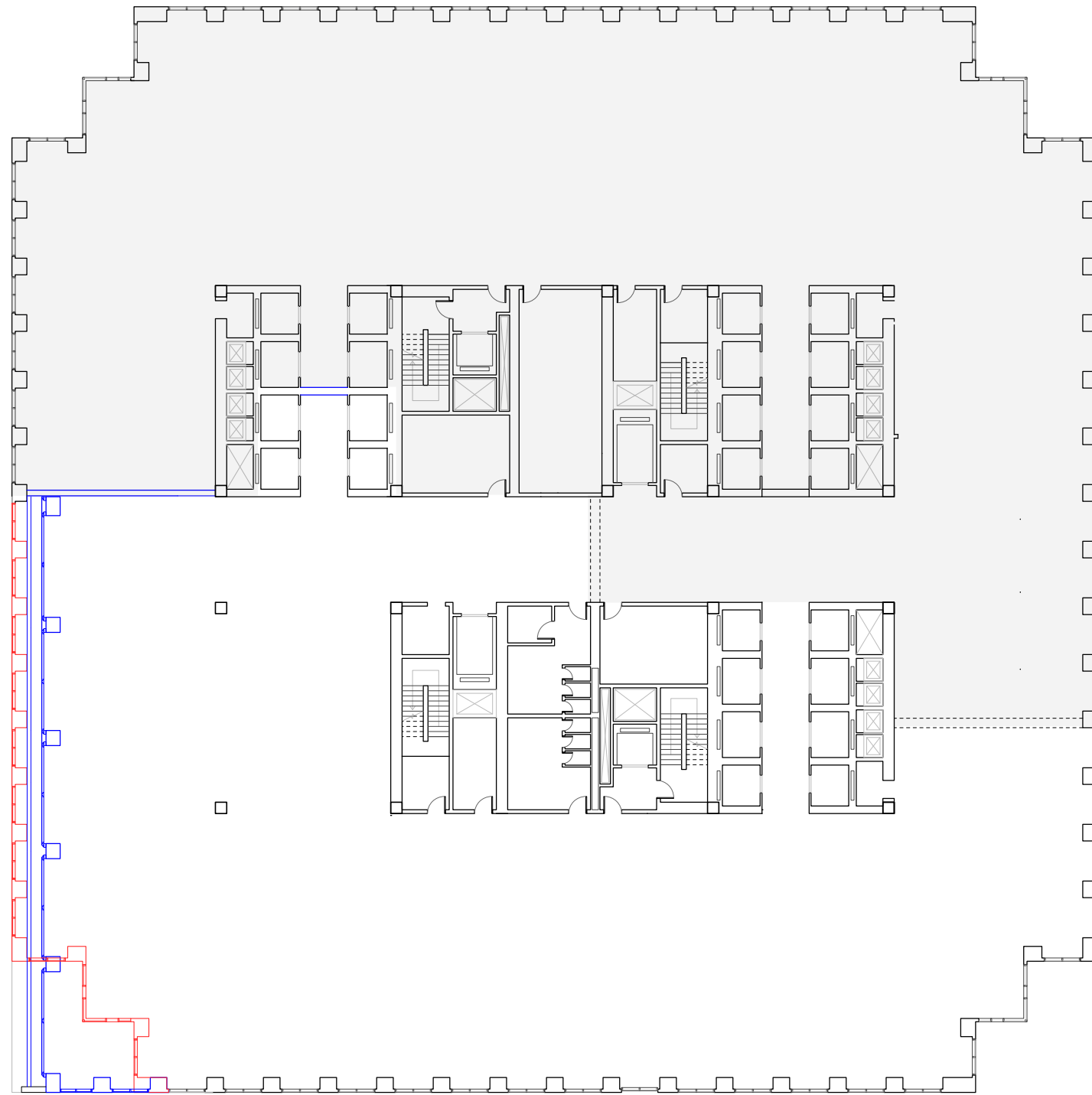


Demolition Plan
Existing Condition



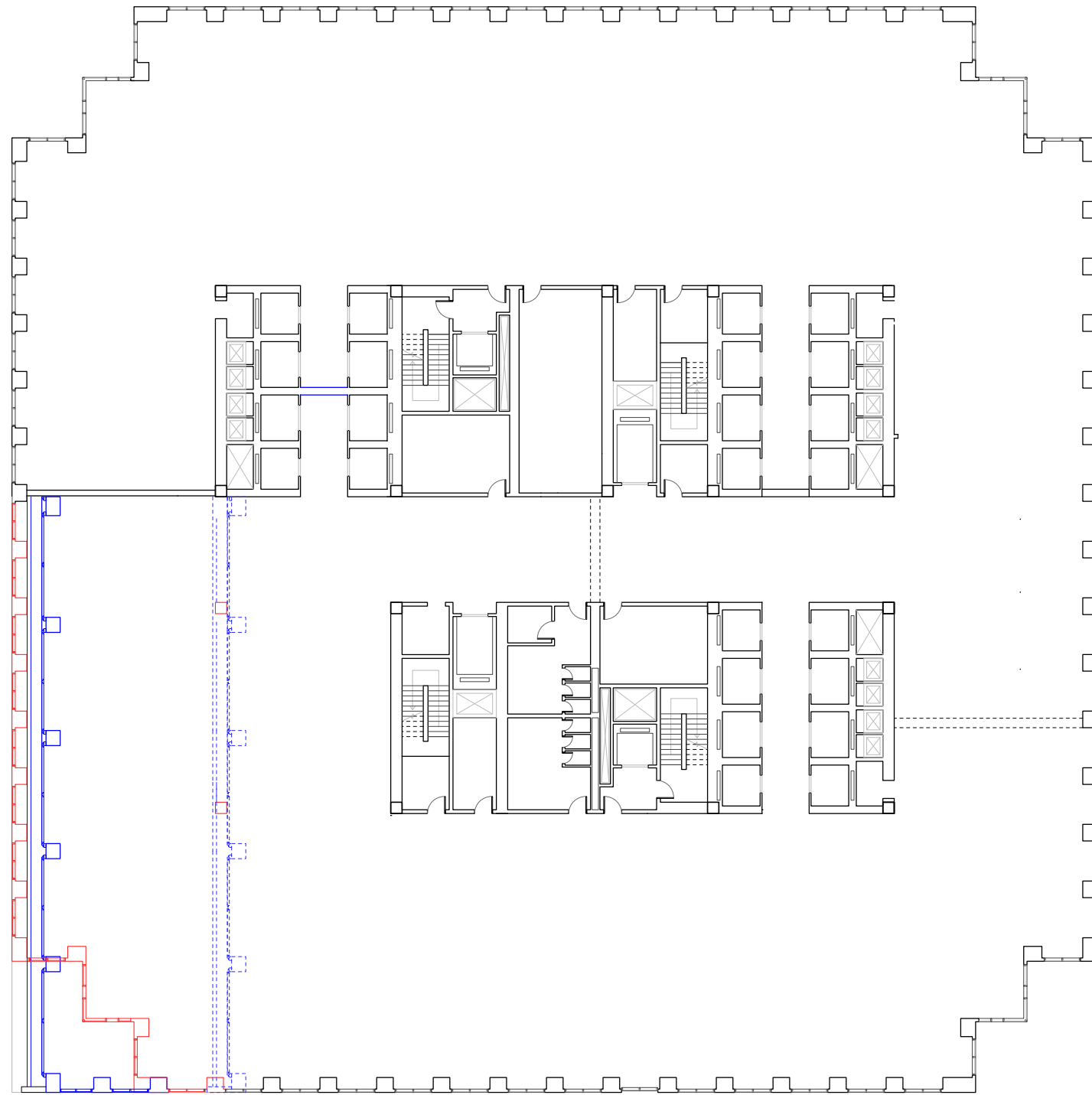
Demolition Plan





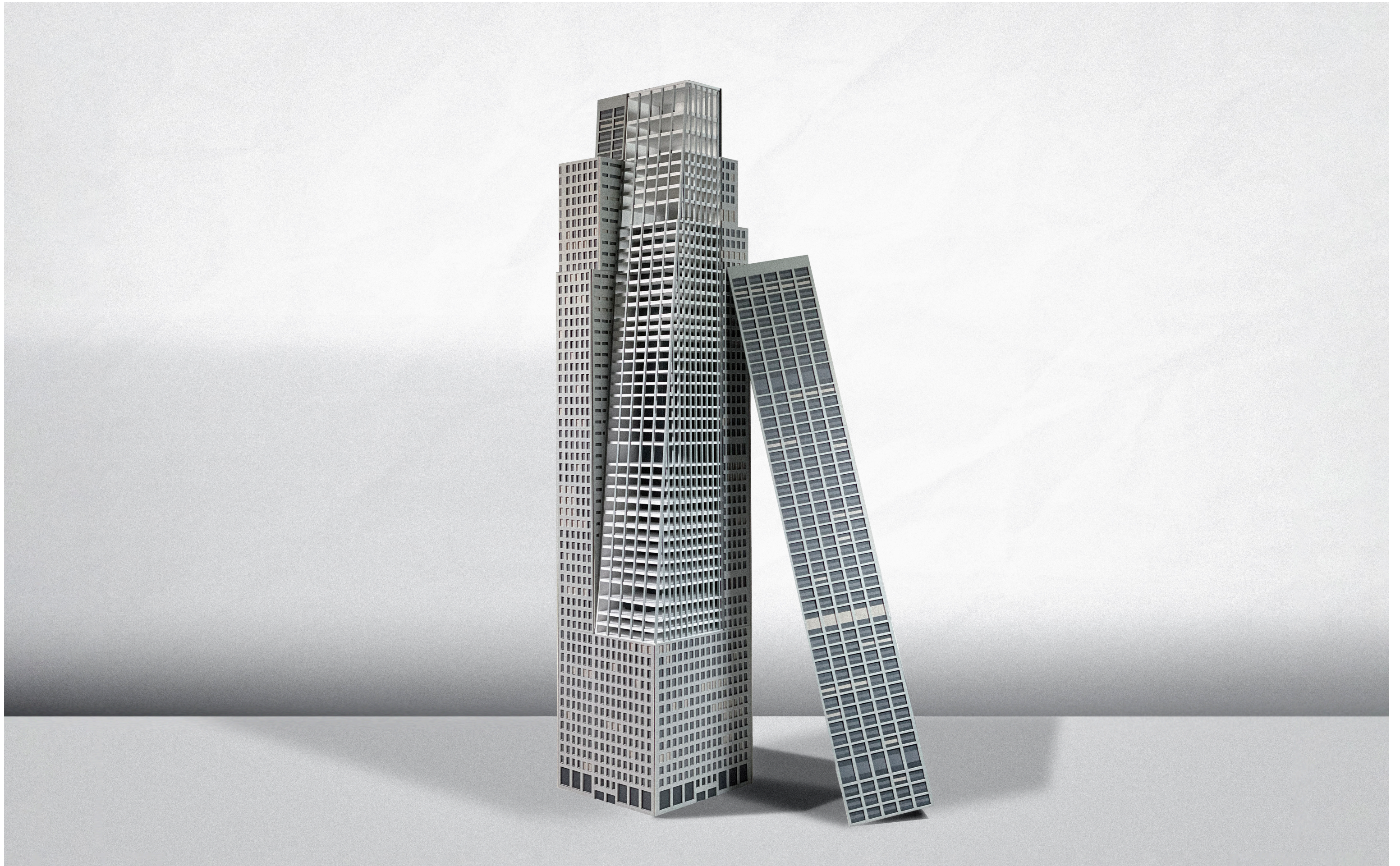
Demolition Plan

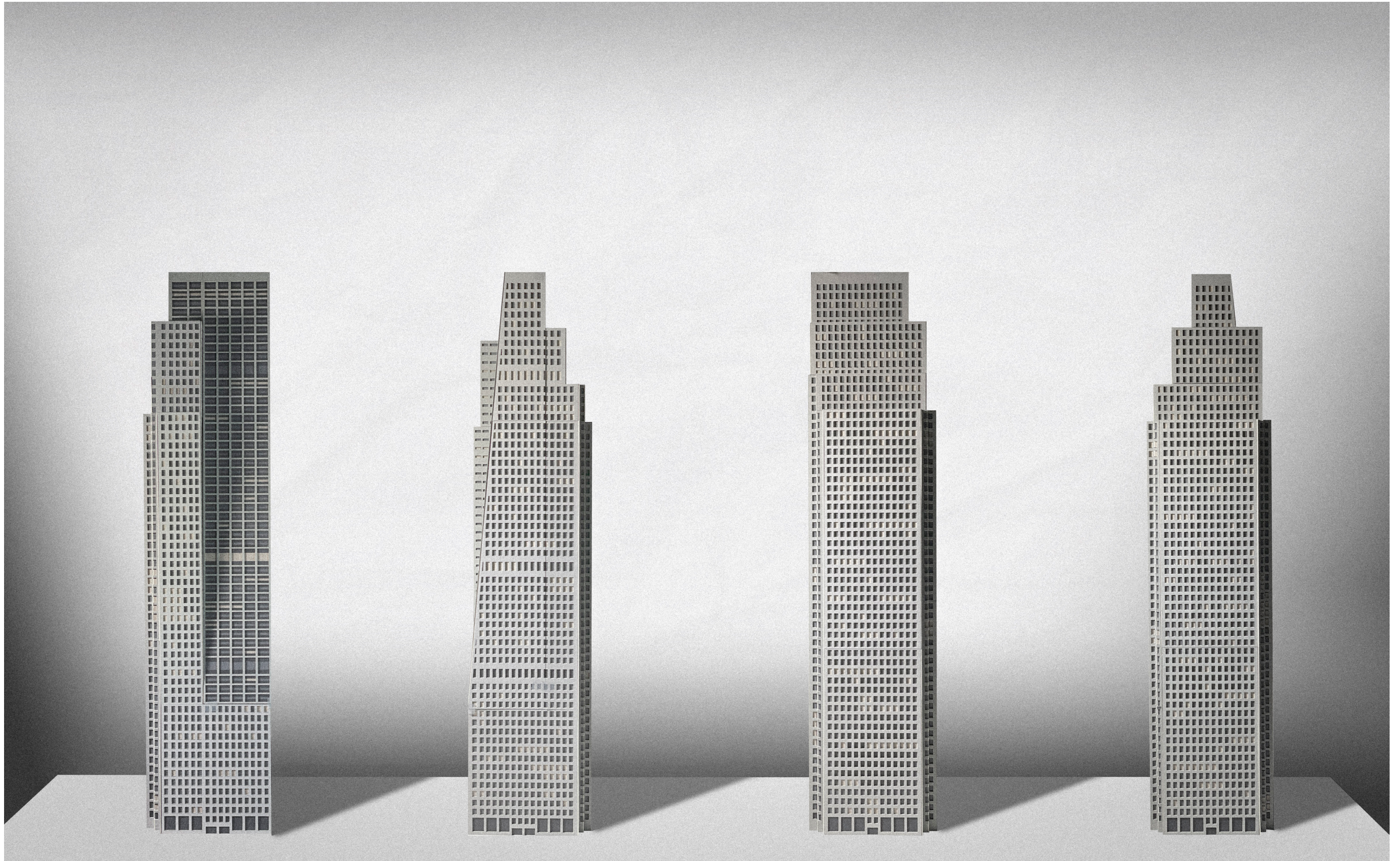




Demolition Plan







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