

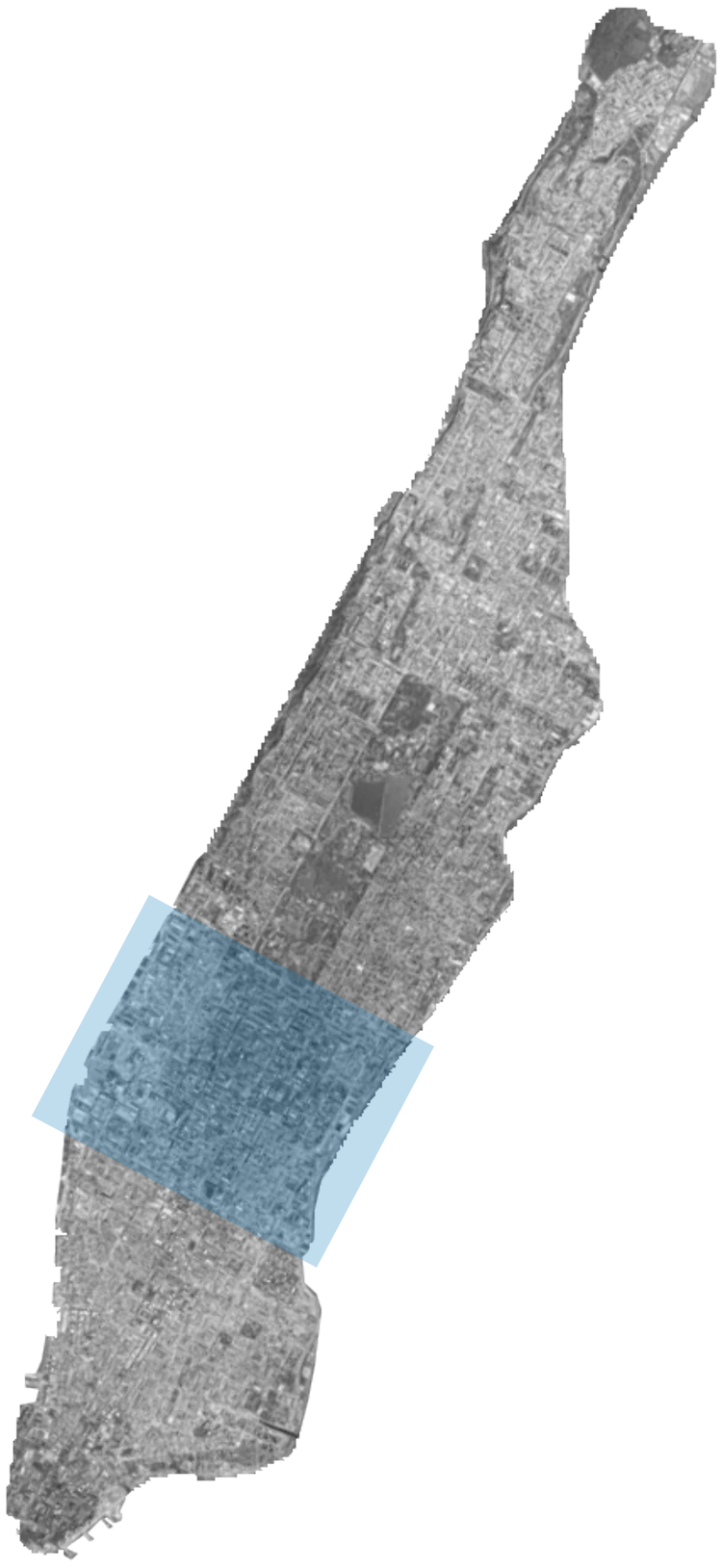
A proposal by Daniel Samaniego Díaz

Mad Heights:
Affordable Housing in Midtown Manhattan

July 1st, 2020
P5 | Complex Projects Midtown NY

Introduction.


New Jersey
THE BRONX
QUEENS
BROOKLYN
STATEN ISLAND



New York City

inhabitants:	8,580,000
size:	1,213.37 km2
GDP:	$807 billion USD
median income:	$63,357 USD
housing units:	3,460,000

Manhattan

inhabitants:	1,660,000
size:	59.13 km2
GDP:	$630 billion USD
median income:	$106,056 USD
housing units:	900,000

Midtown

inhabitants:	300,000
size:	5.84 km2
median income:	$120,854 USD
housing units:	200,000


LIQUORS



>$60,000 USD per month


Clicquot Club
DYNO
QUICK
QUAKER OATS
BON AMI
LINIT
BIG Y
PEARS

23 Street Station
Uptown & Queens

R V

HOMELESS VETERAN!!
Hungry, COLD NEED
$45 TO RENT A ROOM FOR A NIGHT
HELP
ANYTHING
HELPS

Housing Affordability CRISIS!

NYC AFFORDABLE HOUSING | NEWS | NYC RENTAL MARKET REPORTS

NYC's housing crisis accelerating as low-rent apartment stock declines: report

8

A new report from Comptroller Scott Stringer reveal that the city's stock of low-rent apartments continue to diminish

By Ameena Walker | Sep 26, 2018, 11:14am EDT

NEWS BROOKLYN BORO

NYC's housing supply can't keep up with its job growth: report

Welcome to New York City, where you may have a job, but not a home.

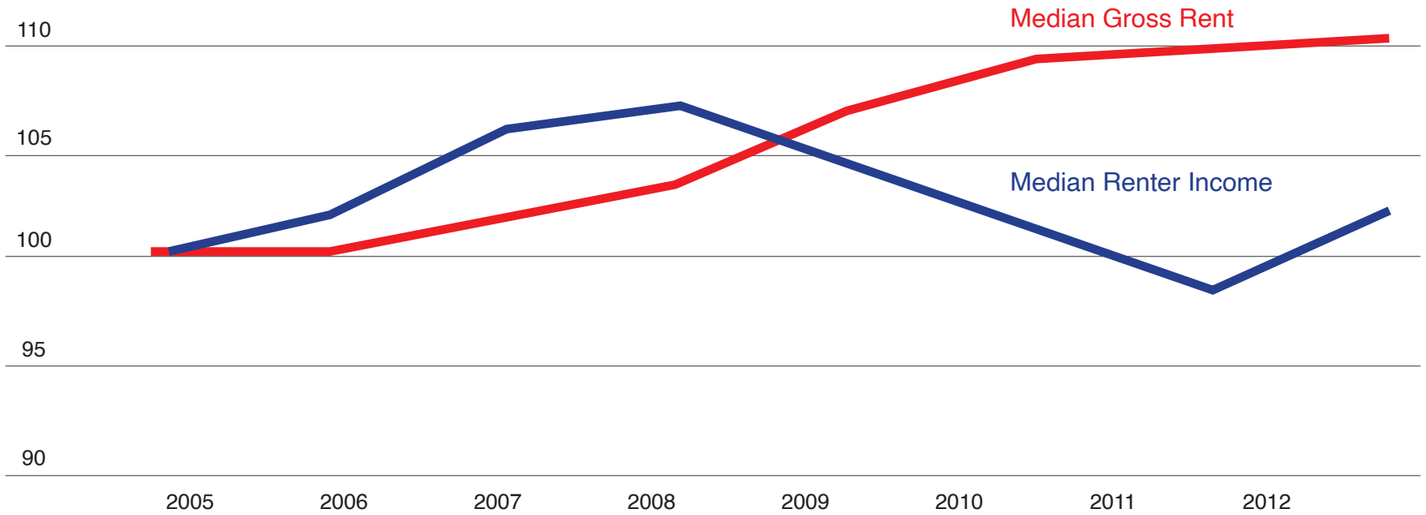
November 8, 2019 Kelly Mena and Victoria Merlino

The Disappearing 3-Bedroom: Larger Families Have Few Affordable Options in NYC

AUTHOR
Rachel Rippetoe

DATE
July 2, 2019

Index of NYC Median Gross Rent and Renter Household Income



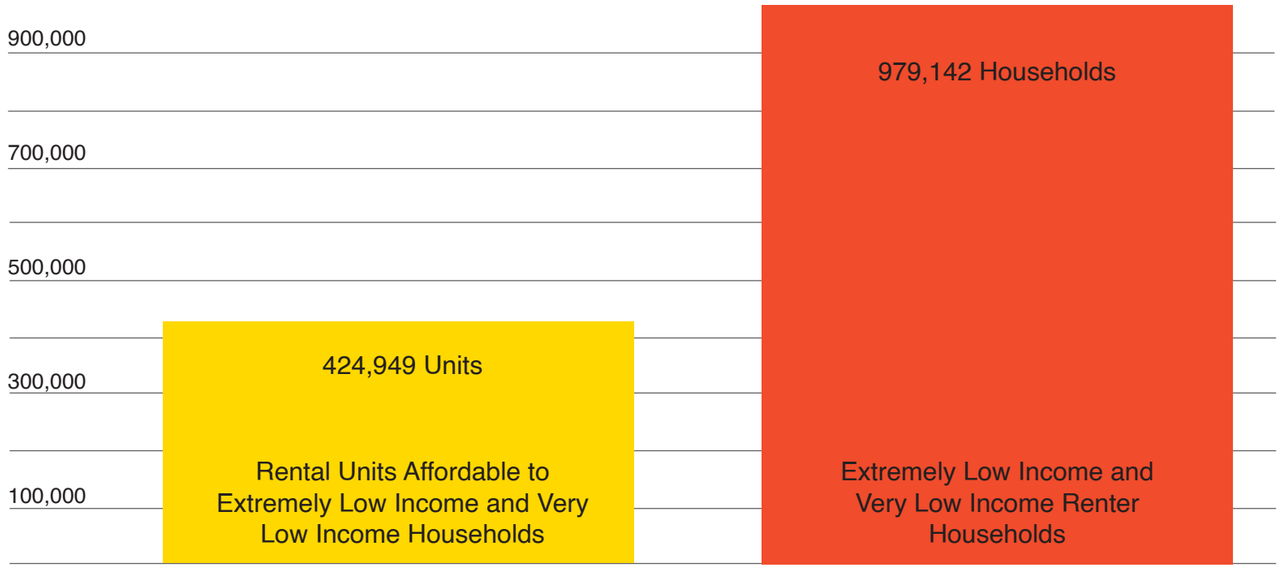
Median rents have risen, but median incomes have remained stagnant.

Source: 2005-2012 American Community Survery; Bureau of Labor Statistics CPI-NYC.



High demand on housing and high cost of living have caused housing rents to be less affordable to lower income residents.

Supply and Demand among Extremely Low Income and Very Low Income Renter Households



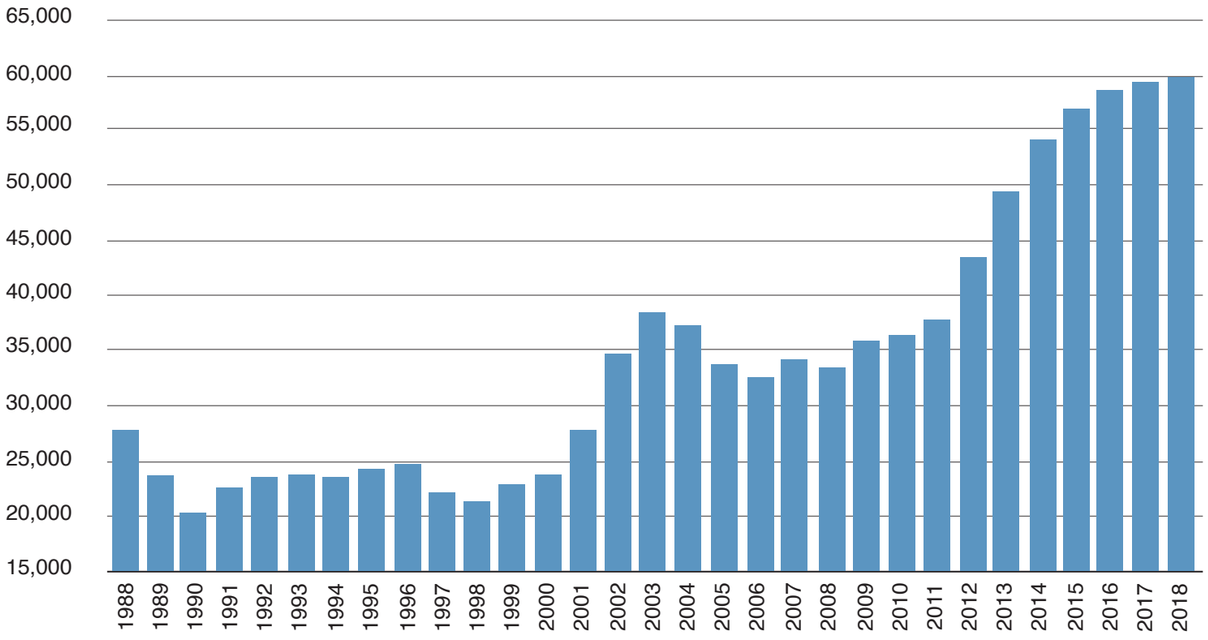
There are more than two Extremely Low Income and Very Low Income households for every one housing units that is affordable to them.

Source: Housing and Vacancy Survey (US Census), 2011.



The current affordable housing has not been effective in providing quality for its residents and do not meet demand.

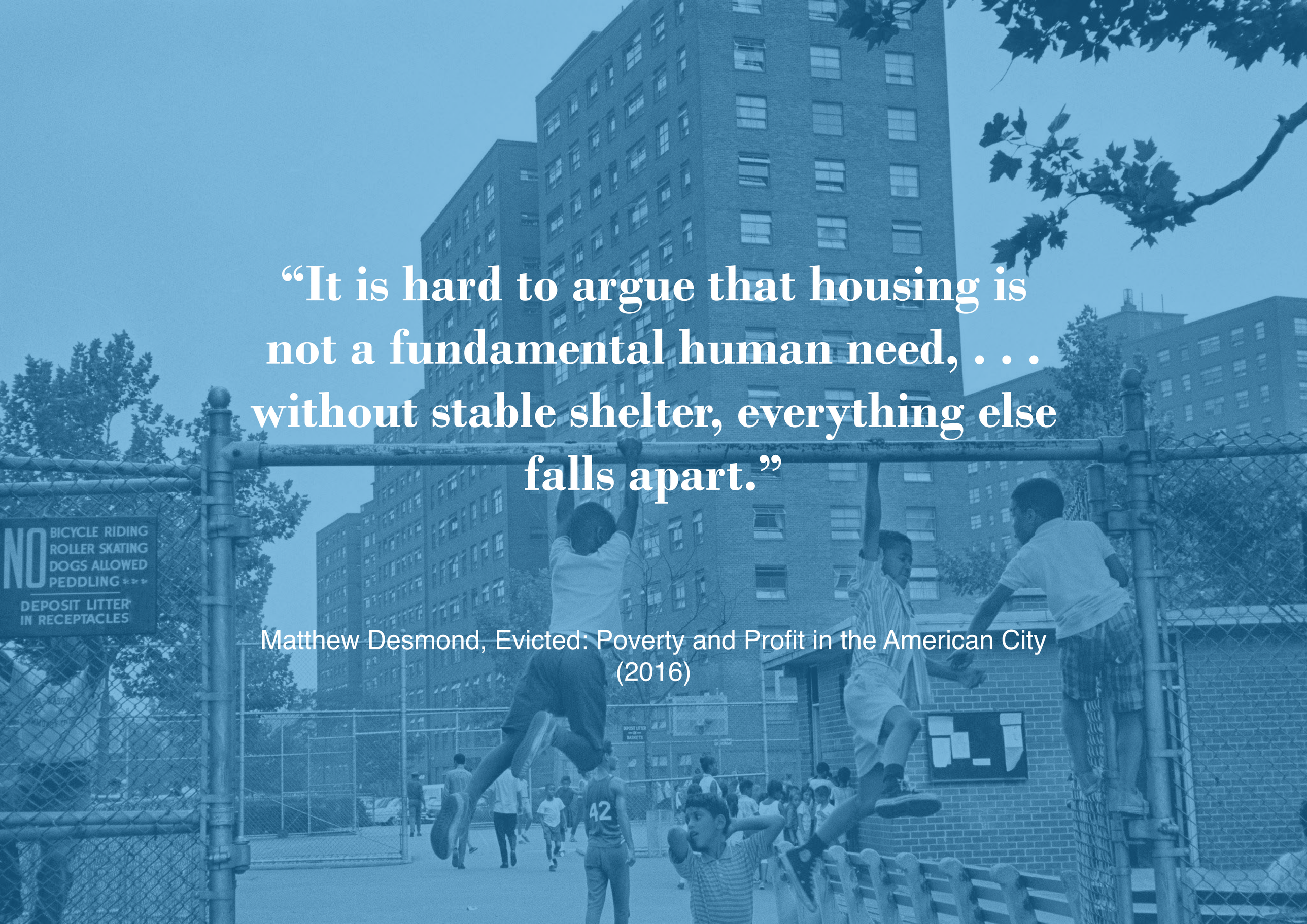
Average Nightly Homeless Shelter Census, 1988-2018



Source: NYC Department of Homeless Services.



NYC Homeless levels rise for tenth consecutive year.

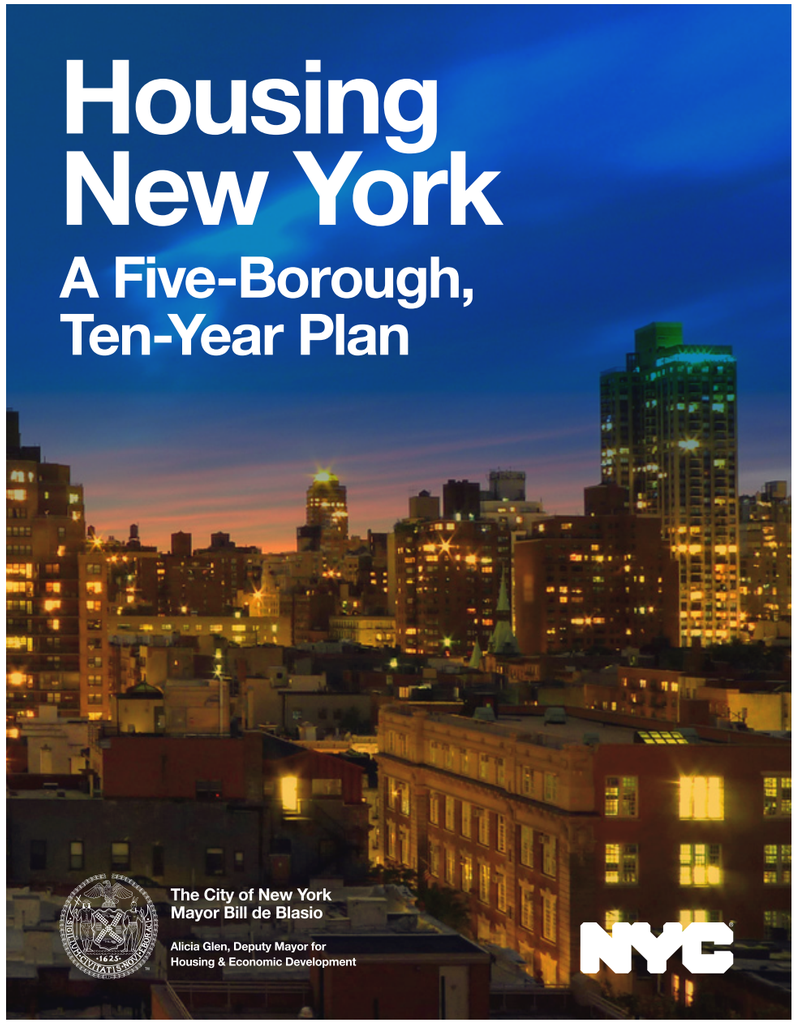


“It is hard to argue that housing is not a fundamental human need, . . . without stable shelter, everything else falls apart.”

Matthew Desmond, Evicted: Poverty and Profit in the American City (2016)

NYC Government Taking Action





41.4 Billion USD Investment





Affordable Housing Tendencies

1950



Franklin Plaza Apartments, Harlem, Manhattan.

2020



Hunters Point South, Queens

How to Make Affordable Housing Work Effectively Within the NYC Housing Market System?

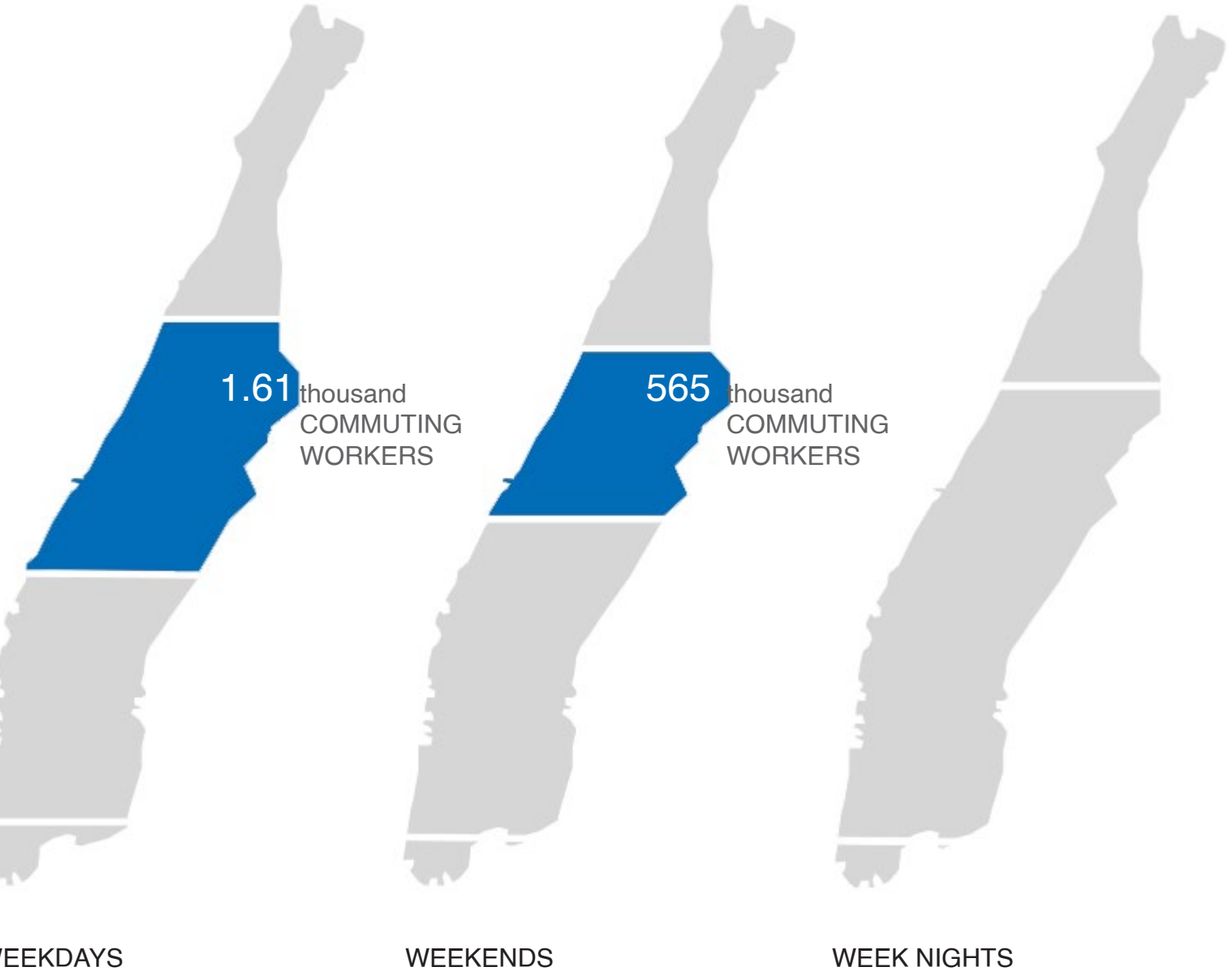
What design guidelines and urban considerations could facilitate the provision of affordable housing?



Reconsideration of housing and dwelling: Who are the actual dwellers of Manhattan? How do they dwell? How can design respond to this?



Dwellers of Manhattan



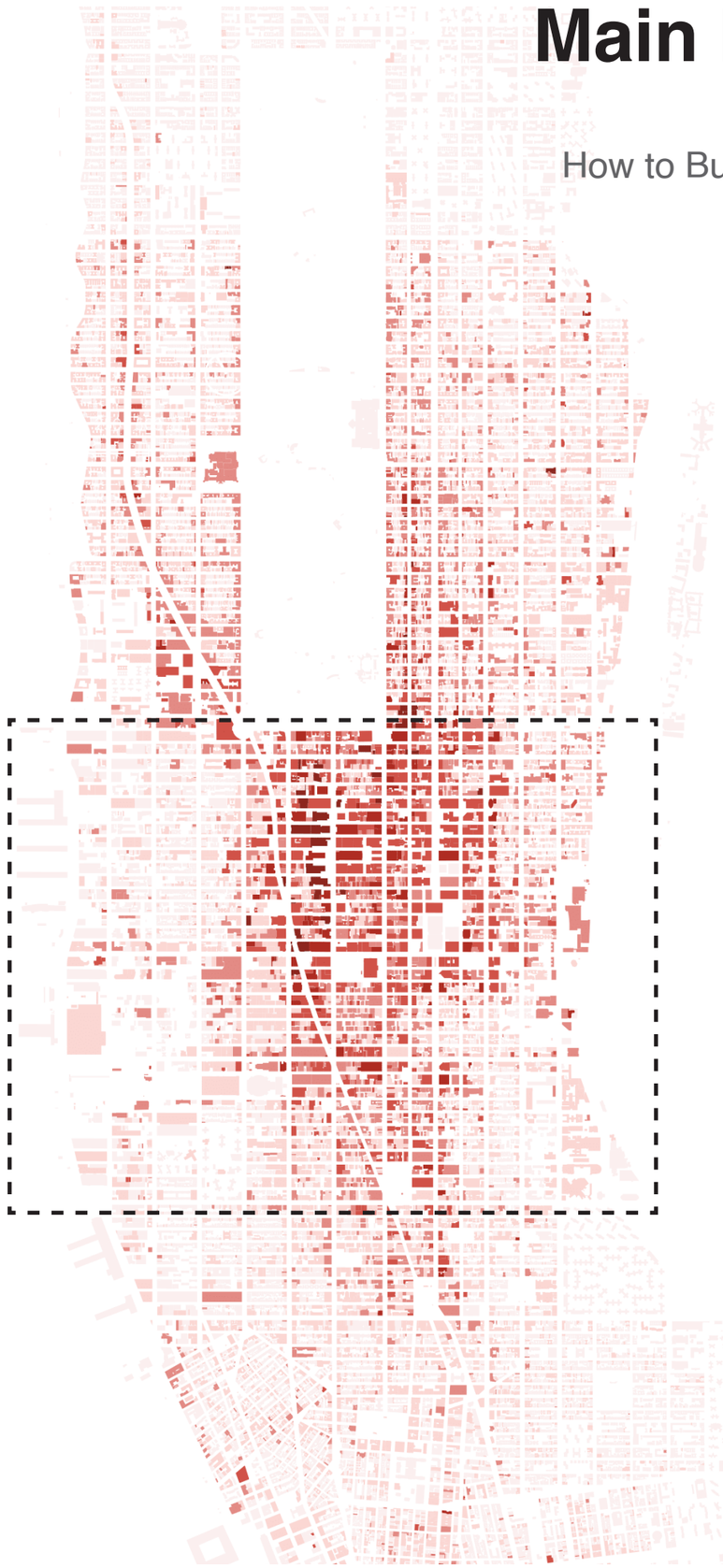




“[housing/jobs imbalance] would be expected to heighten AFFORDABILITY CHALLENGES and create headwinds to further BUSINESS GROWTH.” NYC Plannning, October 2019.

Main Problematic

How to Build on Expensive Land?



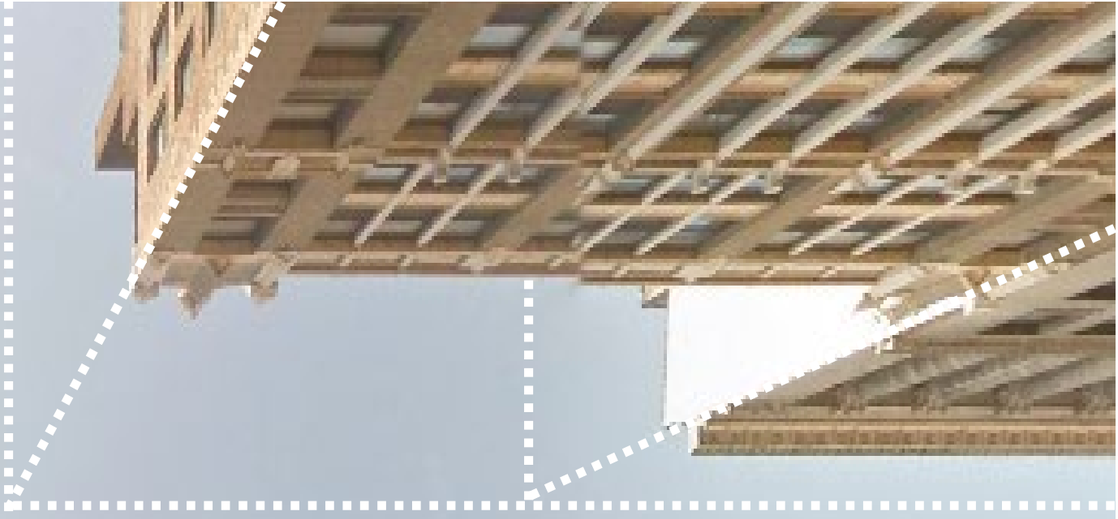
Land Value Per Square Foot (USD)

- $ 1,500 <
- $ 1,000 - 1,500
- $ 500 - 1,000
- $ 250 - 500
- $ 250 - 100
- < $ 100

What About the Air?







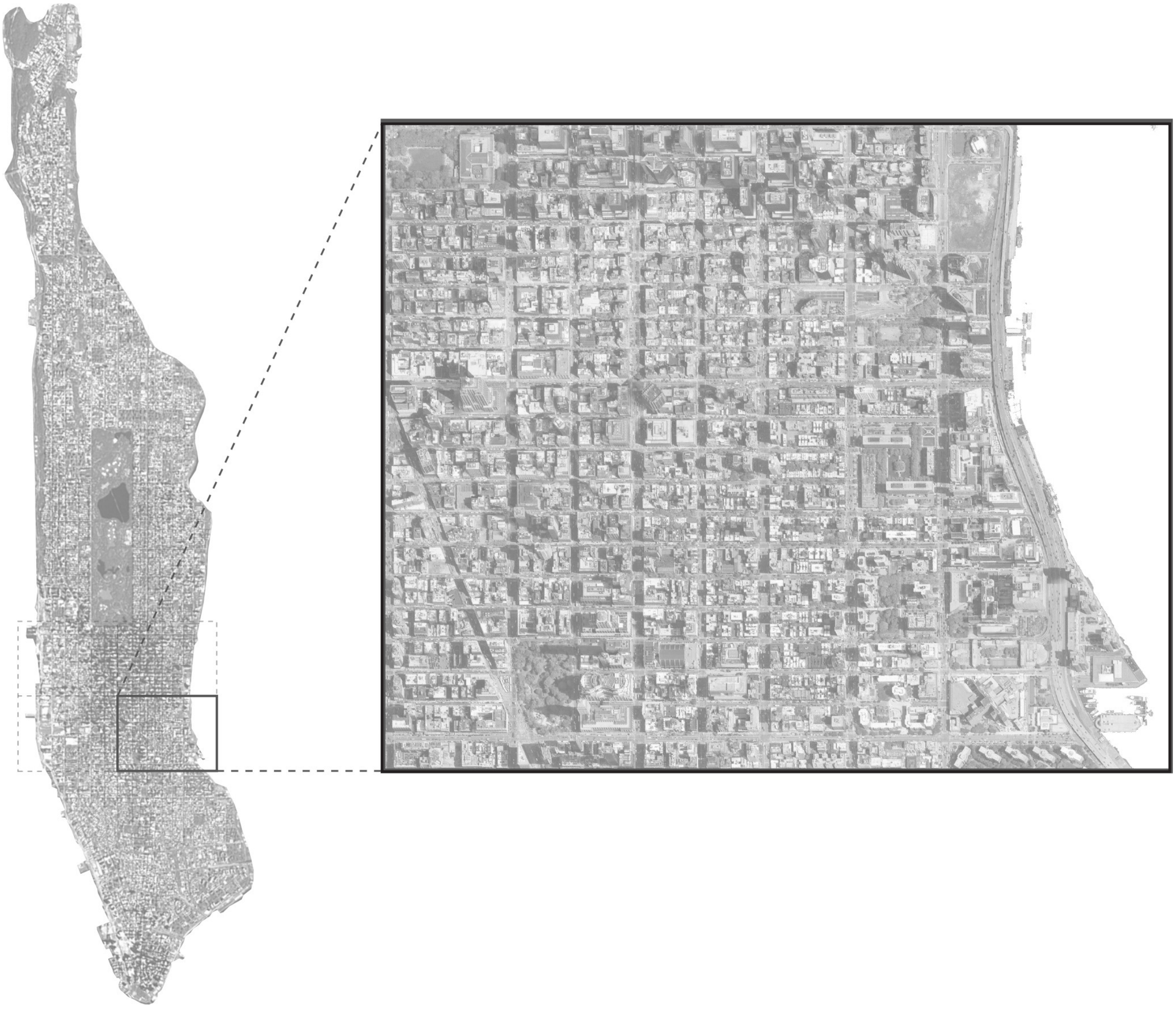
3.7 Billion Square Feet of Unused Air Space



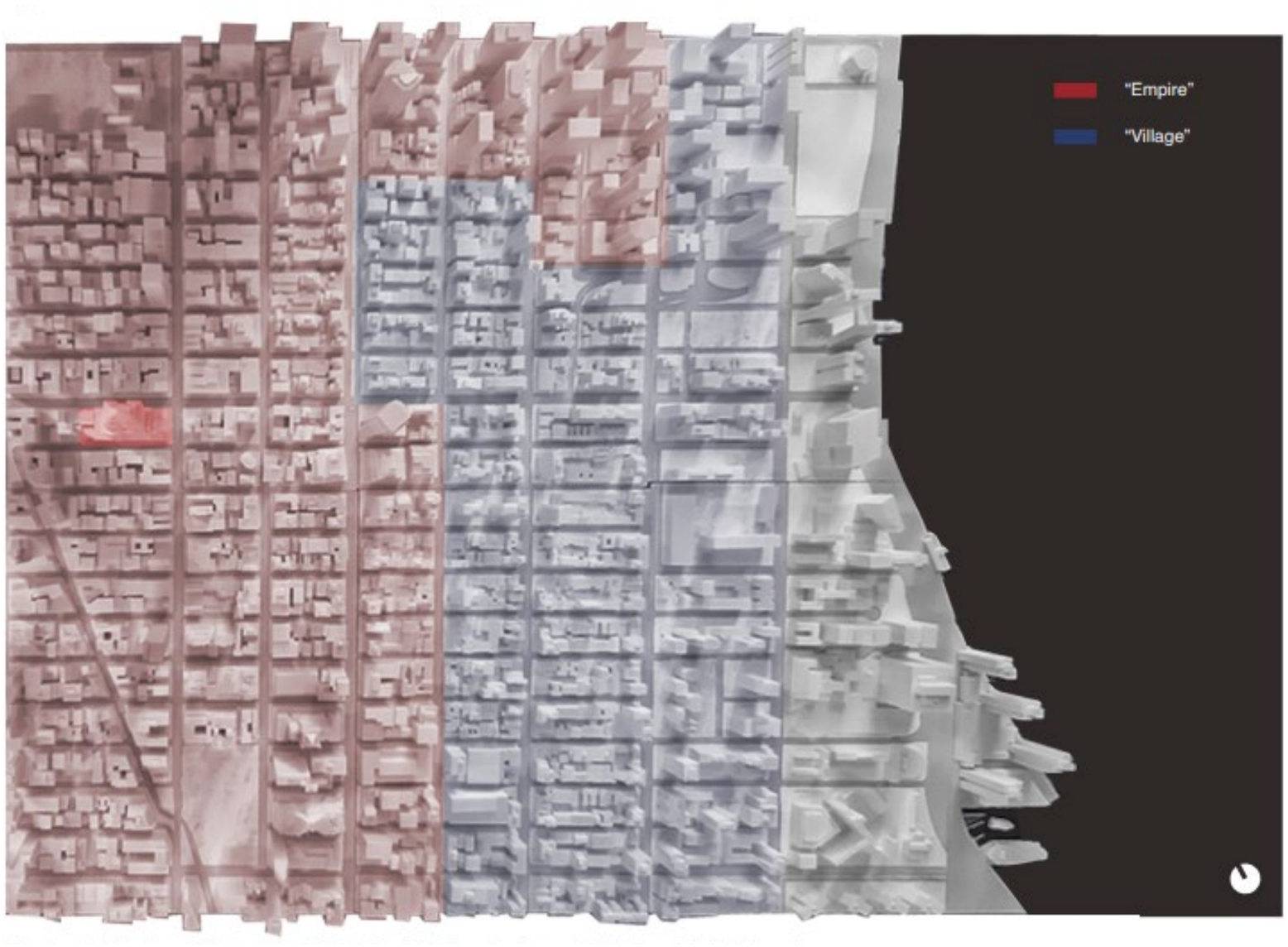


= More than a Million HOUSING UNITS

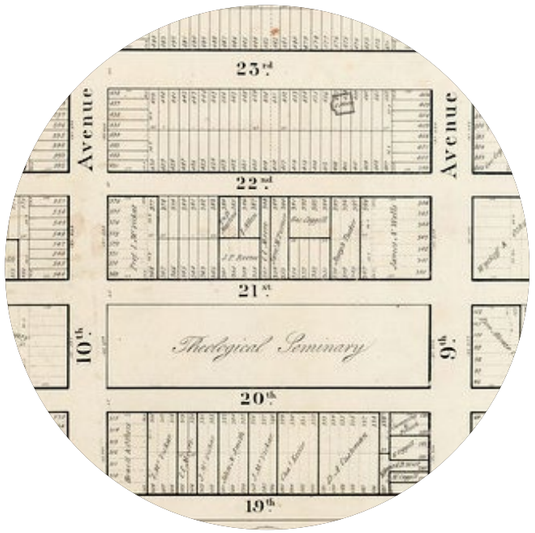
Site + Group Strategy.



Empire Village


"Empire"
"Village"

Group Focus


23d.
Avenue
22d.
21st.
10th.
Theological Seminary
9th.
Avenue
20th.
19th.

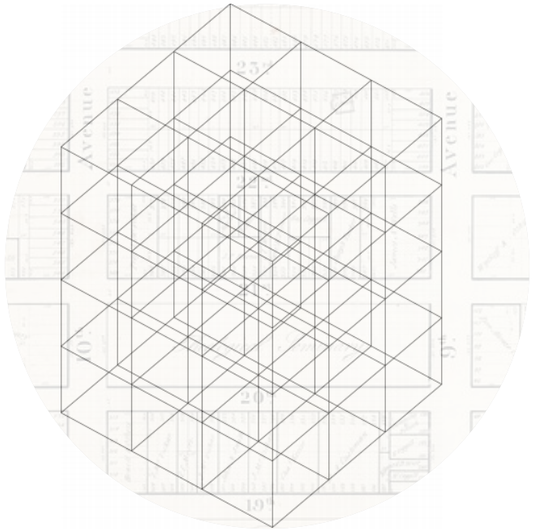
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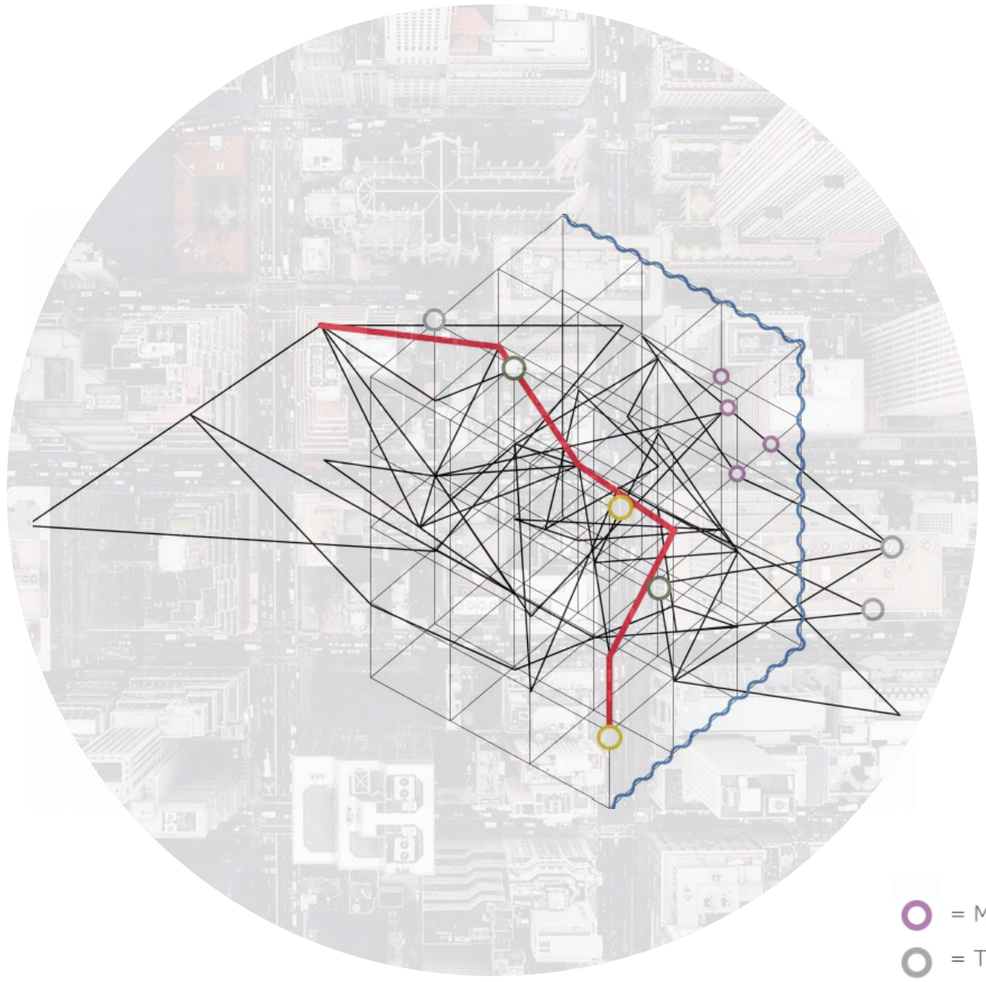
Group Focus



+



=


= Medical City
= Transport
= Public Space
= Iconic Building
= 5th Avenue
= Coastline

Empire Village Challenges

Demographic growth: residents & commuters



High social segregation



Aging infrastructure



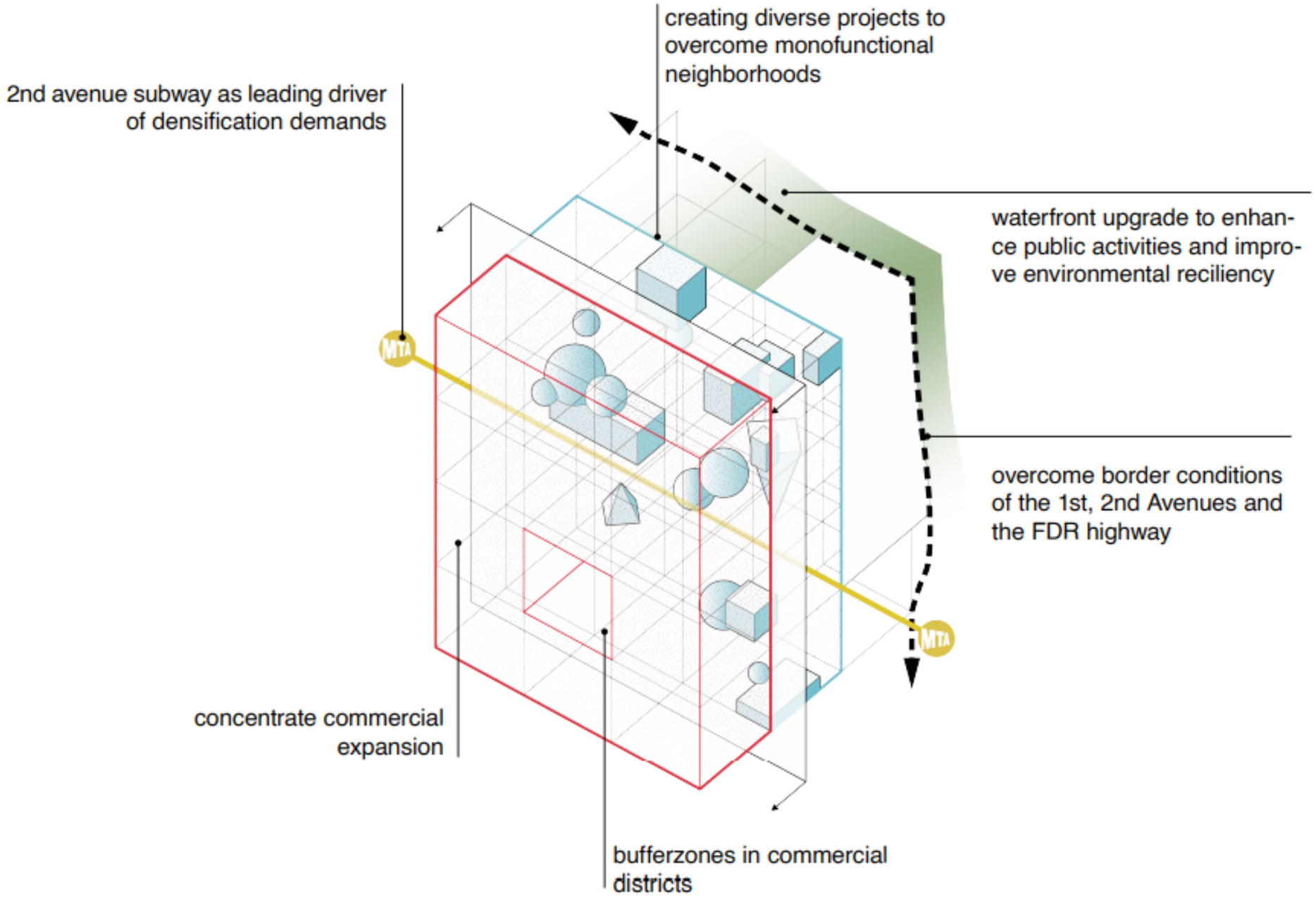
Rising costs of rent



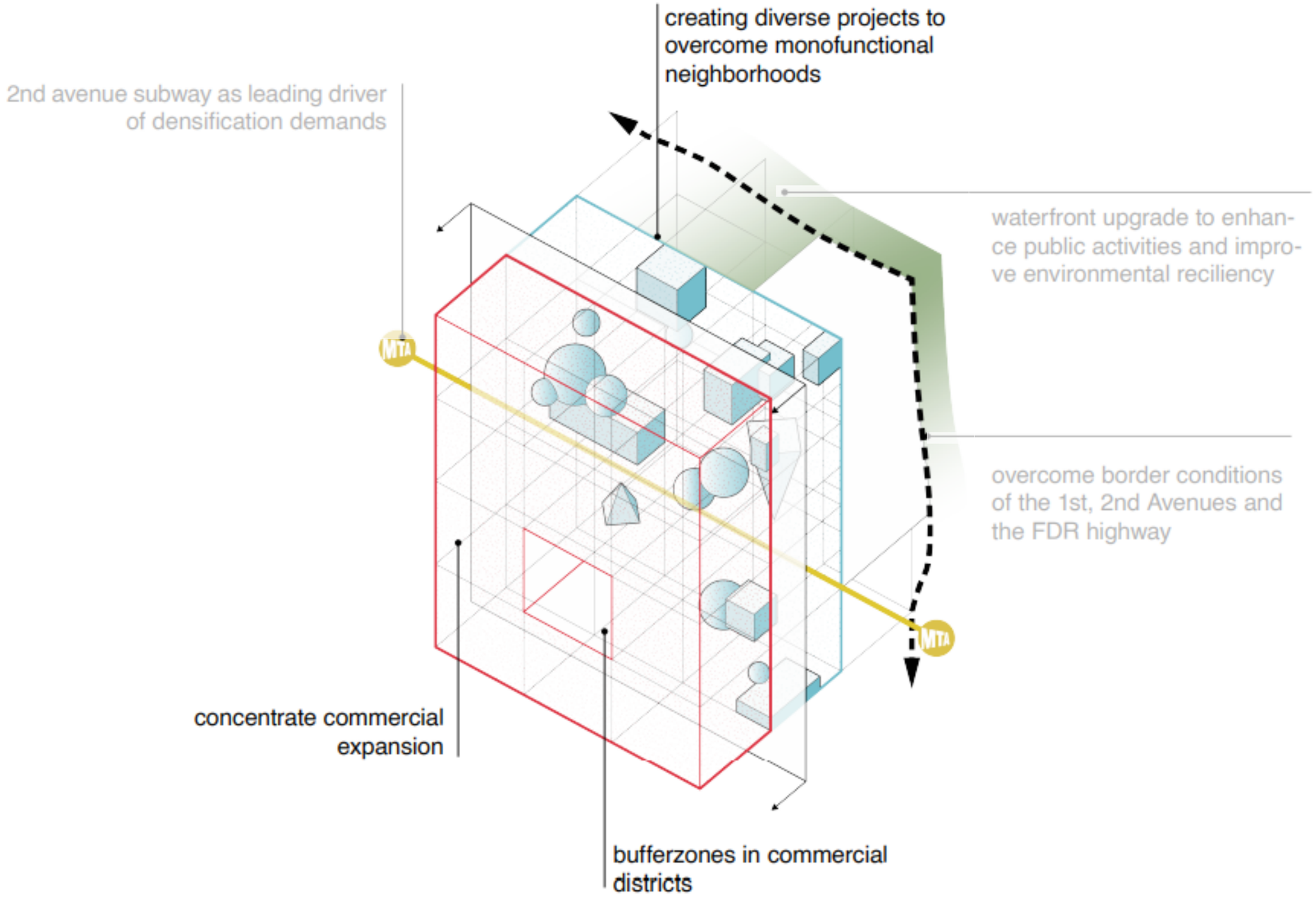
Displacement of small-scale businesses and buildings by advent of massive infrastructural developments



Group Strategy



Personal Focus





Lack of affordable housing: Main pressing issues expressed by residents of community districts #5 & #6

Lessons for Affordable Housing Development

Being Creative with Massing and Respectful with Scale.



Designing with the Neighborhood in Mind by Integrating Communities and Services.



Situating Housing in Close Proximity to Transportation Services.



Not Making Affordable Housing Look Like Affordable Housing.



Structural Innovation Can Overcome a Difficult Site for the Benefit of Residents.



Main Stakeholders

Public

NYC Department of Parks & Recreation

NYC Department of Housing Preservation & Development

NYC Housing Authority

Housing NY

Private

NYC Housing Development Corporation

Monadnock Development, LLC

Block’s Plot Owners: Limited Liability Companies

Source of Investment




MetLife

Business Model

MAXIMUM POSSIBLE RENT REVENUE → Maximum Possible Developed Square Foot → DENSIFICATION (Urban Infill)

MAXIMUM POSSIBLE RENT REVENUE → Tax Exemptions from Affordable Housing Inclusion

421-a & 420-c TAX EXEMPTIONS

Tax Exemptions from Affordable Housing Inclusion → Higher Total Revenue from Other Functions (Less Property Taxes)

Higher Total Revenue from Other Functions (Less Property Taxes) →
- Office Space
- Retail Space
- Luxury Hotel
- Market-Rate Housing

Financial Feasibility



Affordability

Market-Rate

Luxury Hotel

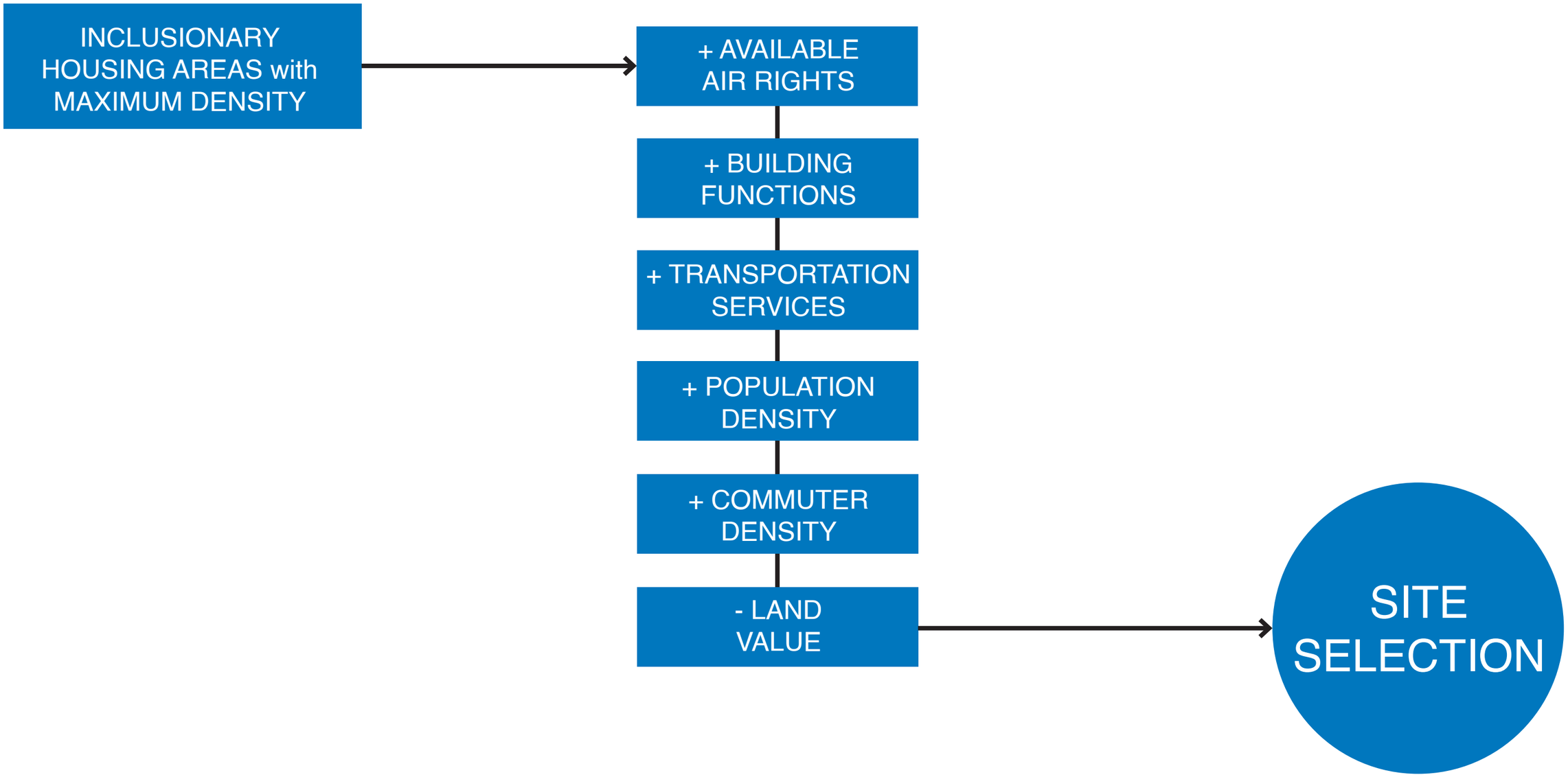
Office Space

Retail

Most Adequate Site for Affordable Housing?

Site Selection Methodology

The Mapping of:





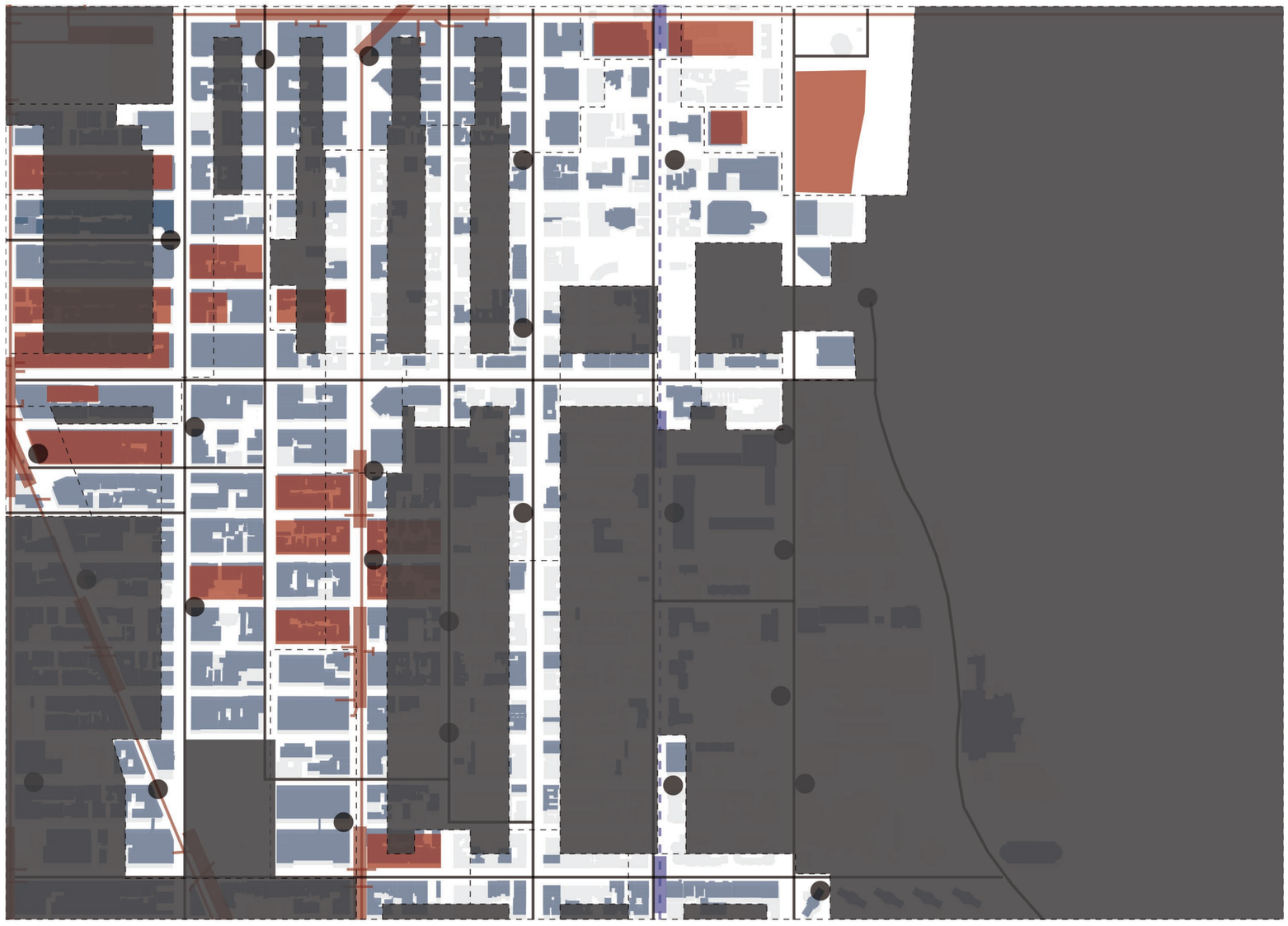
Inclusionary Housing Areas



Most Avalable Air Rights



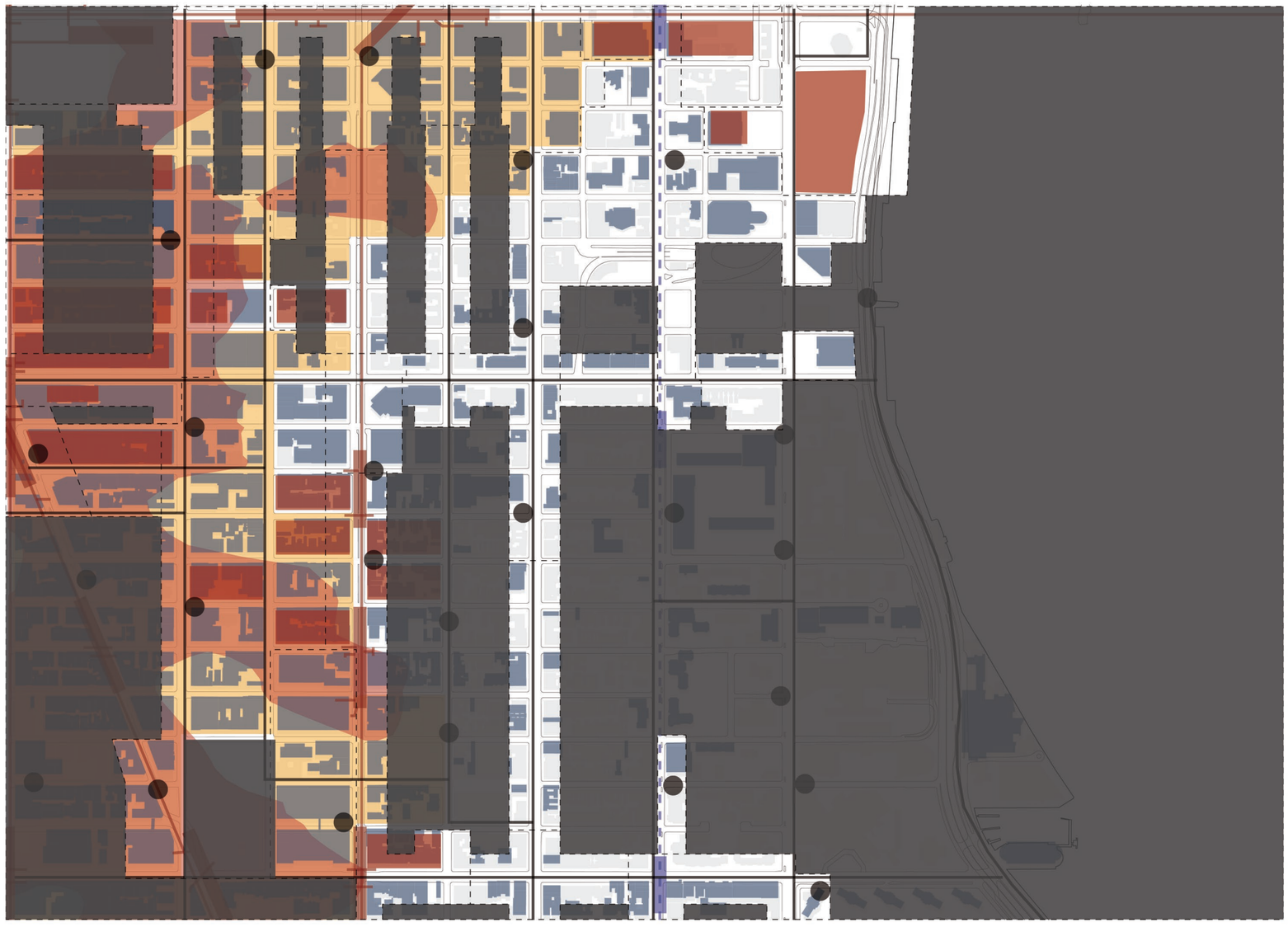
Highest Commercial Activity



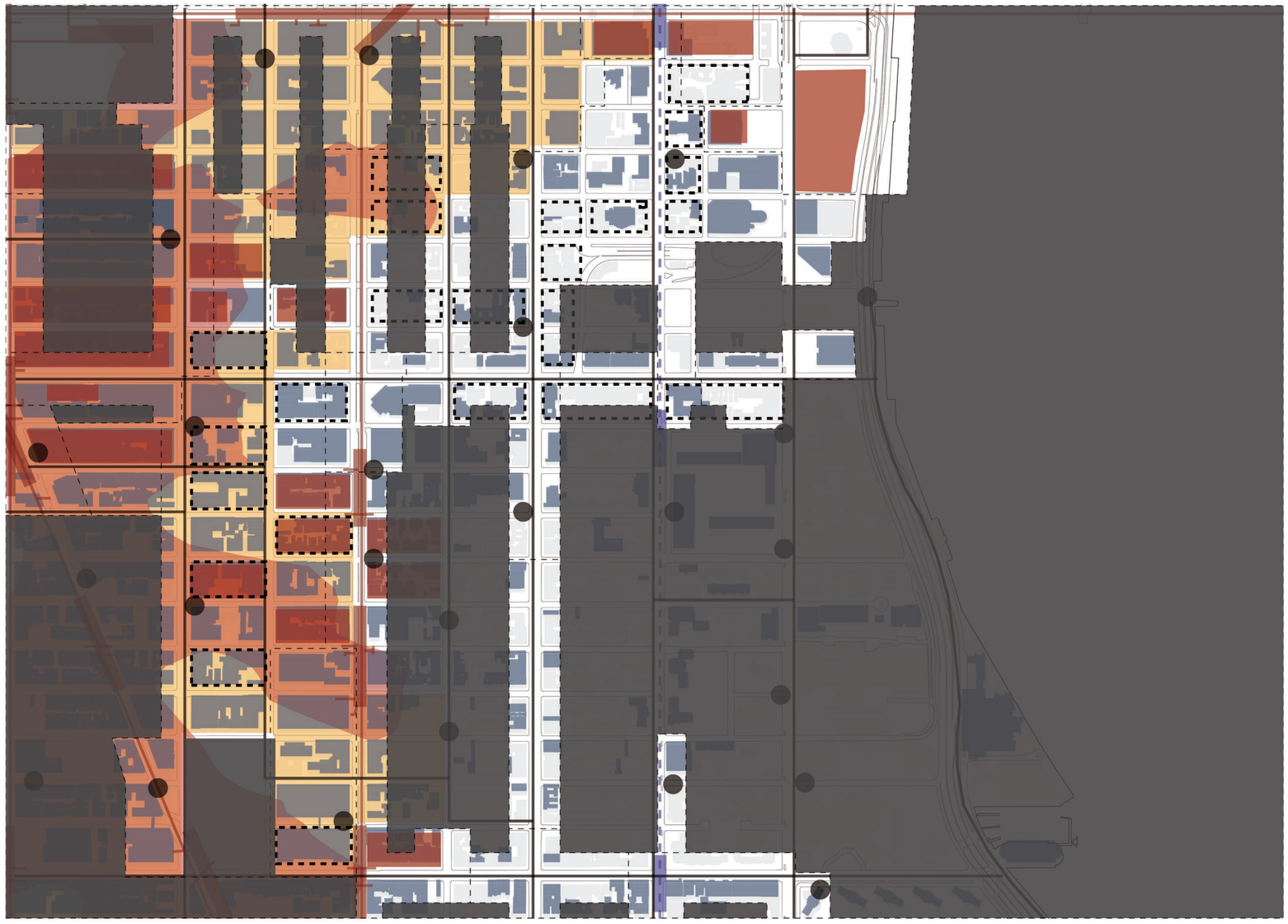
Highest Mobility



Highest Residential Density

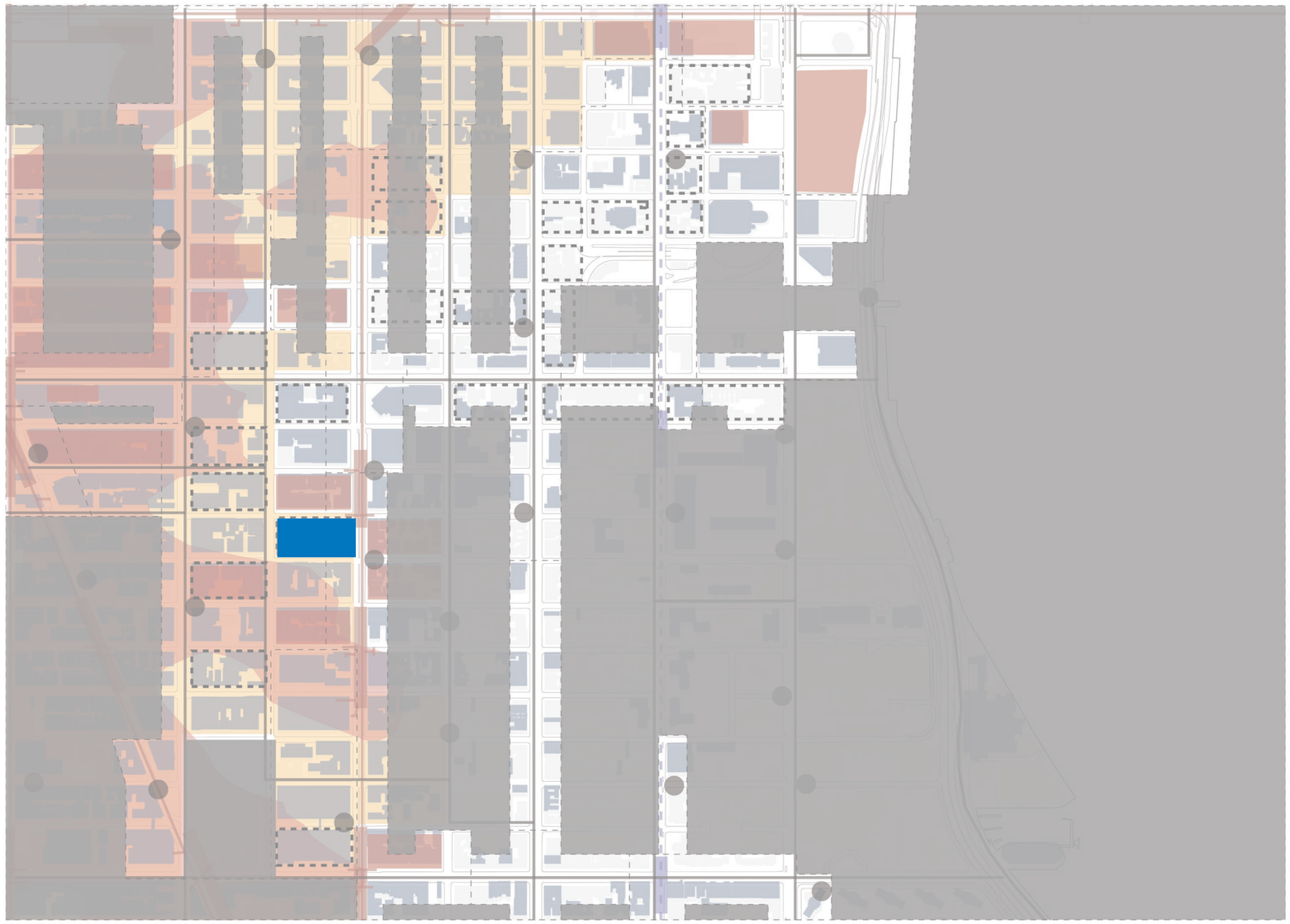


Highest Commuting Density



Blocks with Lowest Real Estate Value

Site Selection



+ Air Rights
+ Commercial Activity
+ Population Density
+ Mobility
+ Commuter Density
- Real Estate Value

33rd STREET

32nd STREET



31st STREET

30th STREET



29th STREET

28th STREET

5th AVENUE

MADISON AVENUE

PARK AVENUE

LEXINGTON AVENUE





0 25m 50m 100m

Madison Av/E 33 St
X63 X64 X68

Madison Av/32 St
0028 BxM11 Q32

4 6 33 St

32 St/Madison Av
M4

Madison Av/E 31 St
BxM3 BxM4

Lexington Av/E 31 St
M101 M102 M103

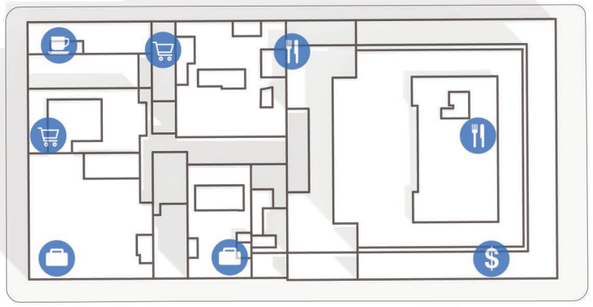
Madison Av/E 30 St
M1 M2 M3

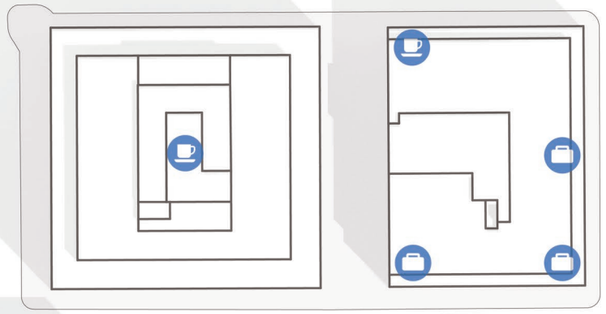
Madison Av/E 28 St
BxM3 BxM4
BxM11 BxM18
M1 M2 M3
X63 X64 X68

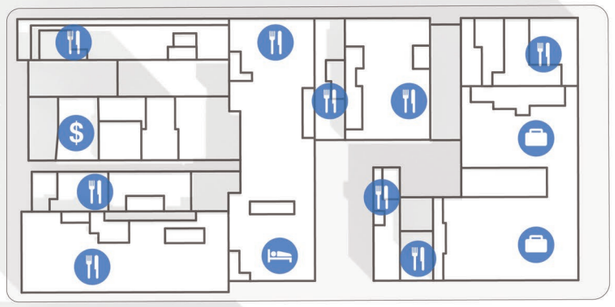
4 6 28 St

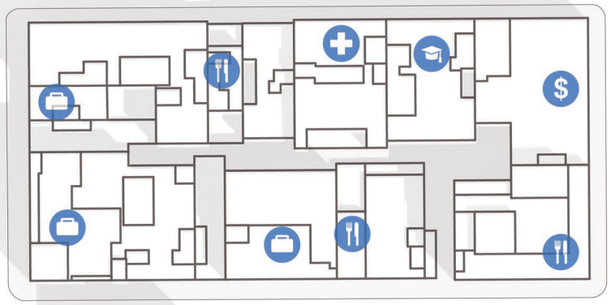
0 25m 50m 100m



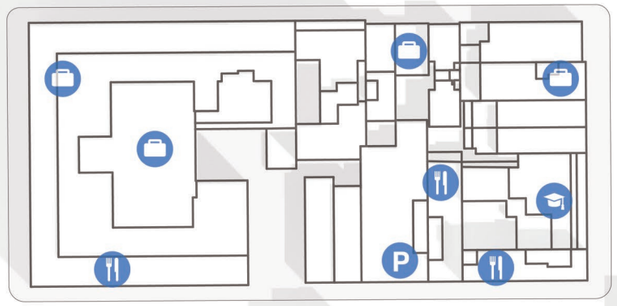


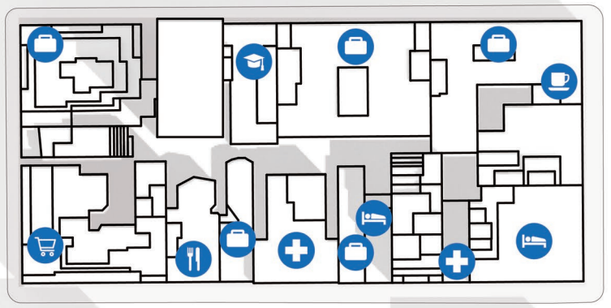


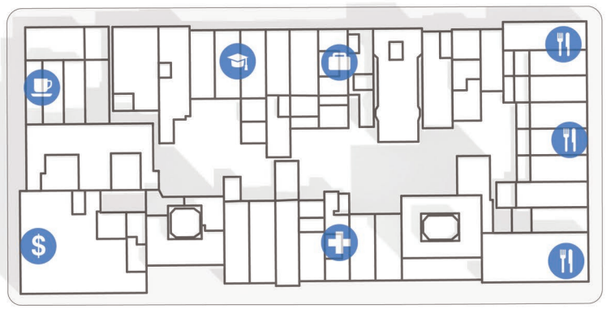


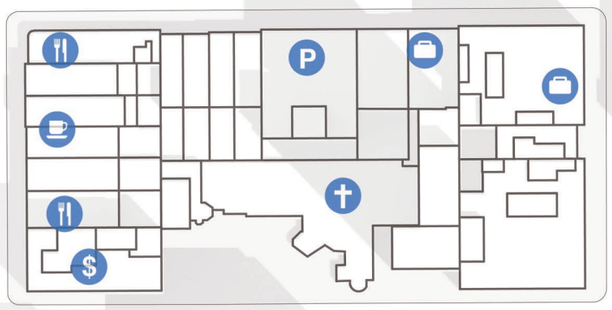


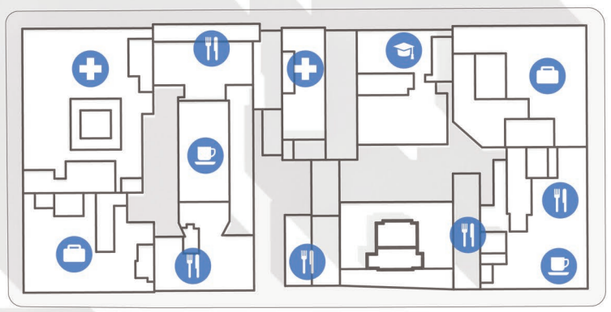




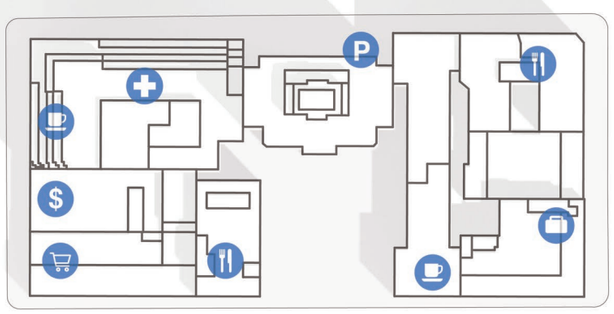


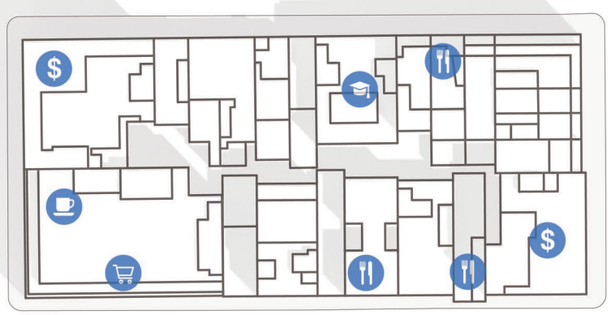


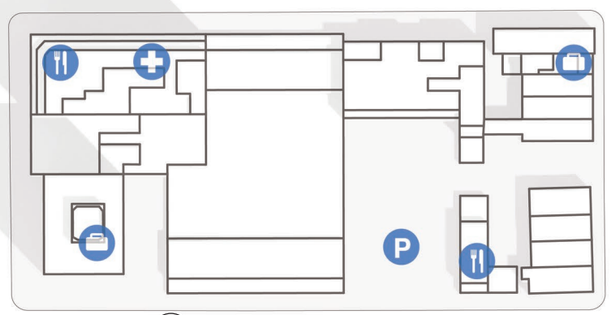


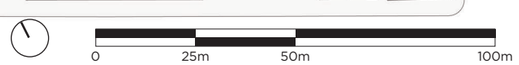











0
25m
50m
100m

130 m

31st STREET

MADISON AVENUE

PARK AVENUE

60 m

Hotel -
Apartment Hotel
1931

Condominiums -
Stores
1920

Elevator
Apartments -
Stores
2017

Offices
1914

Offices -
Commercial
1915

Offices
1912

Elevator Apartments
-
Stores
1938

Elevator Apartments
- Cooperatives
1906

Hotel -
Luxury Type
1920

Elevator
Apartments
- Stores
1925

Walk-up
Apartments
- 1 Store
1925

Walk-up
Apartments
- Offices
1920

Condominiums -
Commercial
1925

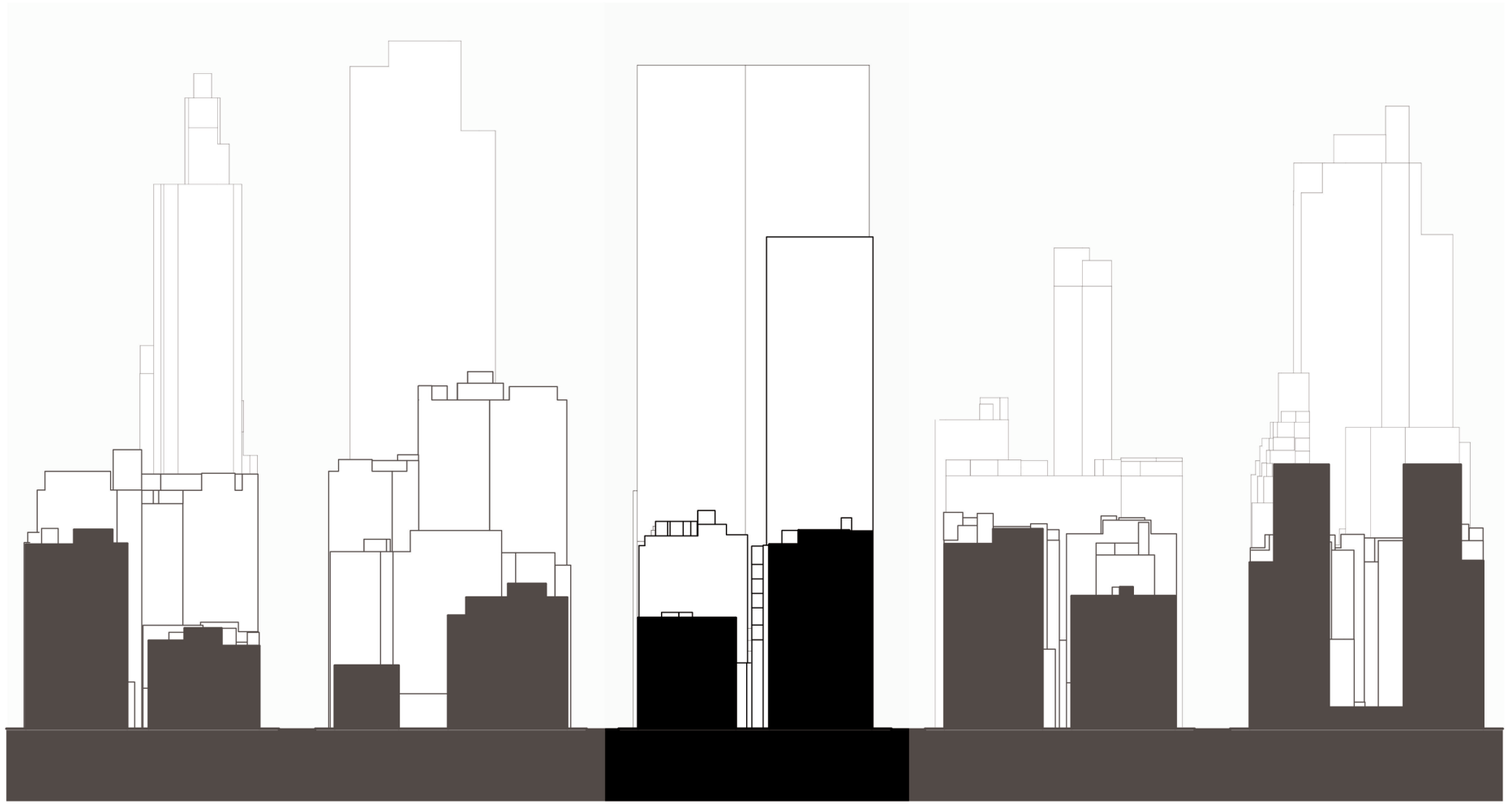
Walk-up Apartments
-
Stores
1925

6-Family Residence
-
1 Store
1915

Mixed Residential & Commercial

Commercial & Office

0 5m 10m 25m 100m



Section Looking West

0 25m 50m 100m



Section Looking North

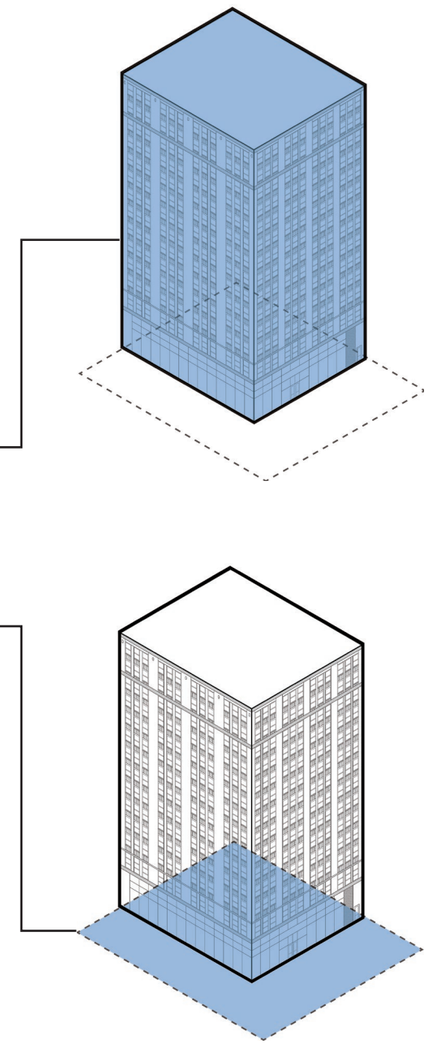
0 25m 50m 100m



Measuring Space

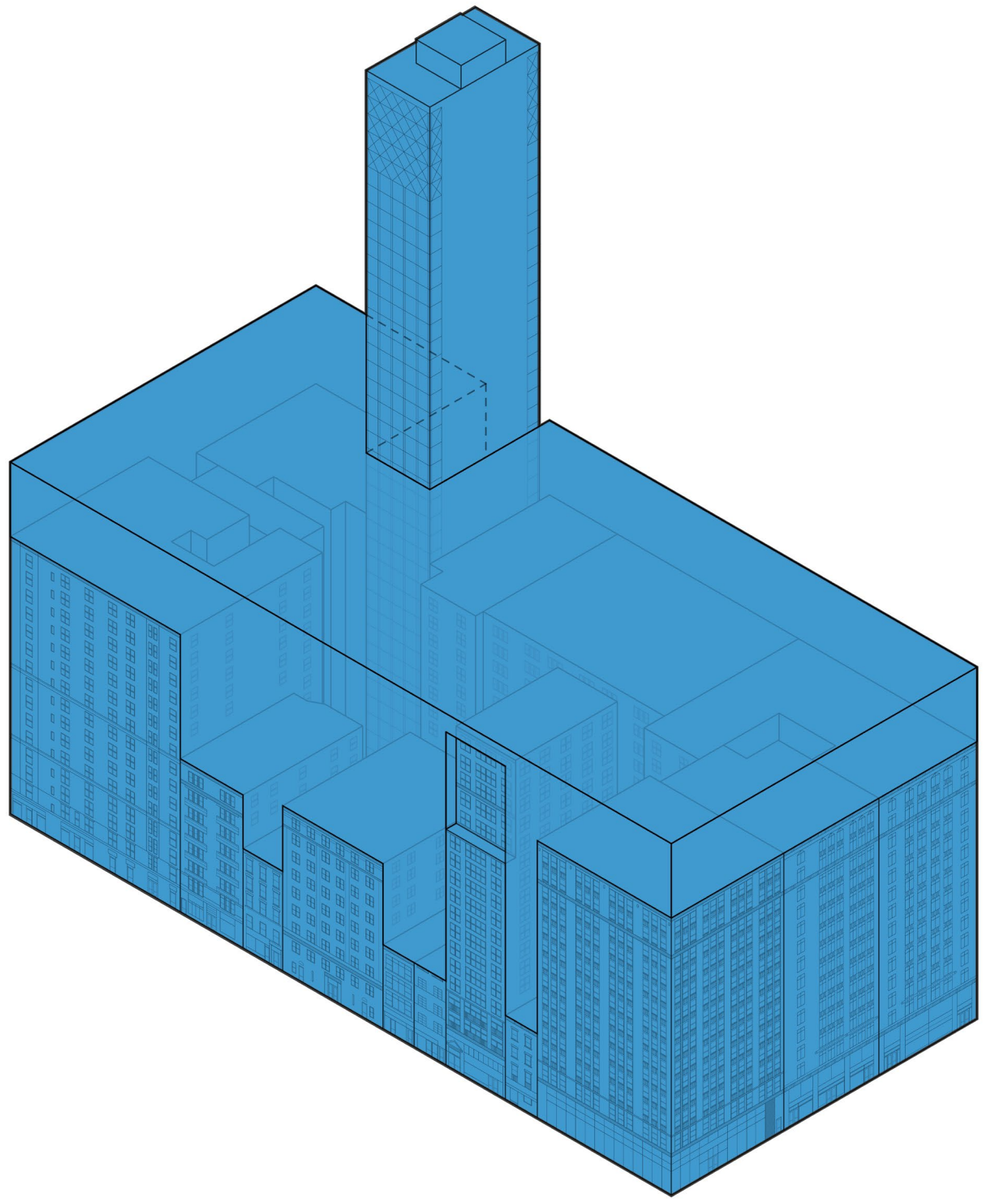
Building sizes and Air Development Rights are measured by the Floor Area Ratio (FAR):

$$\text{FAR} = \frac{\text{Gross Floor Area}}{\text{Area of the Plot}}$$



Zoning Laws impose building limits based on allowed FARs.

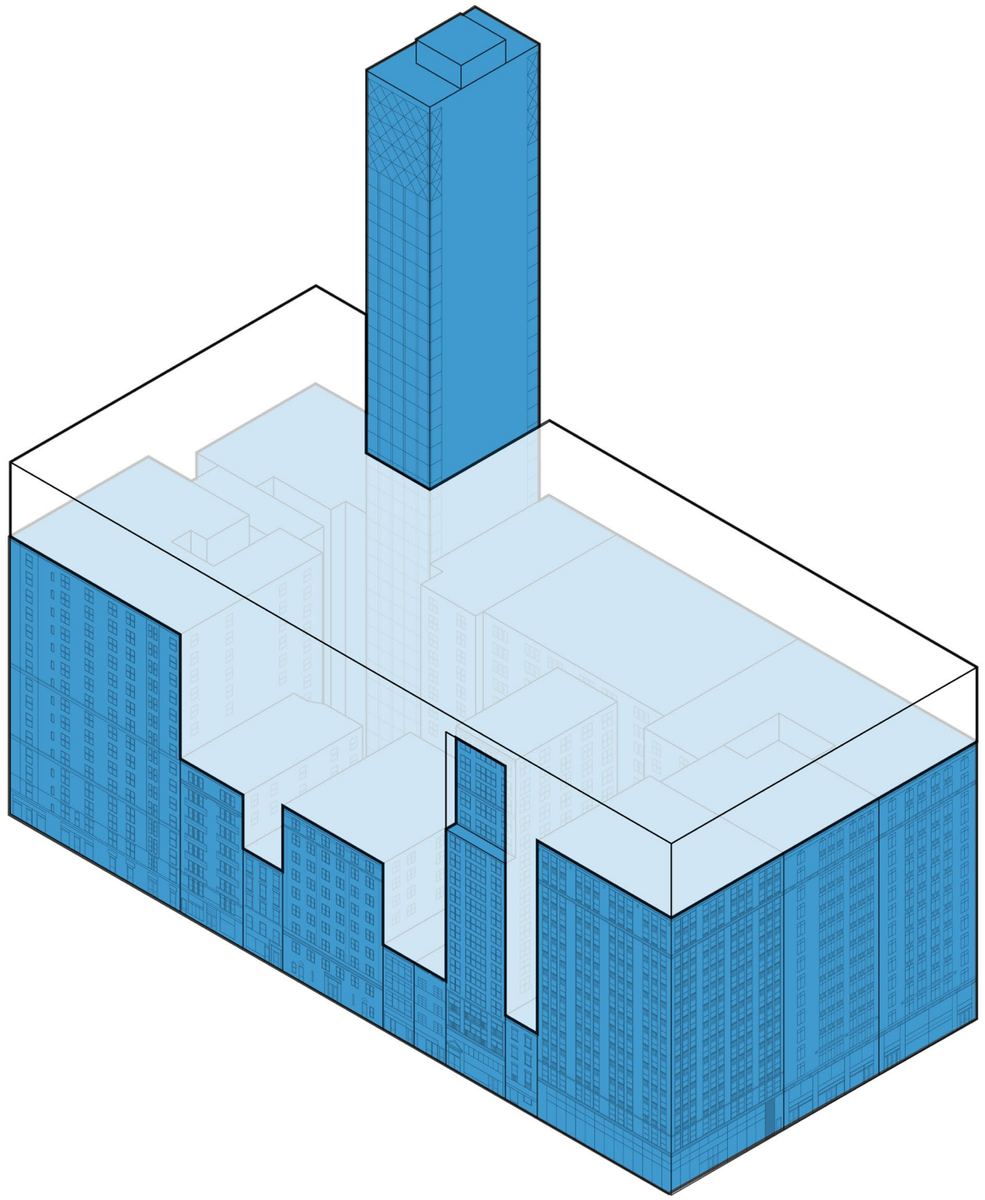
C5-3 Zoning Regulations



Maximum Block Allowed FAR

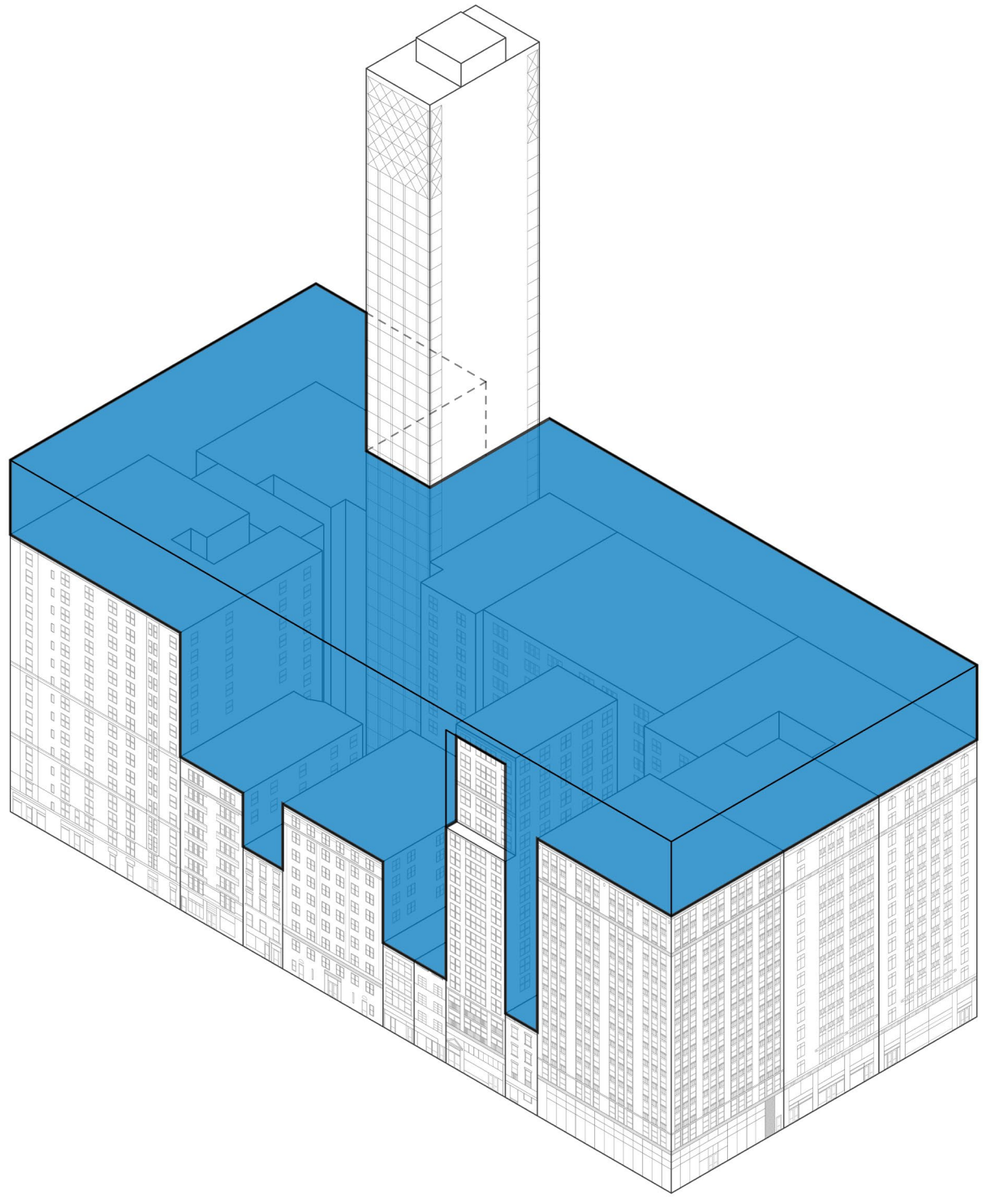
18.0 = 206,100 sqm

15.0 (C5-5) + 3.0 (IH Bonus) = 18.0



- Current Built FAR 12.0 = 137,400 sqm

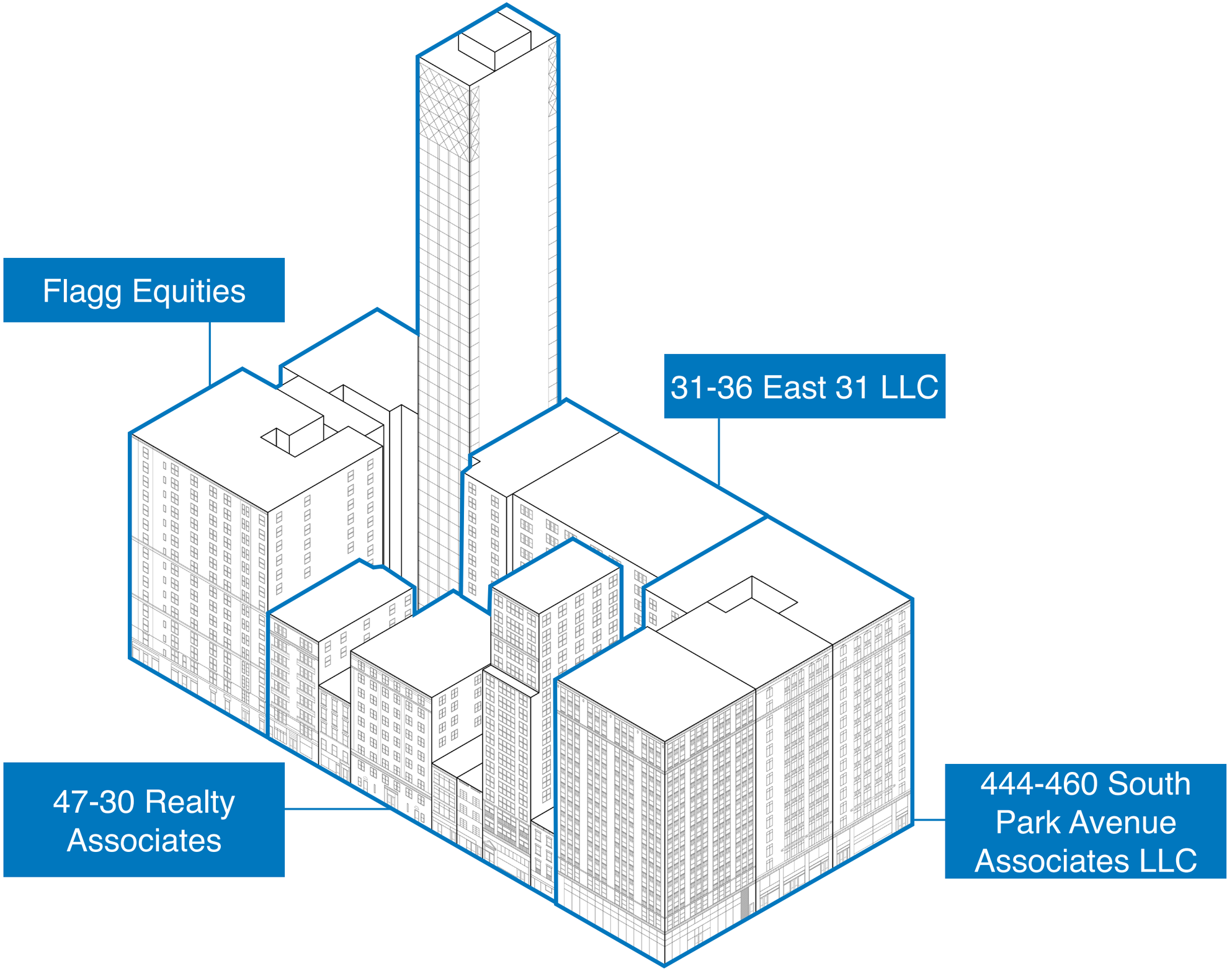
15.0 (C5-5) + 3.0 (IH Bonus) = 18.0



= Available FAR 6.0 = 68,700 sqm

(What can potentially still be built)

Business Opportunity for Plot Owners



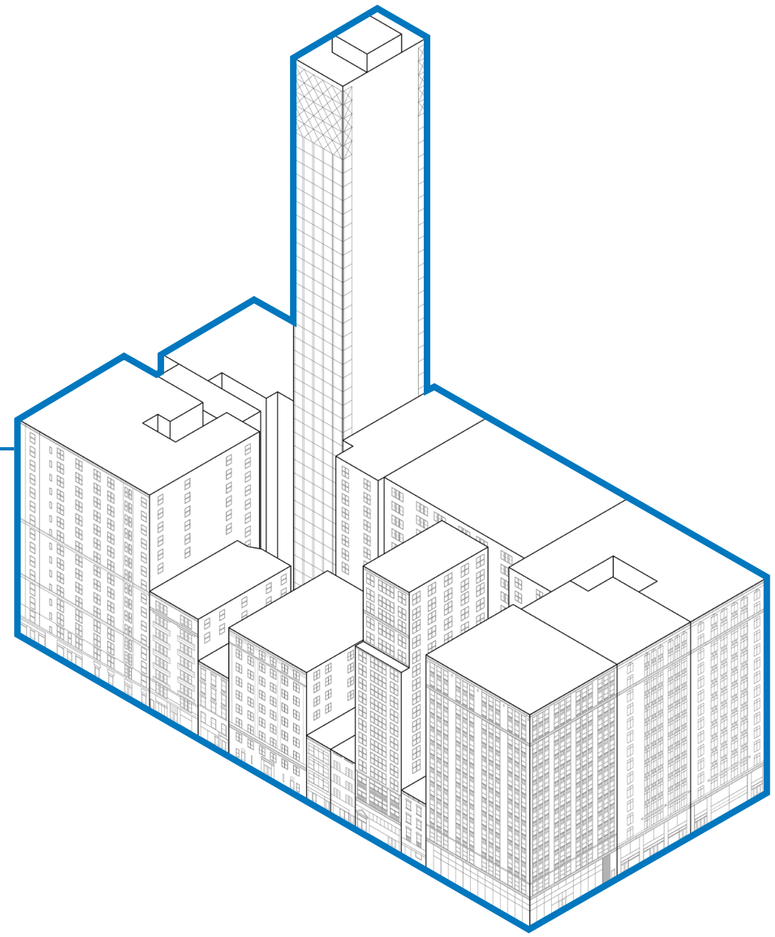
One Cooperative?

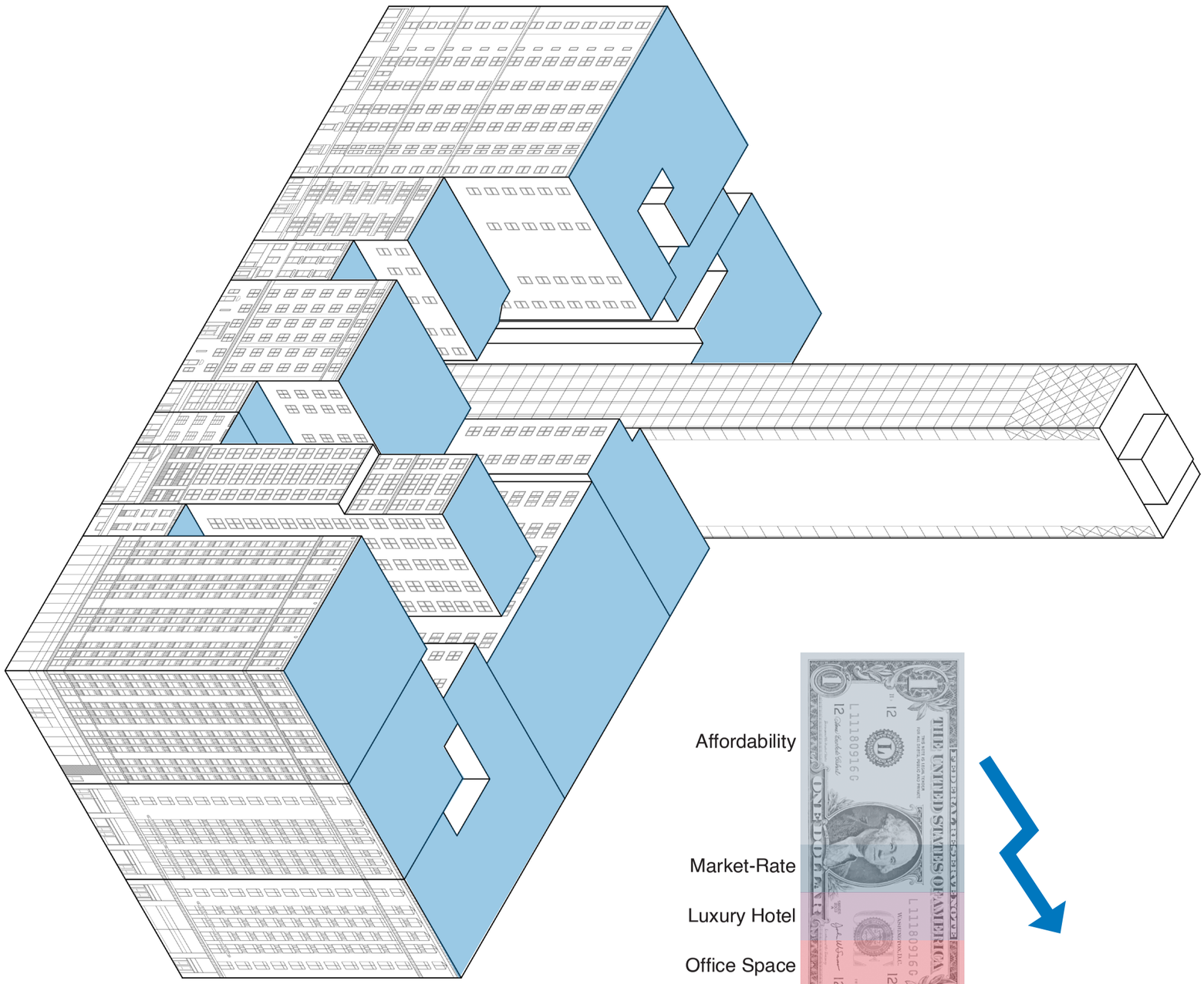
Flagg Equities

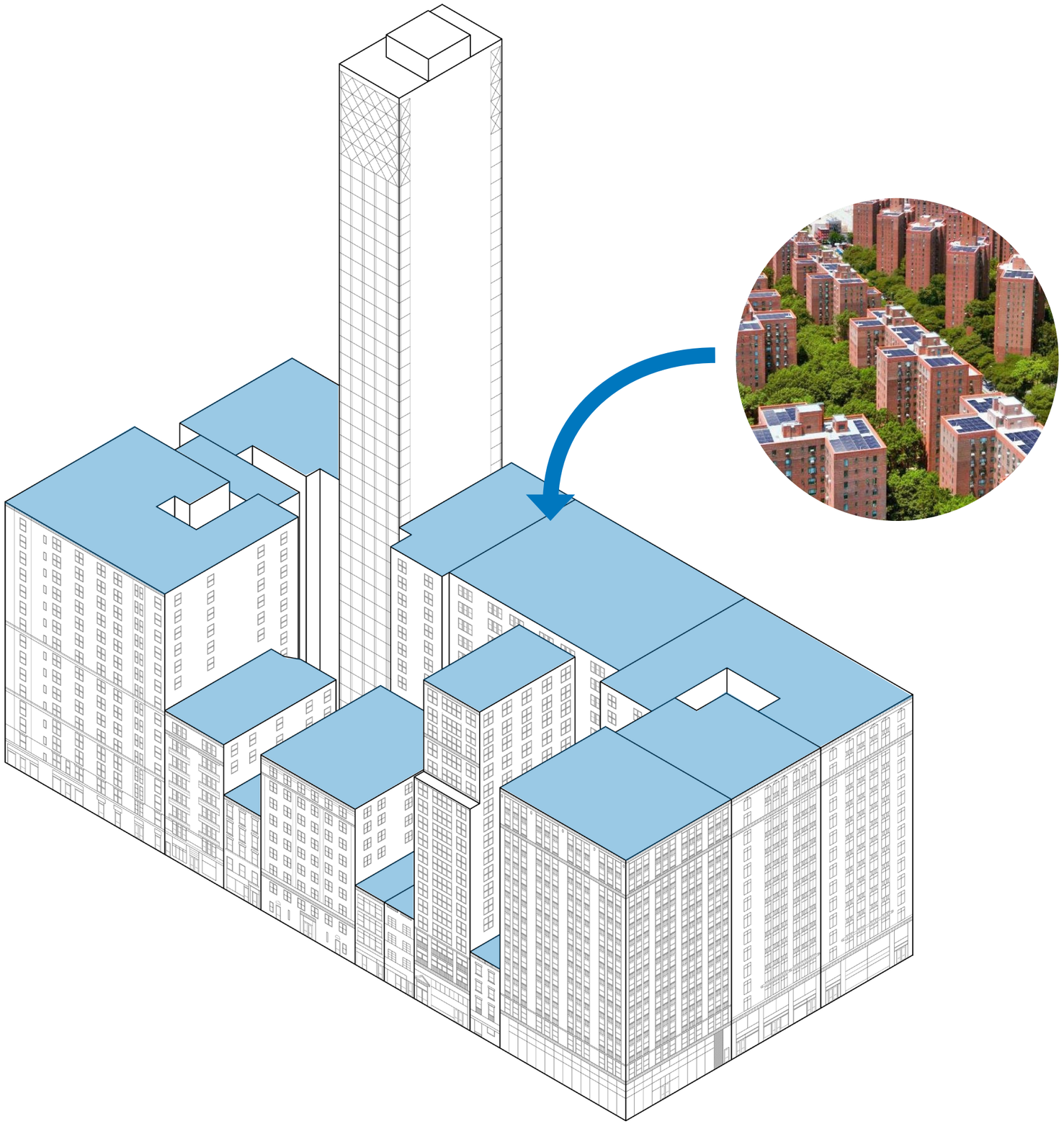
31-36 East 31 LLC

47-30 Realty Associates

444-460 South Park Avenue Associates LLC

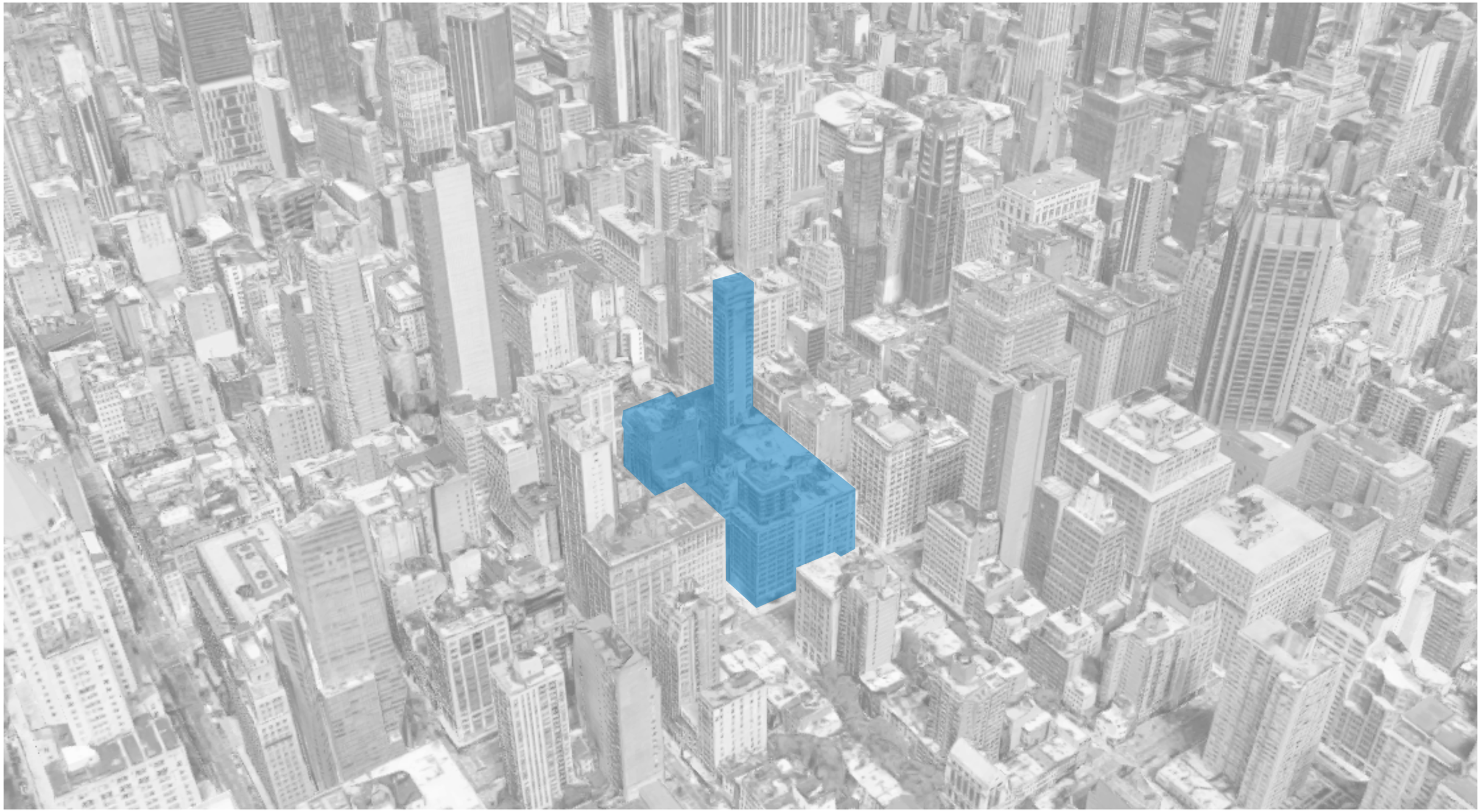


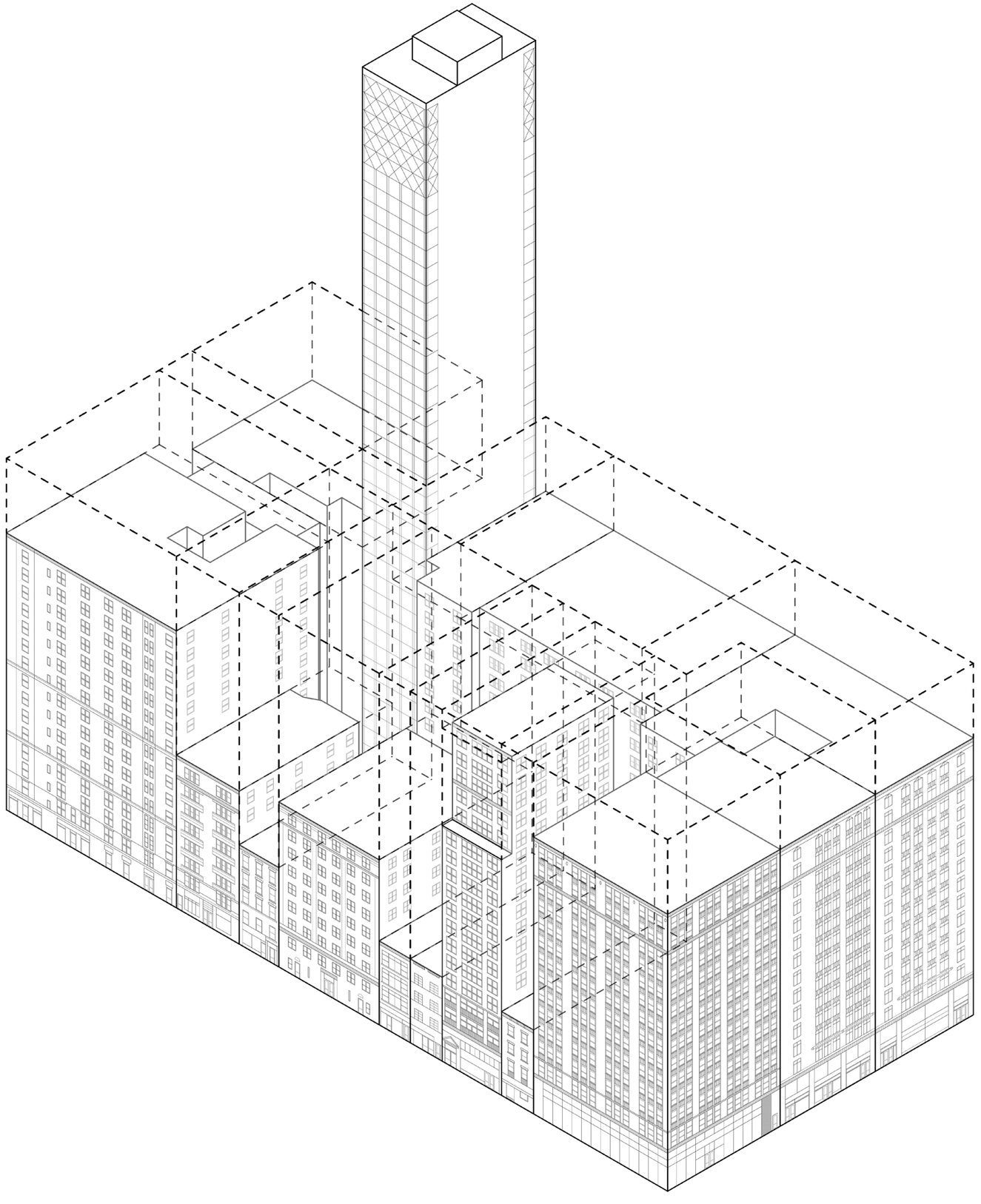

Affordability
Market-Rate
Luxury Hotel
Office Space
Retail



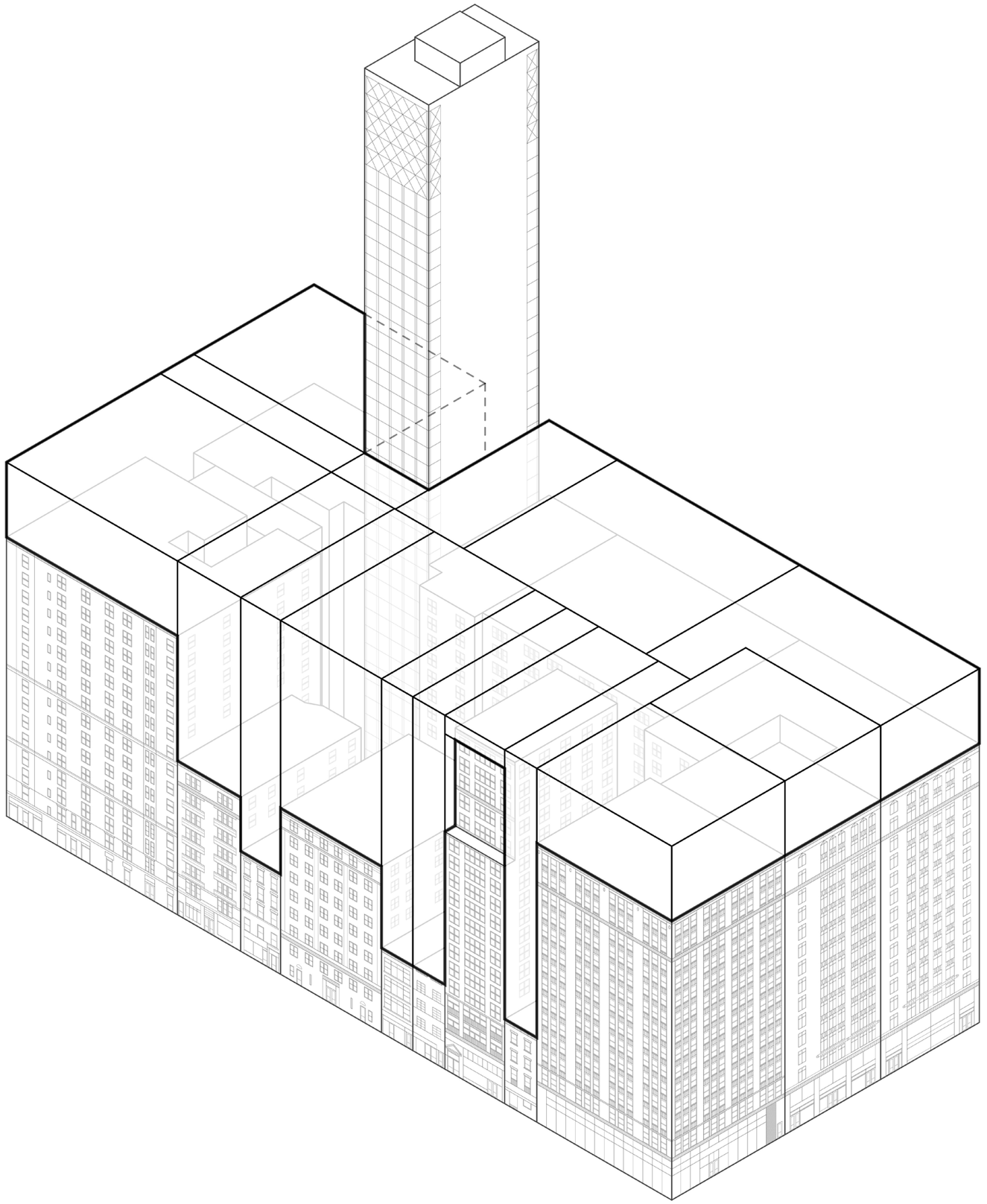
Concept Development.



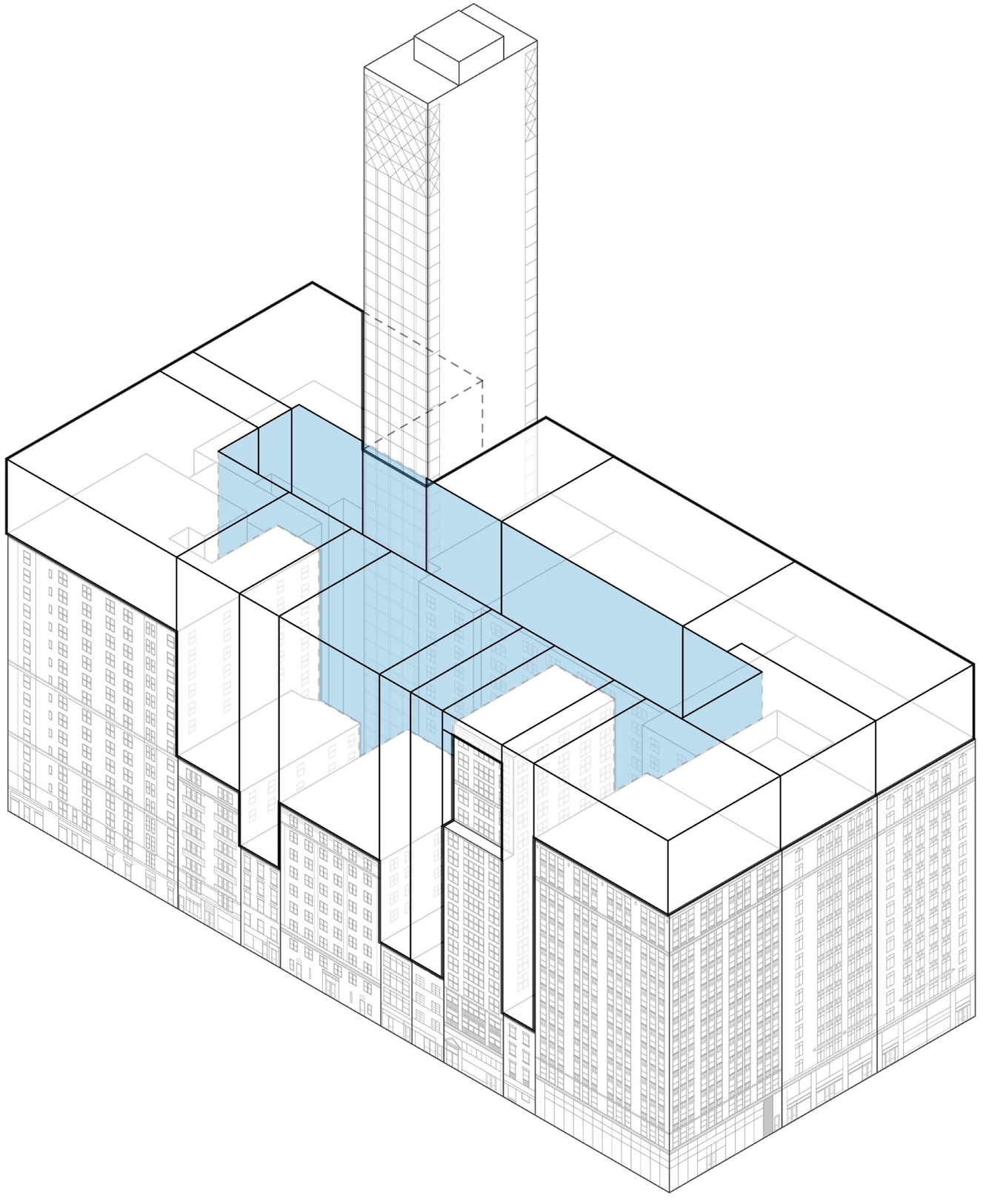




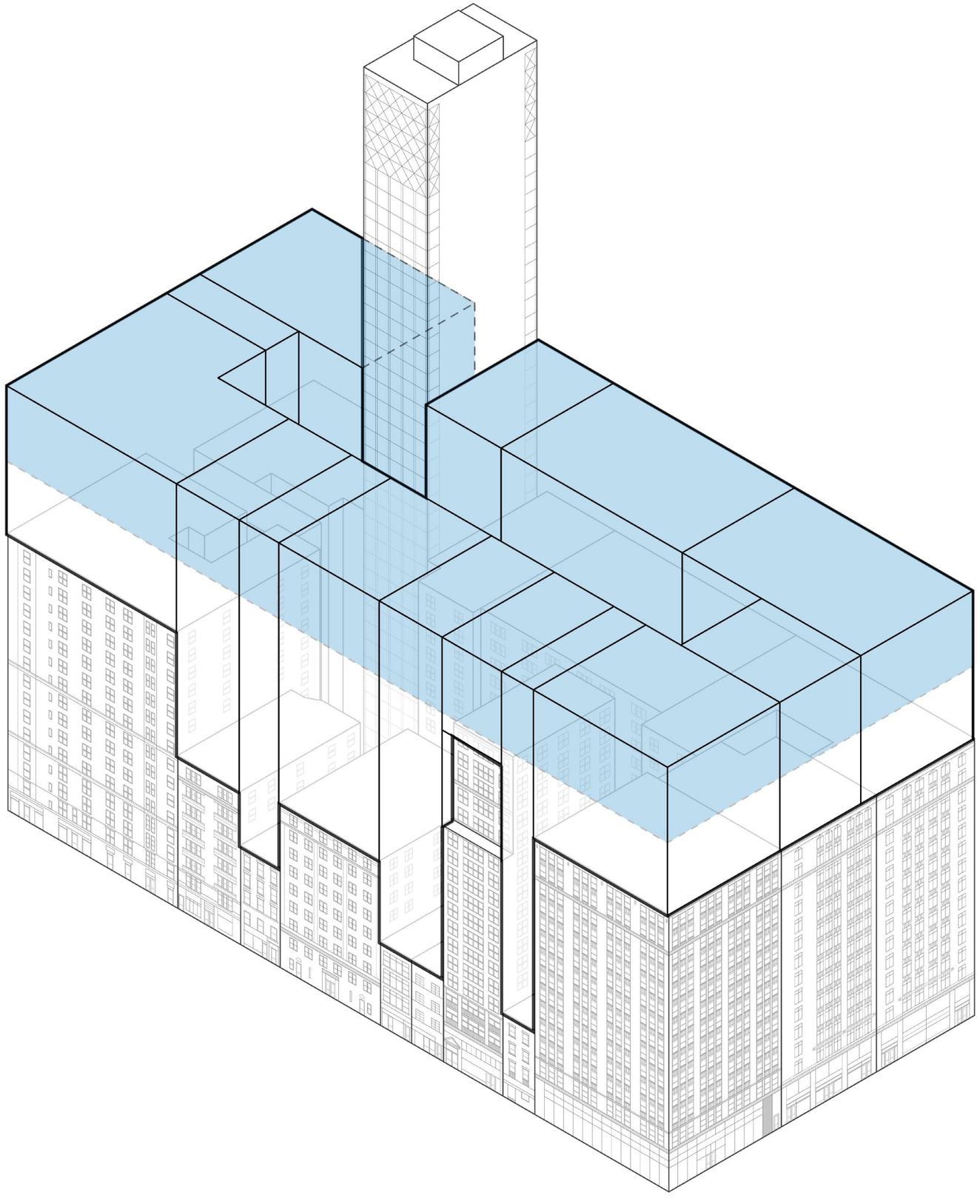
1. Available Air Rights



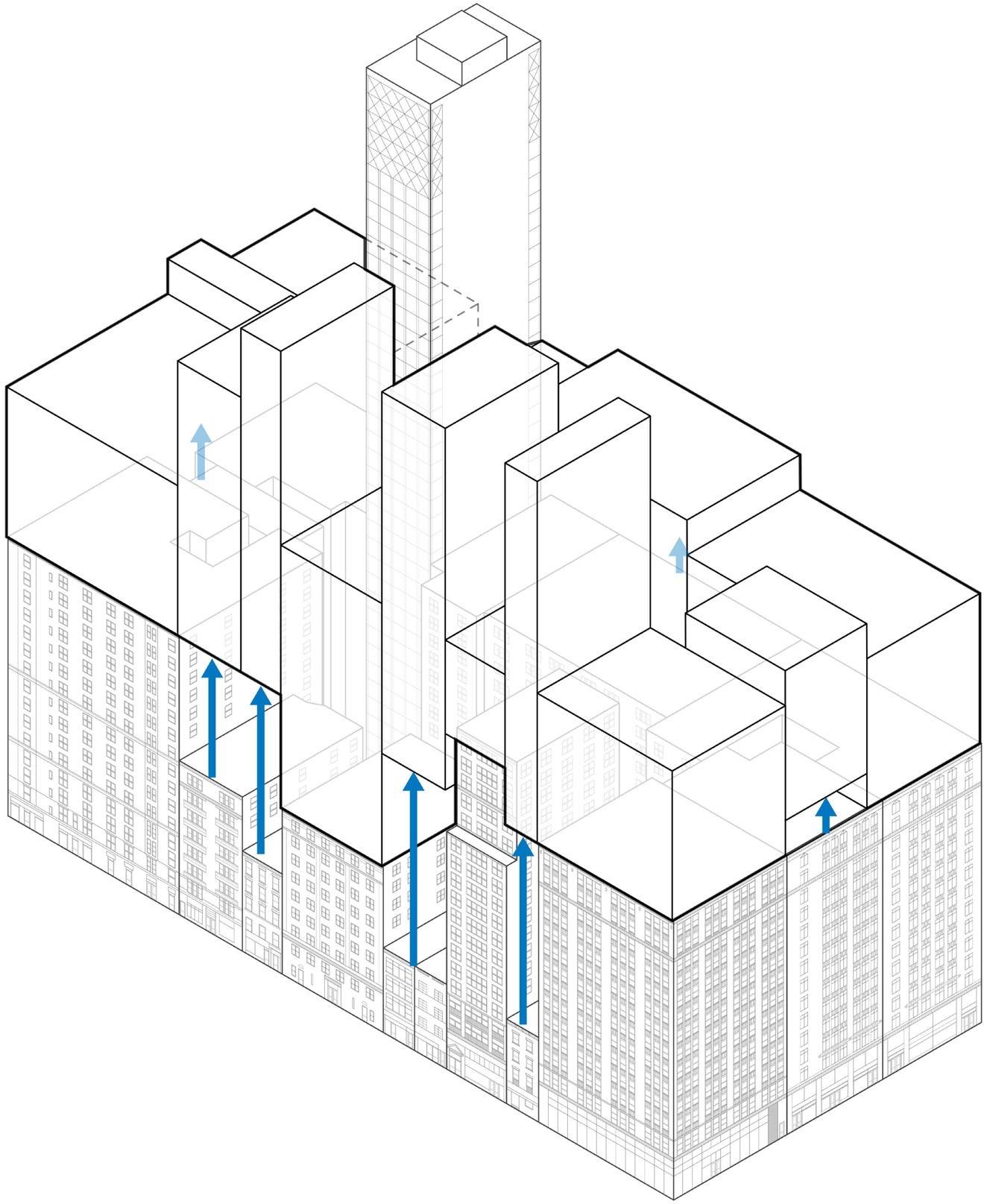
2. Massing



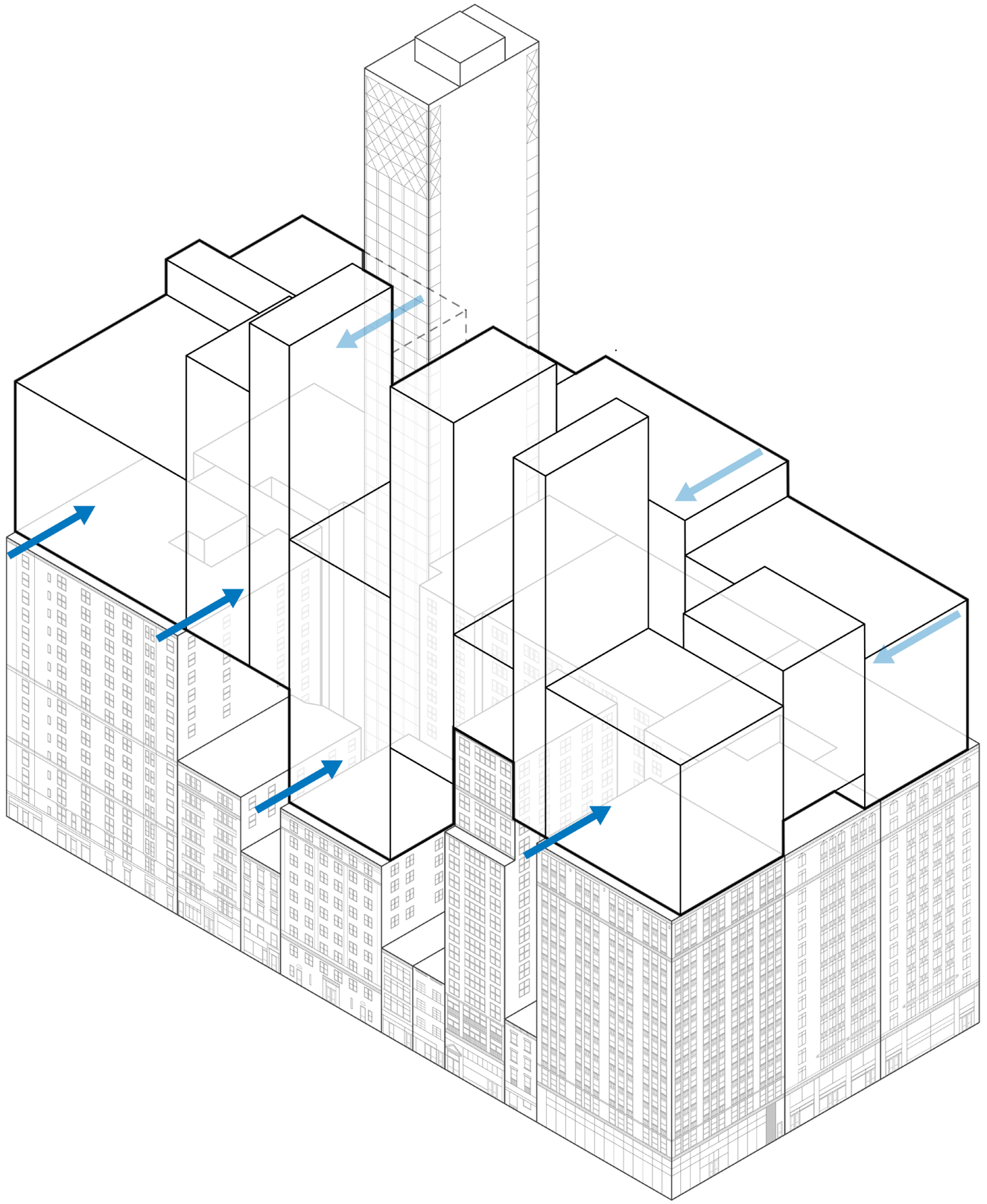
3. Open Up



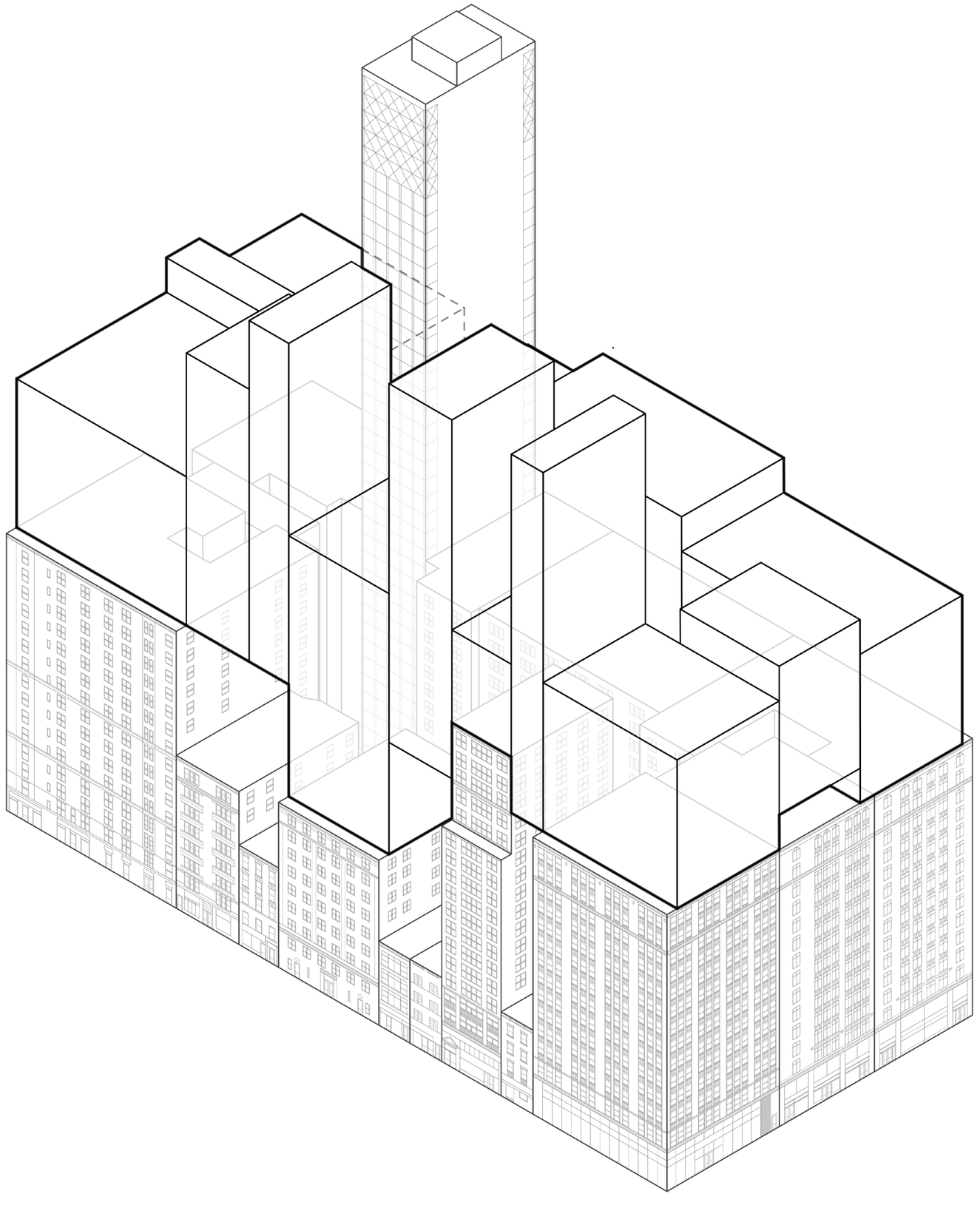
4. Redistribute



5. Elevate

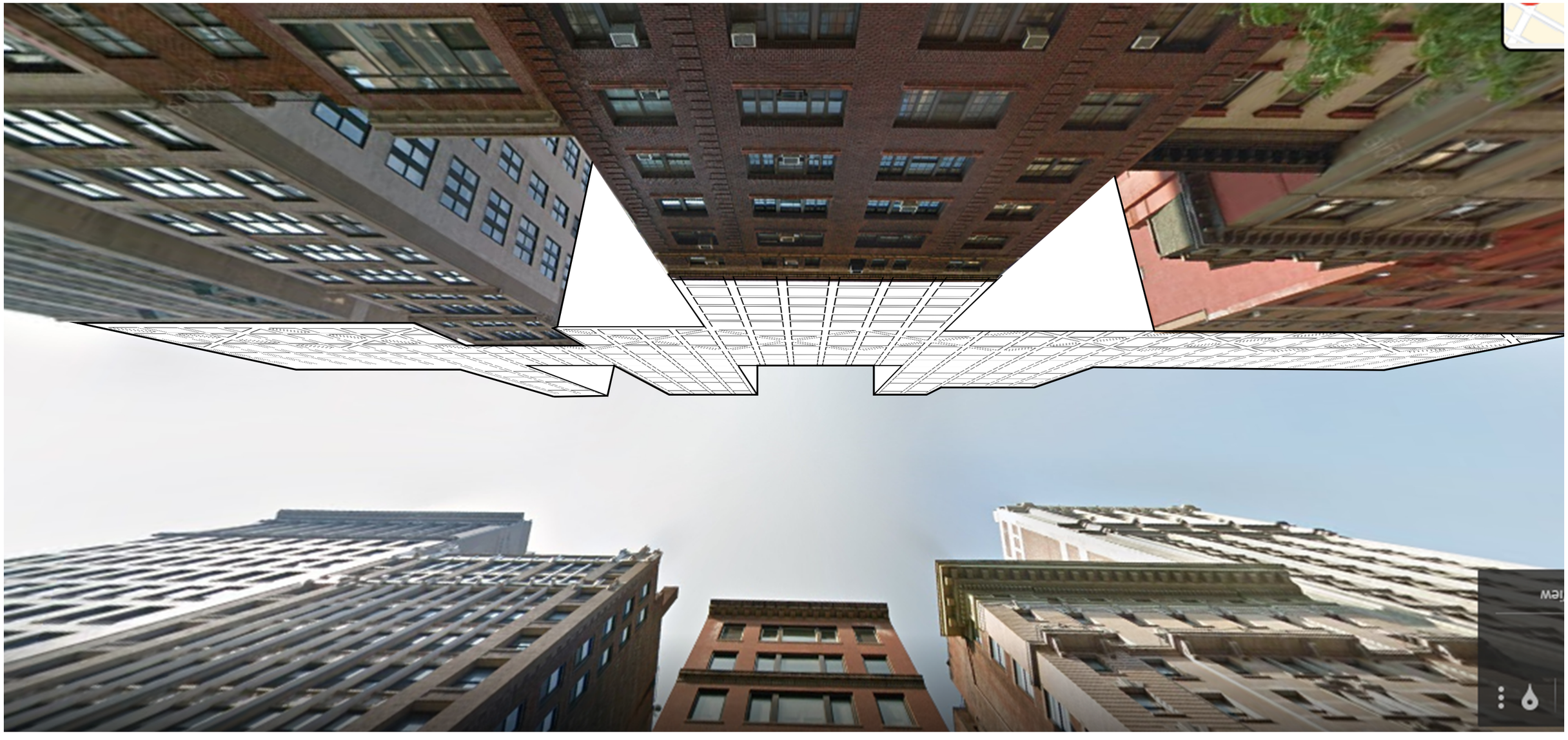


6. Recess



7. Result

Mad Heights





Mad



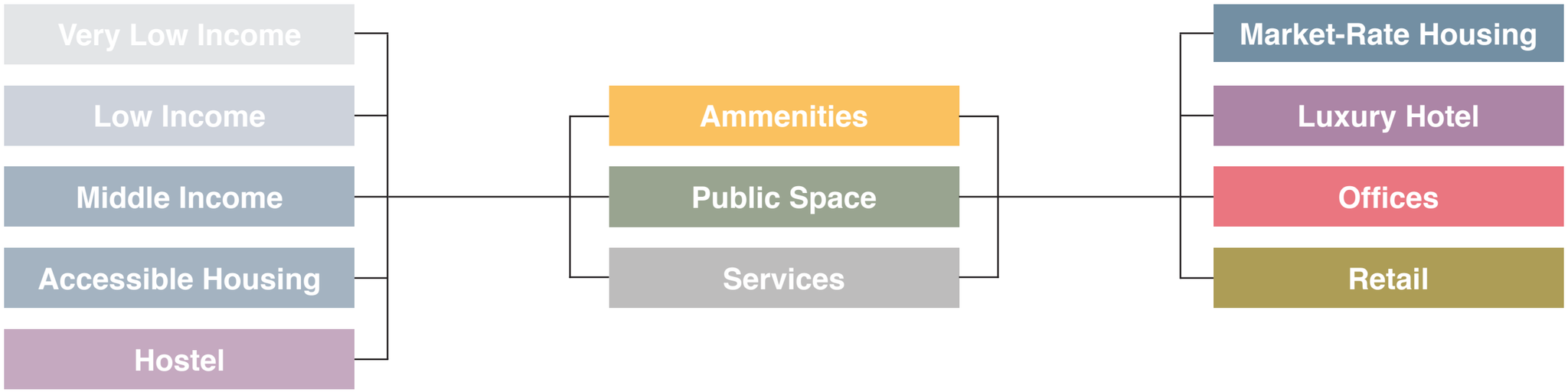
Heights

Program.



Preservation of the Cultural and Social Fabric of Urban Life

Program Requirements

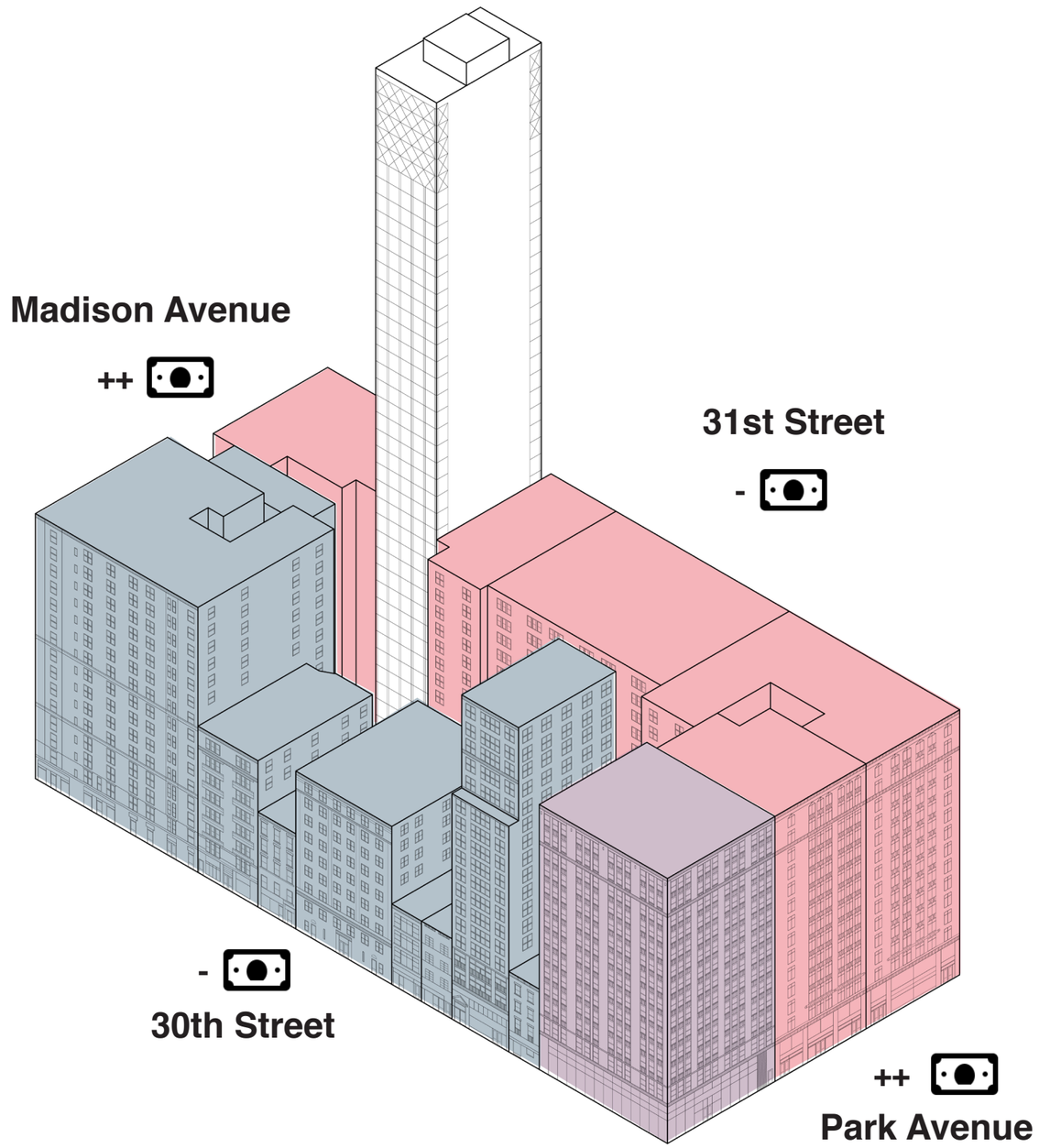


Affordability

Shared Functions

Business Model

Real Estate Value



Residential:

Market-rate housing

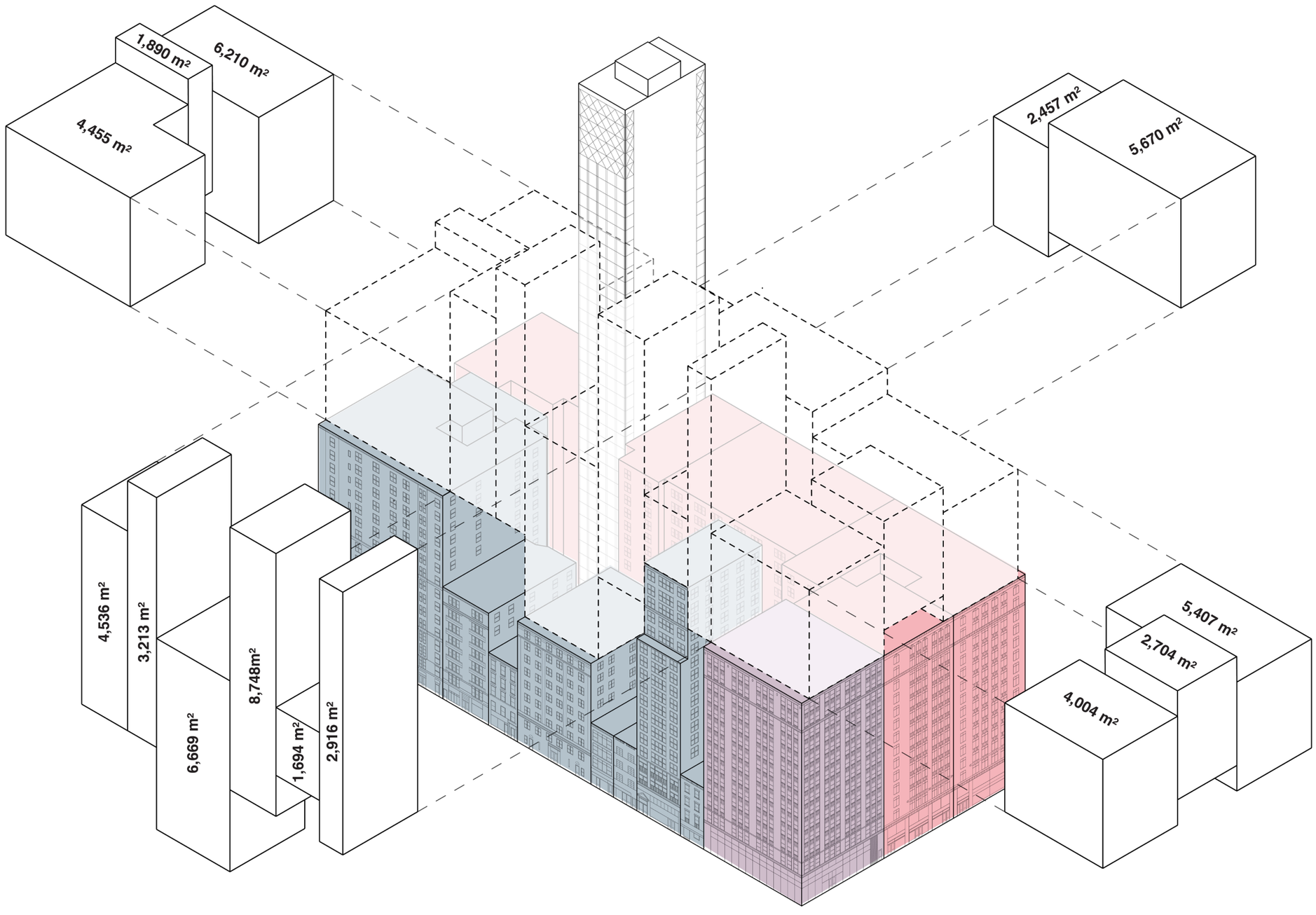
Lodging:

Hotel

Commercial:

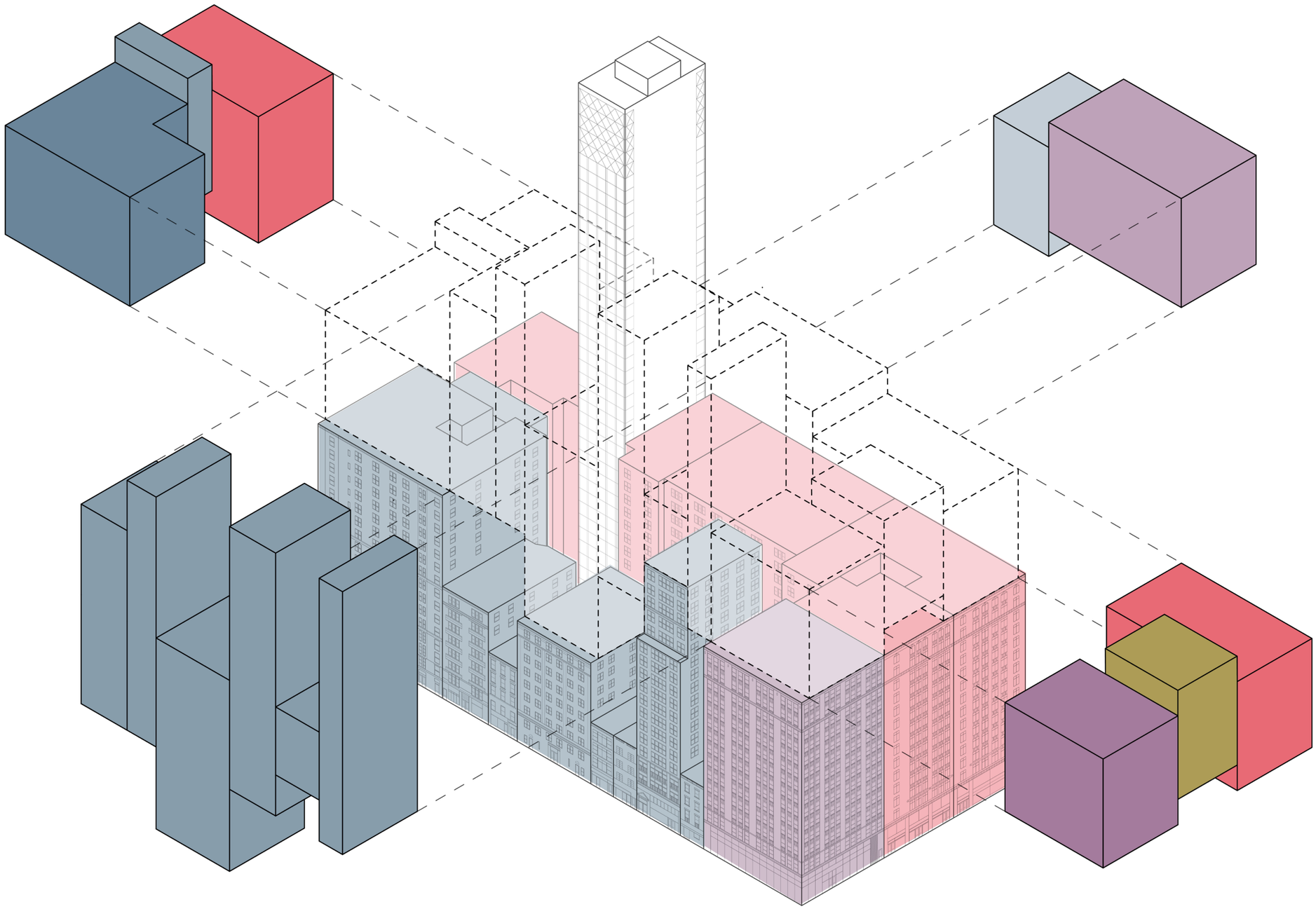
Offices

Available Floor Area



Total Floor Area: 68,700 Square Meters

Program Distribution



Residential:

- Market-rate housing
- Affordable housing
- Accessible units

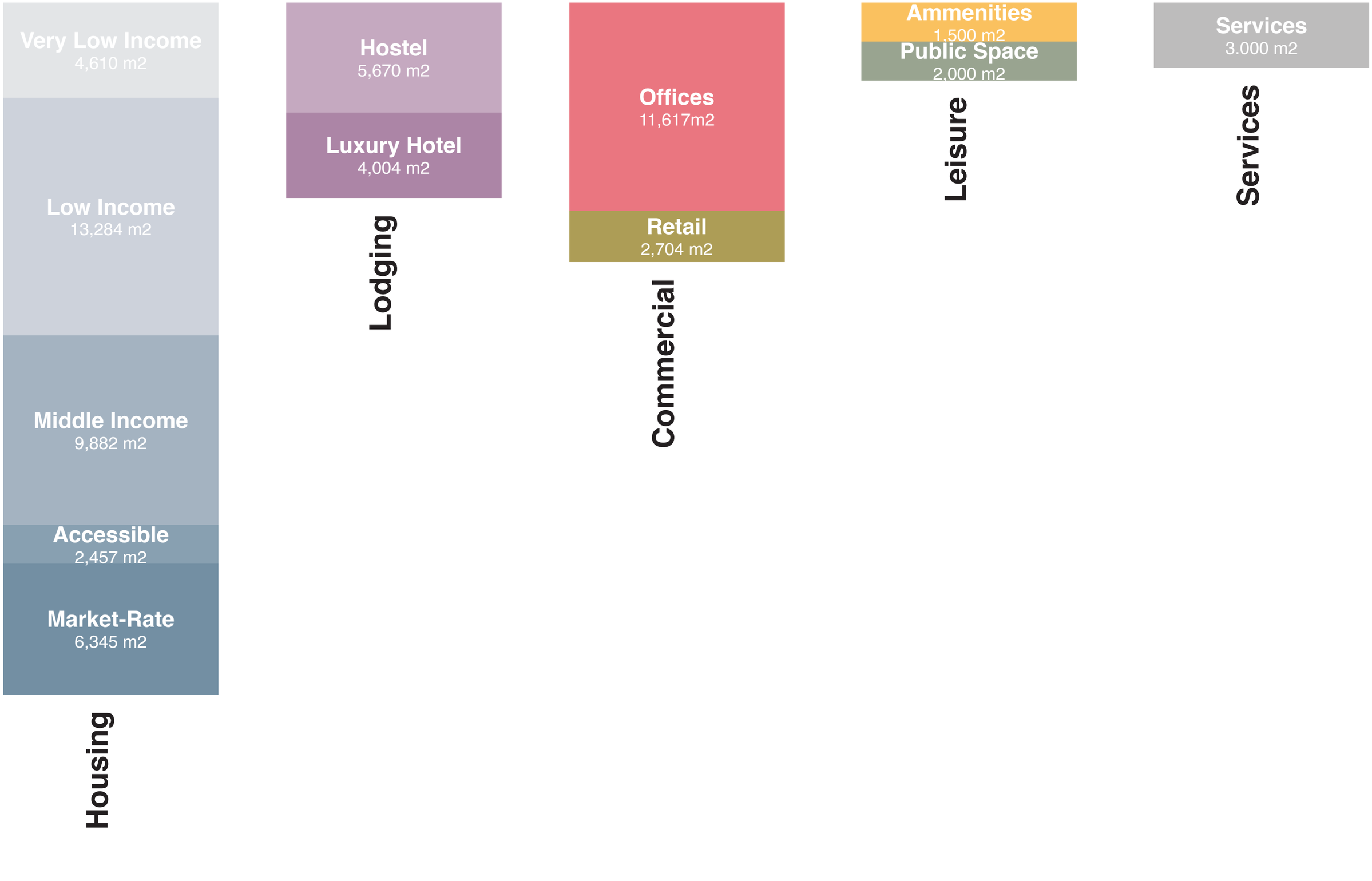
Lodging:

- Hostel
- Apart-Hotel

Commercial:

- Offices
- Retail

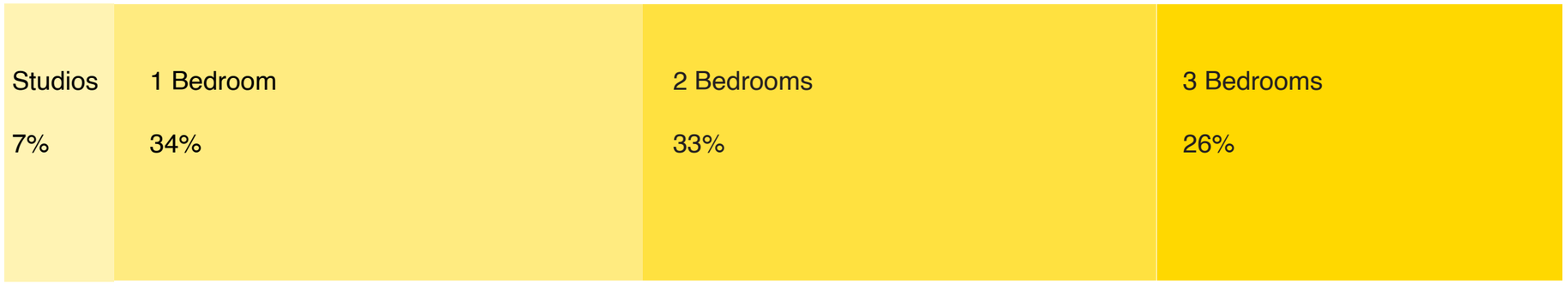
Program Distribution



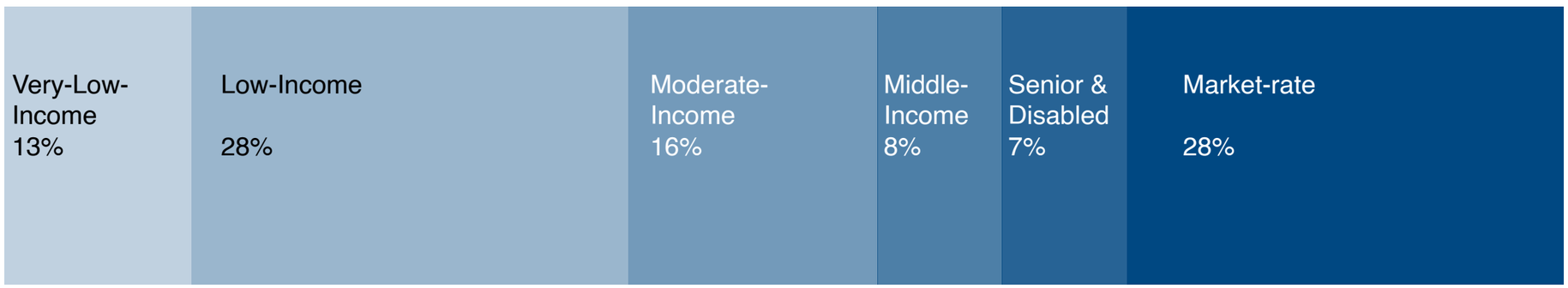
Unit Nature and Size

Per Household Type

Unit Type



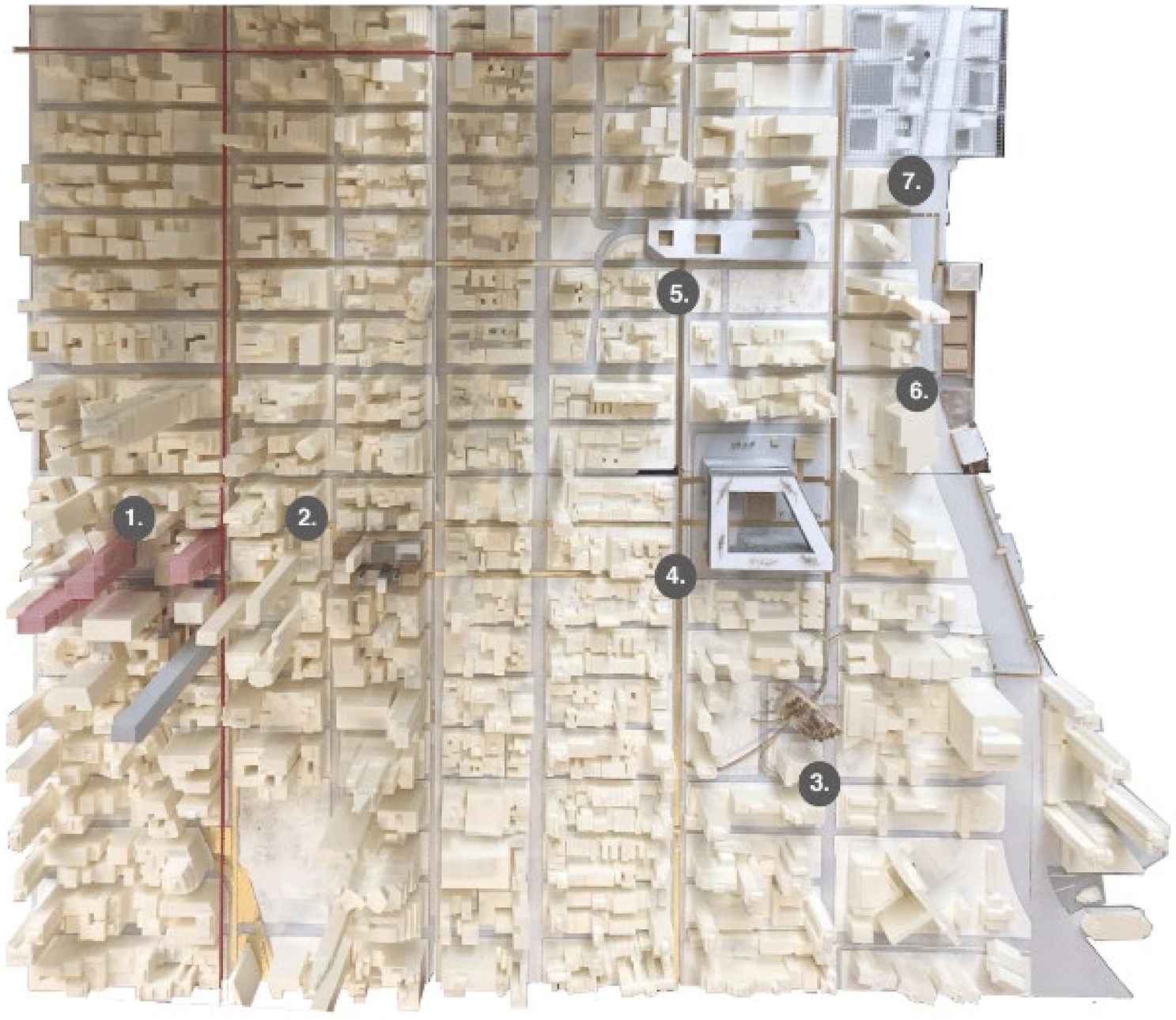
Income Level



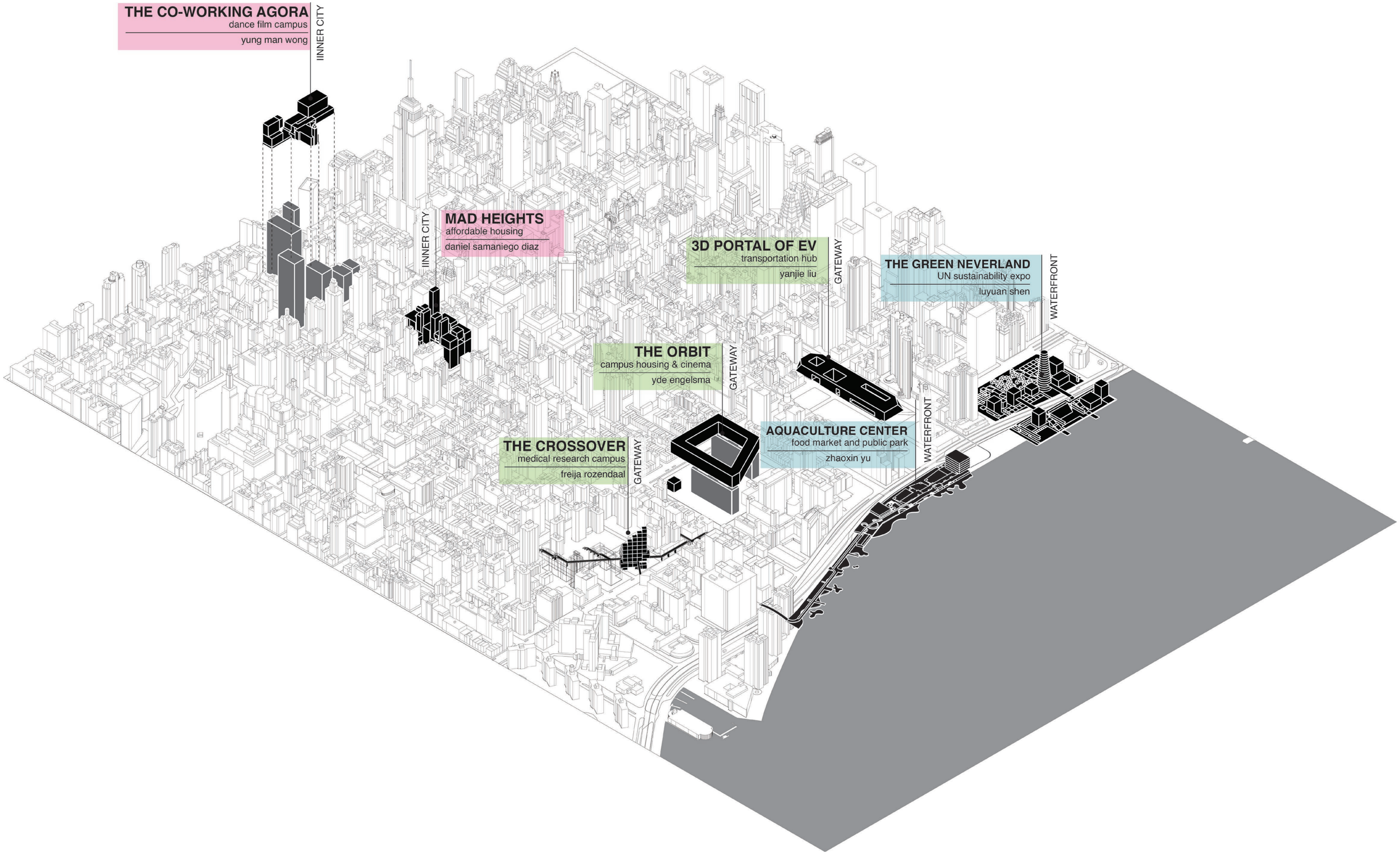
376 Total Units, 271 Affordable

Approx. 470 Residents in Affordable Units,

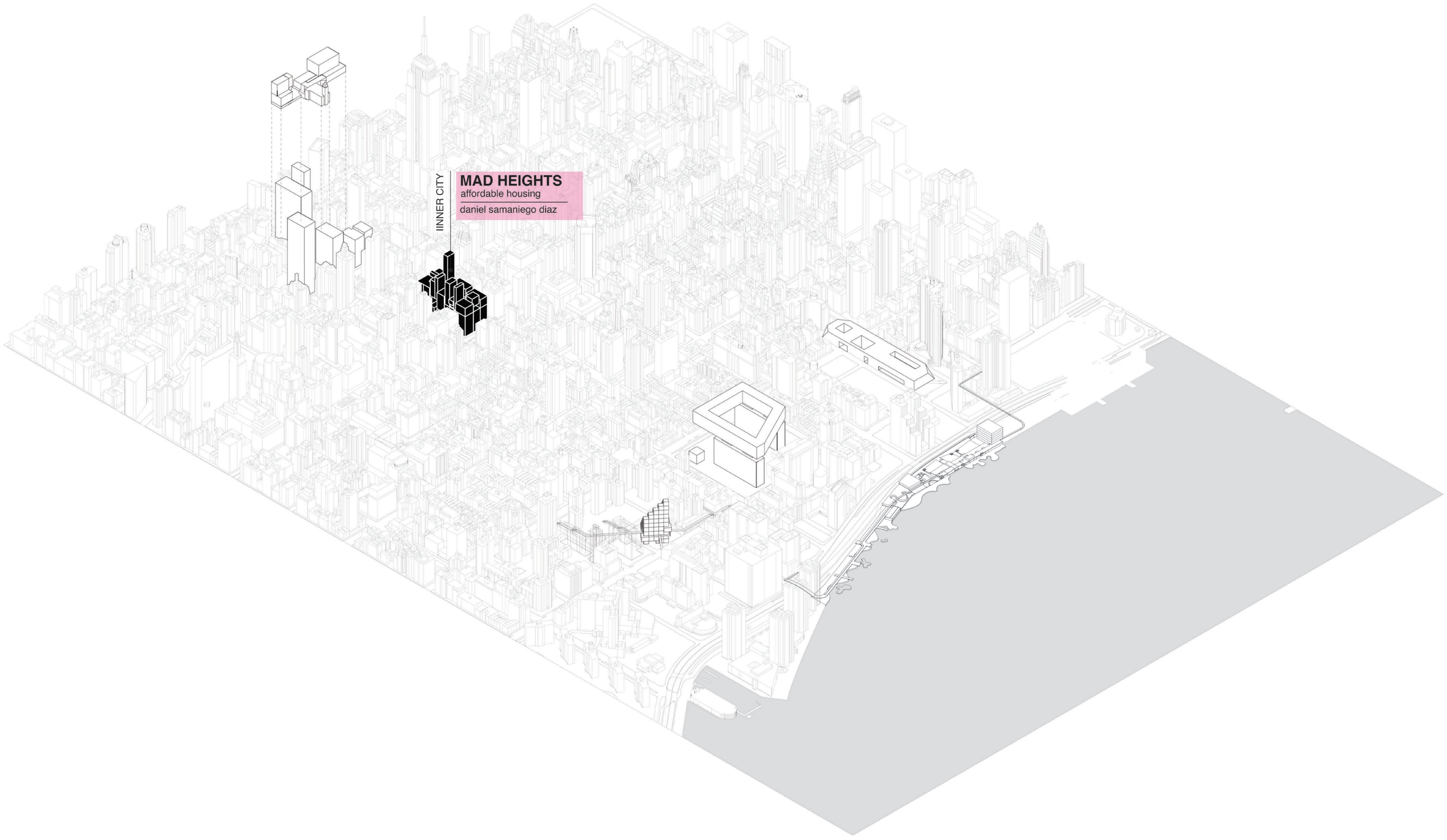
Design.



Mad Heights (2.) in Empire Village Model Plan



Empire Village Group Strategy per Project



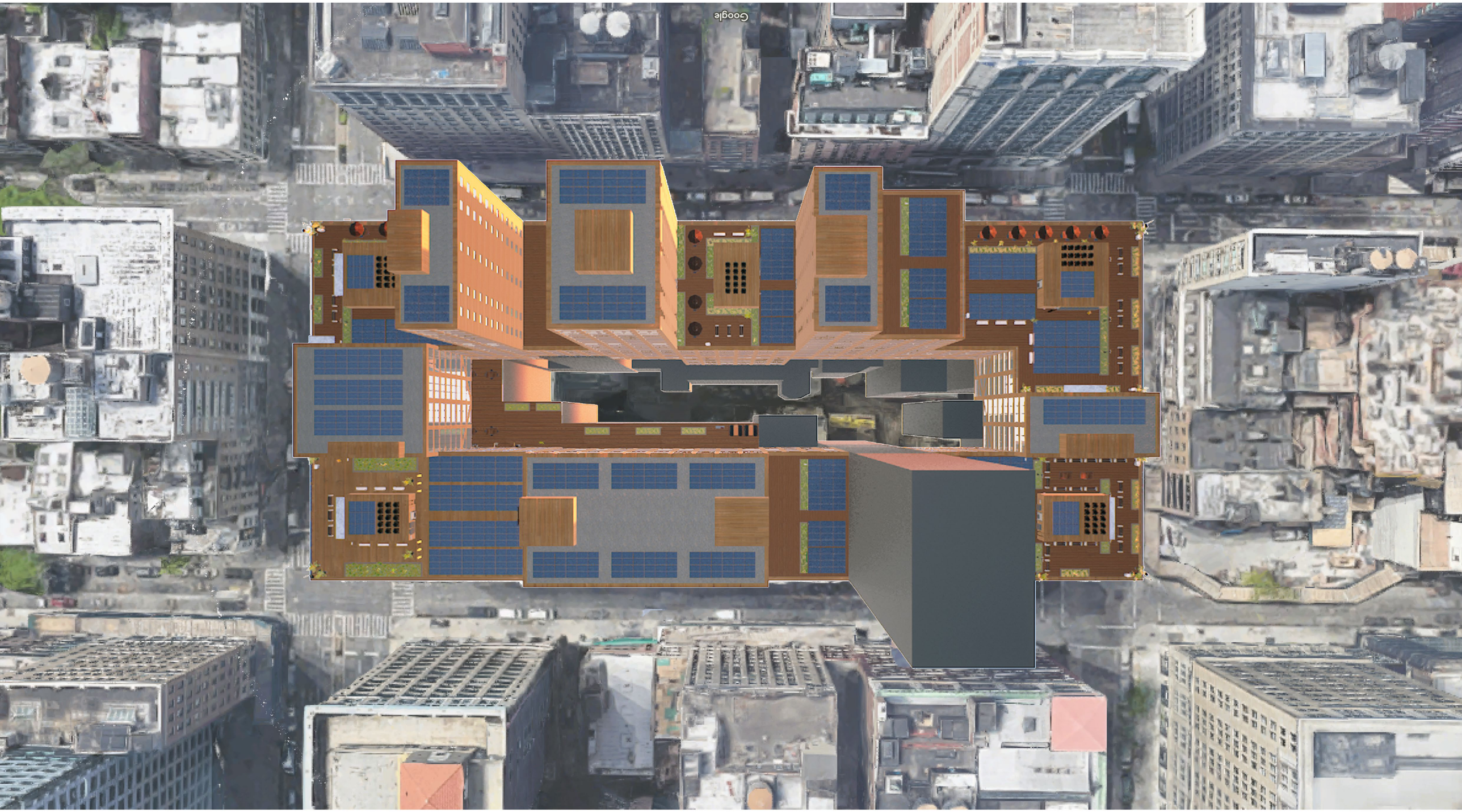
MAD HEIGHTS

affordable housing

daniel samaniego diaz



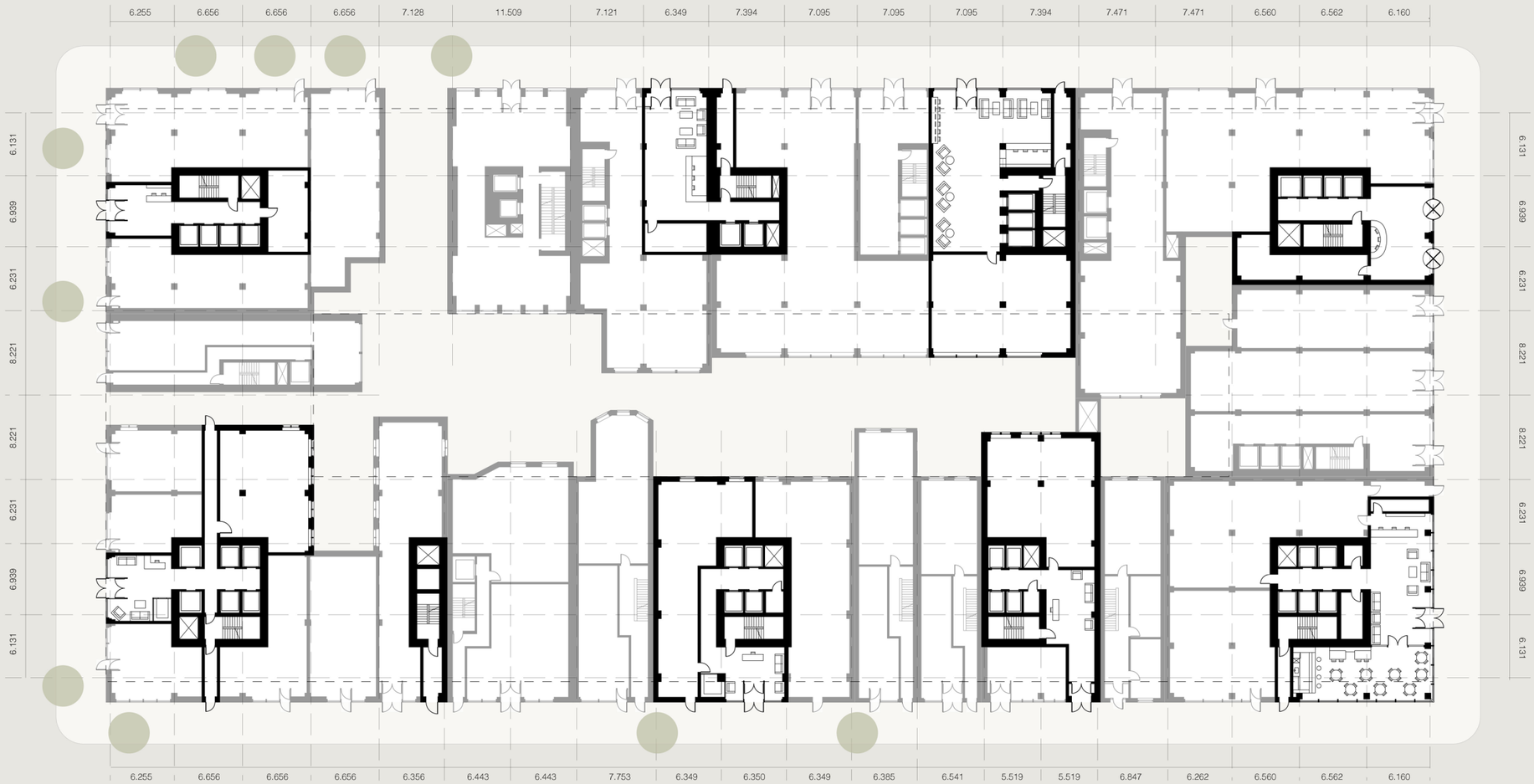
Site Plan | 1:1000


Google

Madison Avenue

Park Avenue

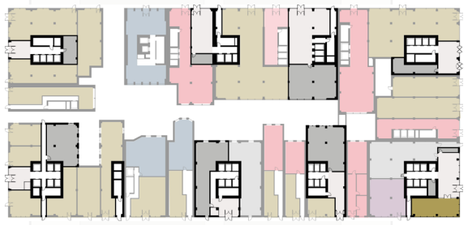
31st Street



30th Street

Ground Level Plan | 1:500

- Market-rate housing
- Affordable housing
- Accessible units
- Hostel
- Apart-Hotel
- Offices
- Retail
- Ammenities/common area
- Services
- Lobby




NATASHA DENONA
CLEANERS



Market-rate housing
Affordable housing
Accessible units
Hostel
Apart-Hotel
Offices
Retail
Ammenities/common area
Services

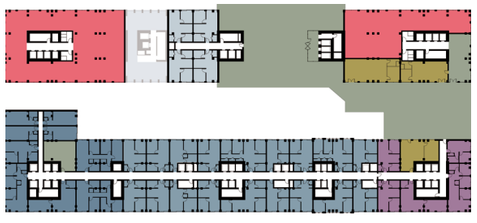


Level 10 Plan | 1:500





Market-rate housing
Affordable housing
Accessible units
Hostel
Apart-Hotel
Offices
Retail
Ammenities/common area
Services



Level 15 Plan | 1:500


BAR
ATM


EXIT



Market-rate housing
Affordable housing
Accessible units
Hostel
Apart-Hotel
Offices
Retail
Ammenities/common area
Services



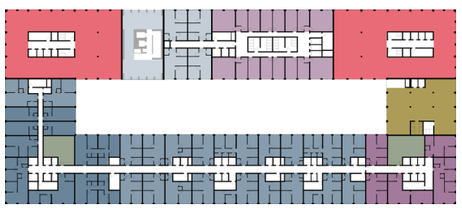
Level 17 Plan | 1:500




MAD HEIGHTS @WORK



Market-rate housing
Affordable housing
Accessible units
Hostel
Apart-Hotel
Offices
Retail
Ammenities/common area
Services



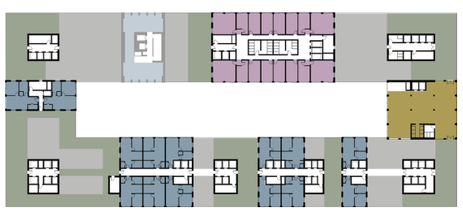
Level 20 Plan I 1:500


COLD
DRINKS





Market-rate housing
Affordable housing
Accessible units
Hostel
Apart-Hotel
Offices
Retail
Ammenities/common area
Services



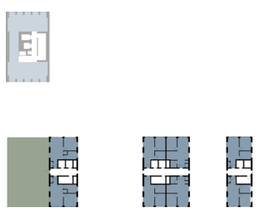
Level 23 Plan I 1:500







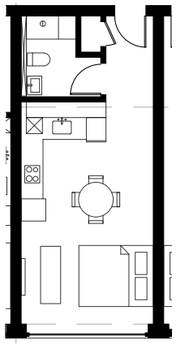
Market-rate housing
Affordable housing
Accessible units
Hostel
Apart-Hotel
Offices
Retail
Ammenities/common area
Services



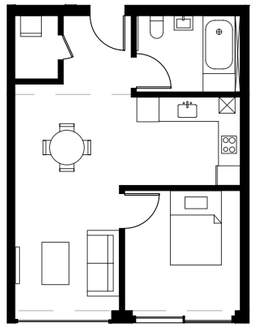
Level 30 Plan I 1:500



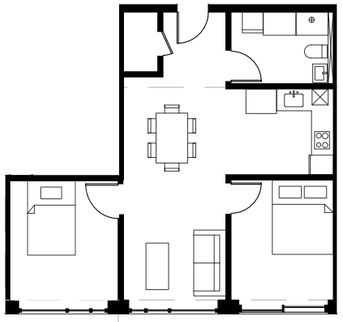




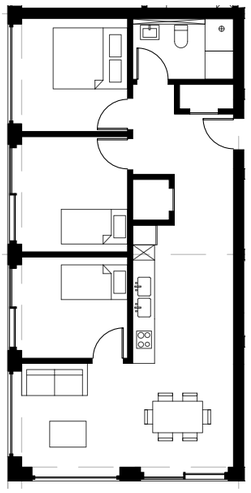
Studio



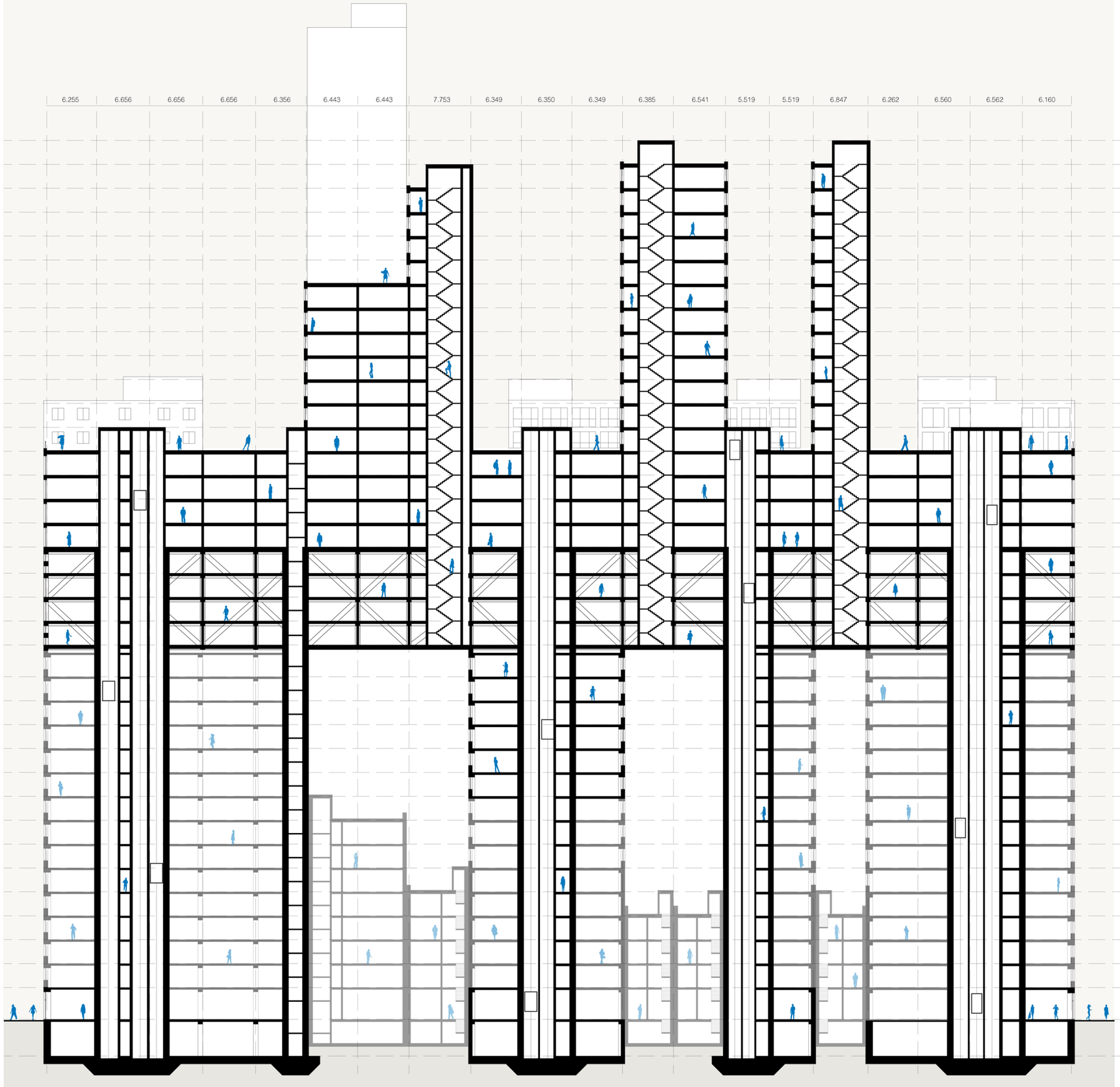
1-Bedroom



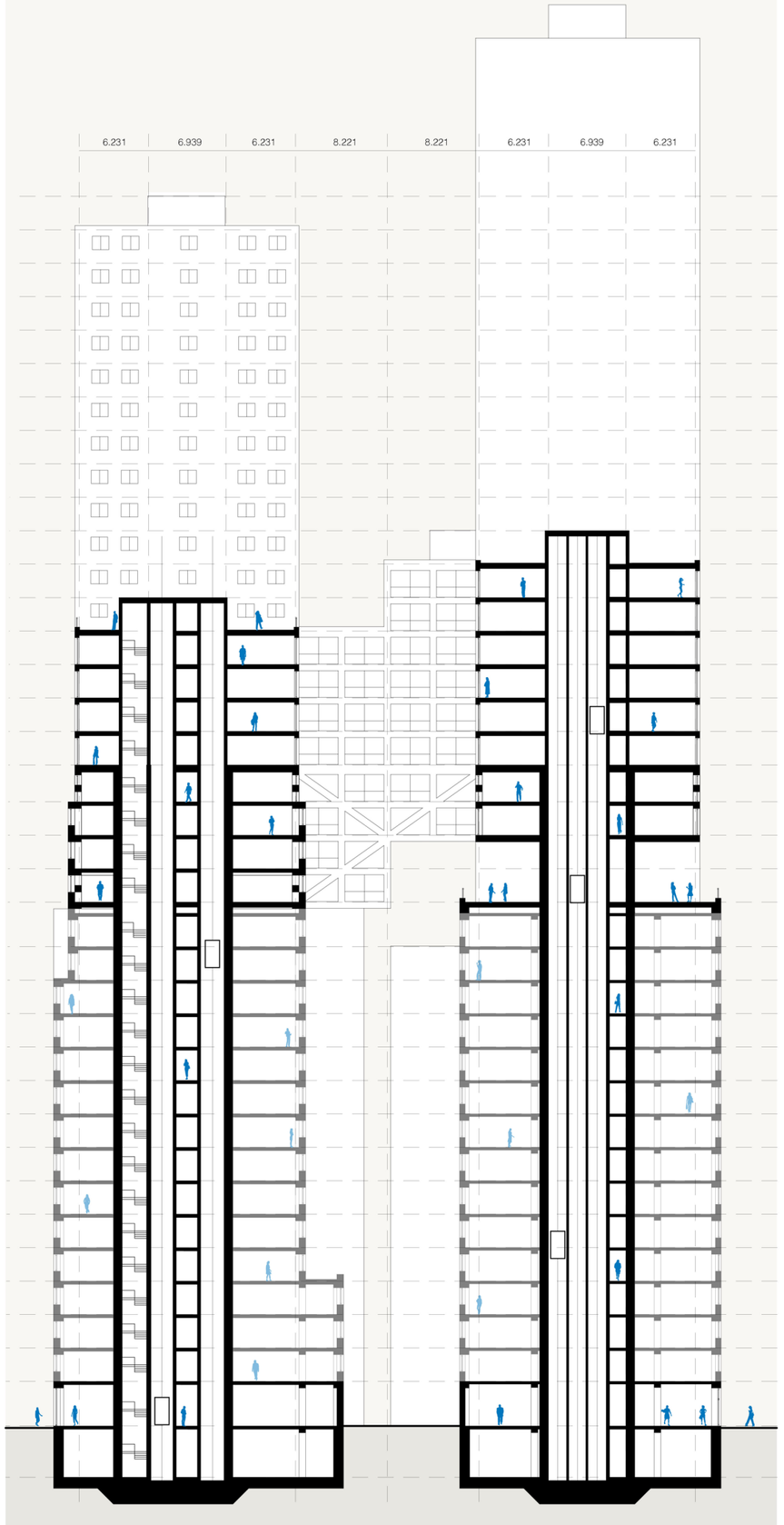
2-Bedrooms

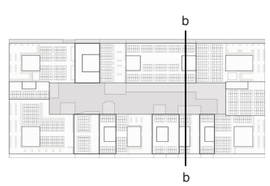


3-Bedrooms

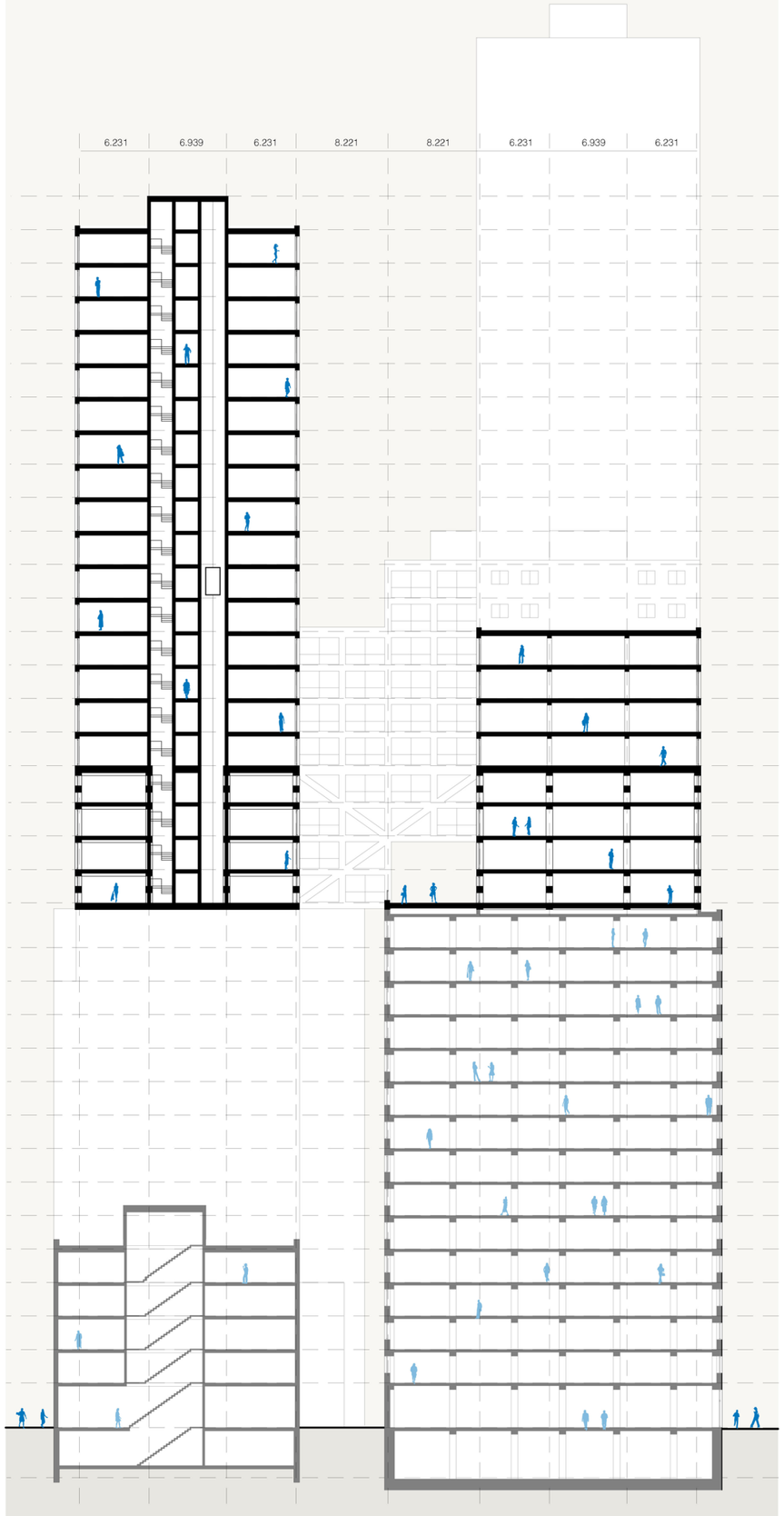


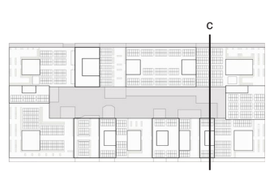
Section aa | 1:500



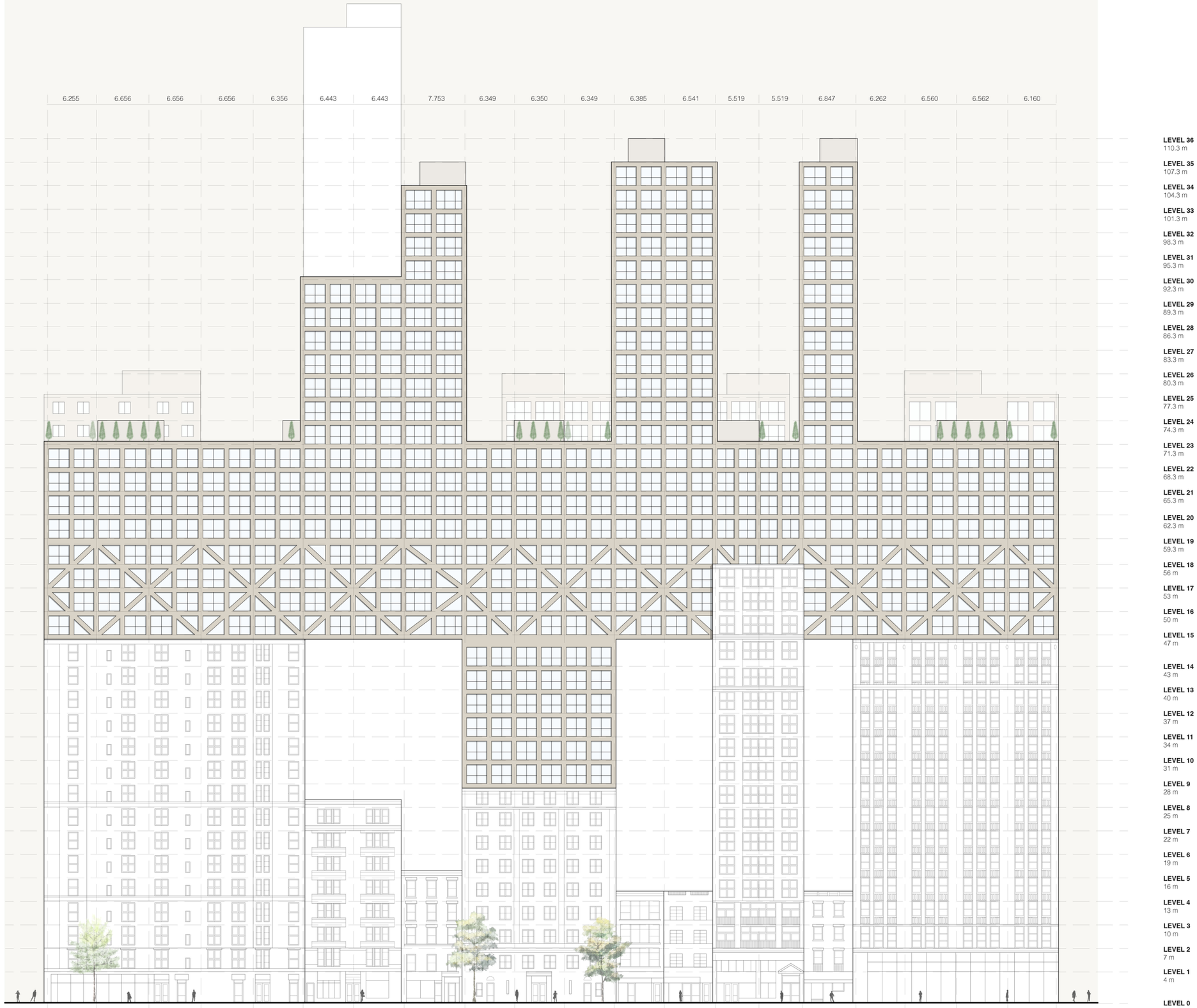


Section bb I 1:500

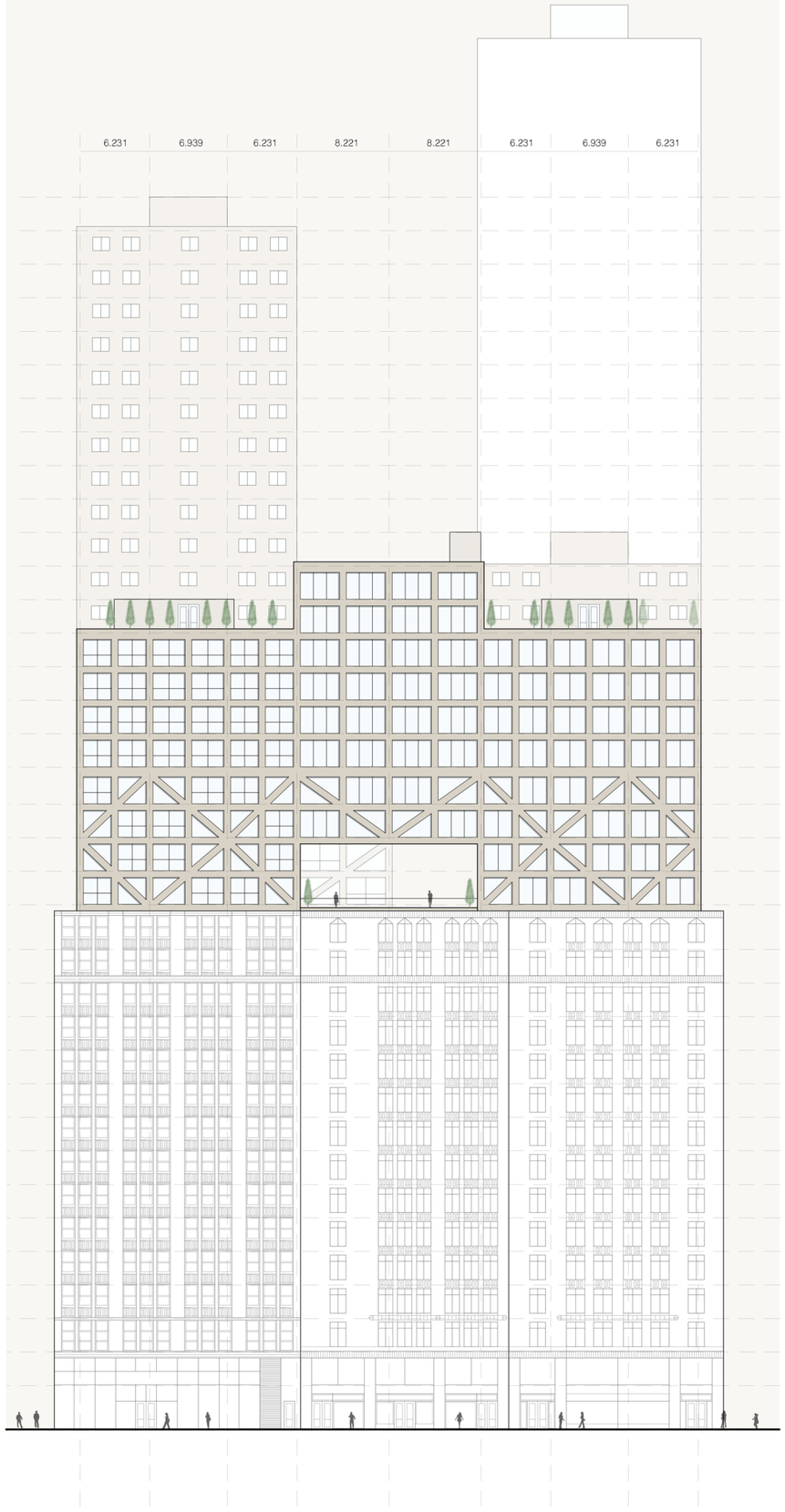




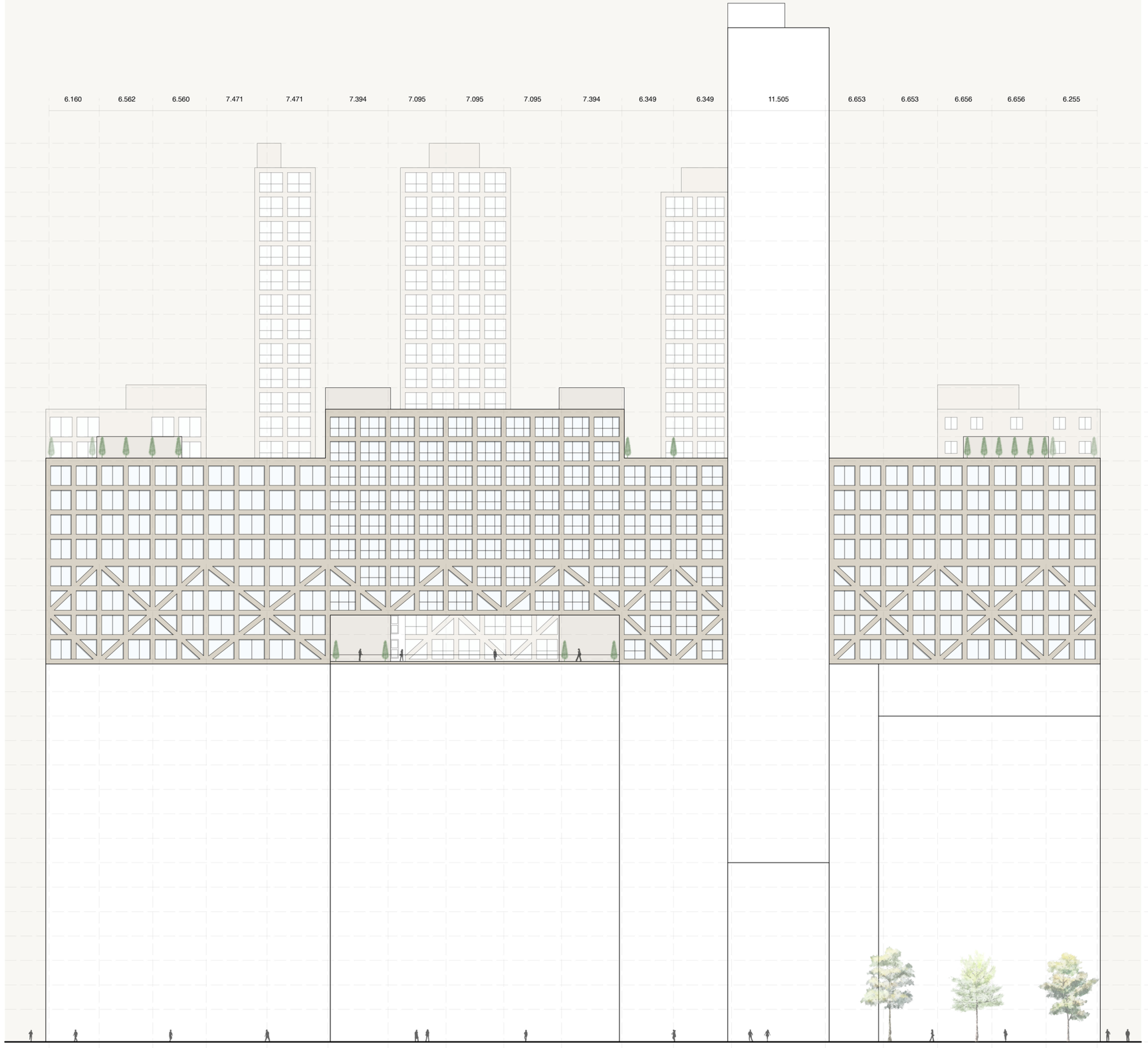
Section cc | 1:500



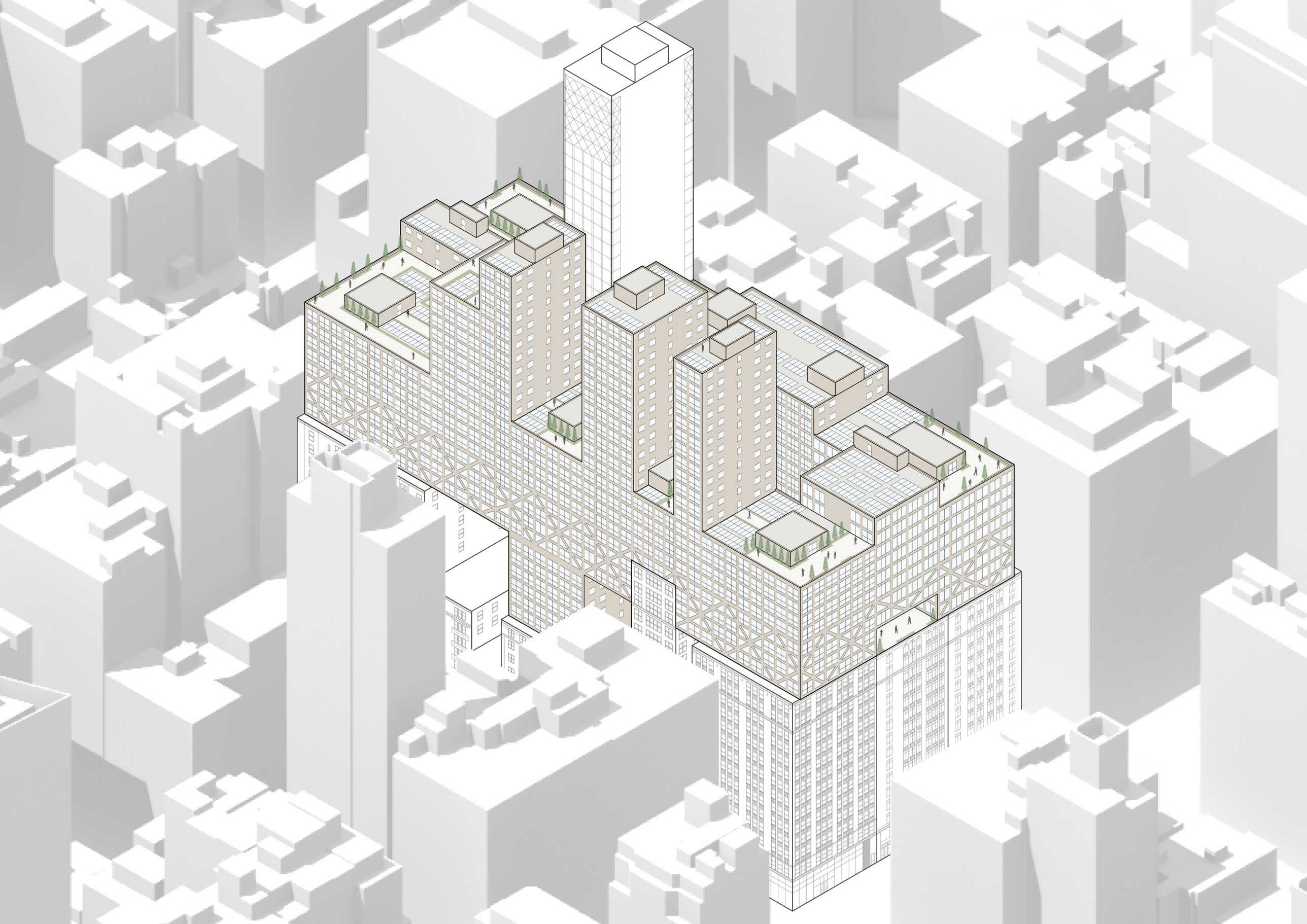
South Elevation | 1:500



East Elevation | 1:500



North Elevation | 1:500



Circulation.

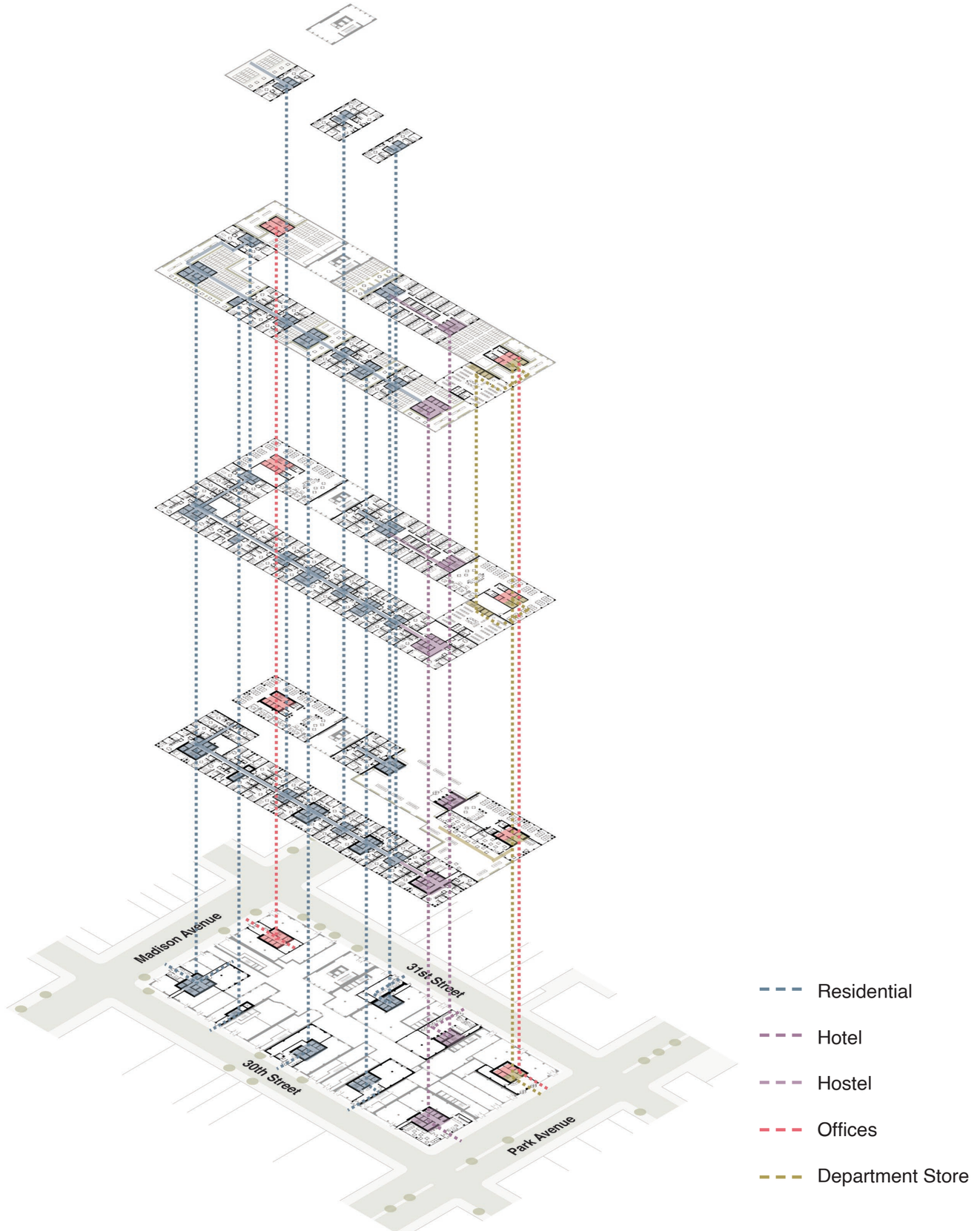
Floors 26-36

Floor 23-25

Floor 16-22

Level 15

Ground Level



Pedestrian Circulation

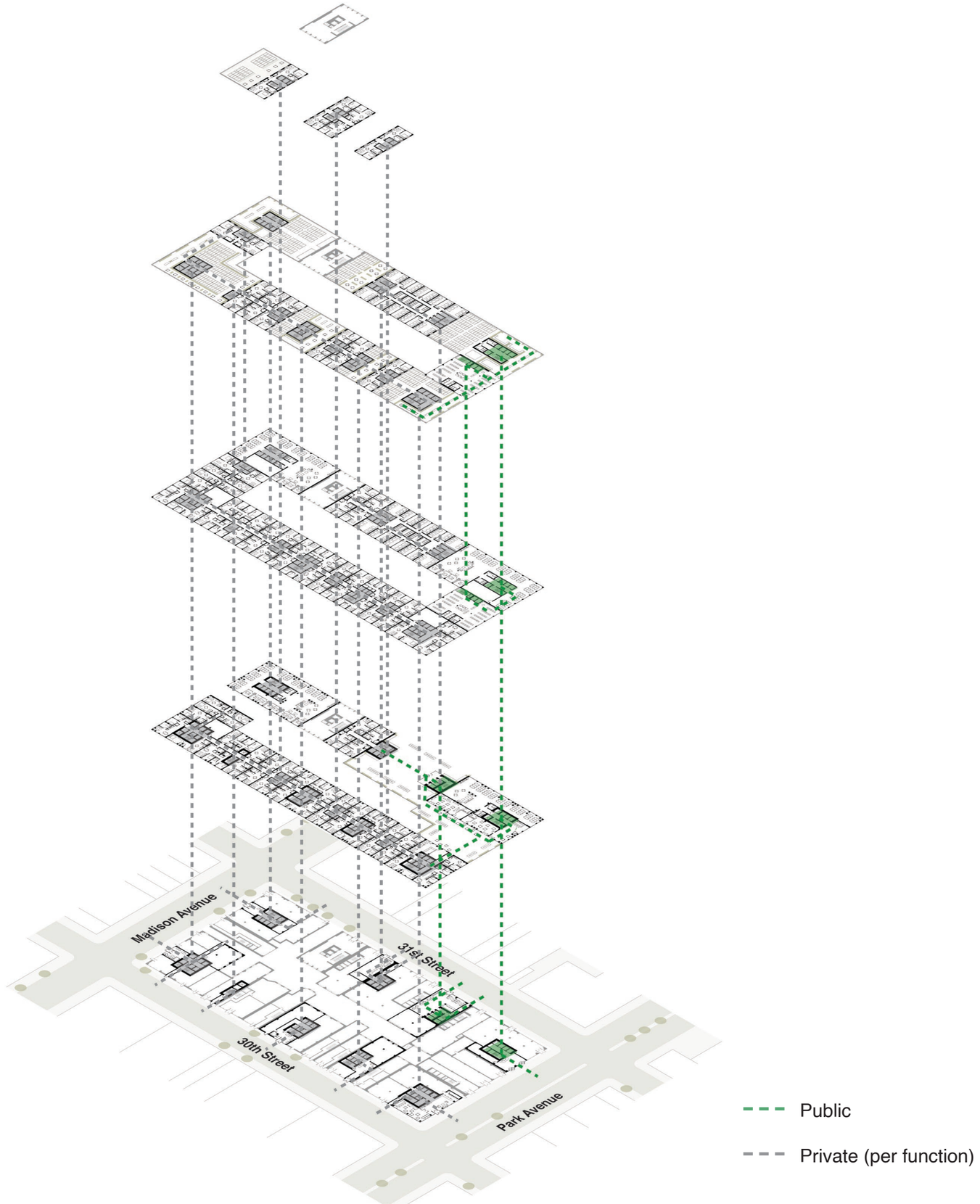
Floors 26-36

Floor 23-25

Floor 16-22

Level 15

Ground Level



Public

Private (per function)

Public vs Private

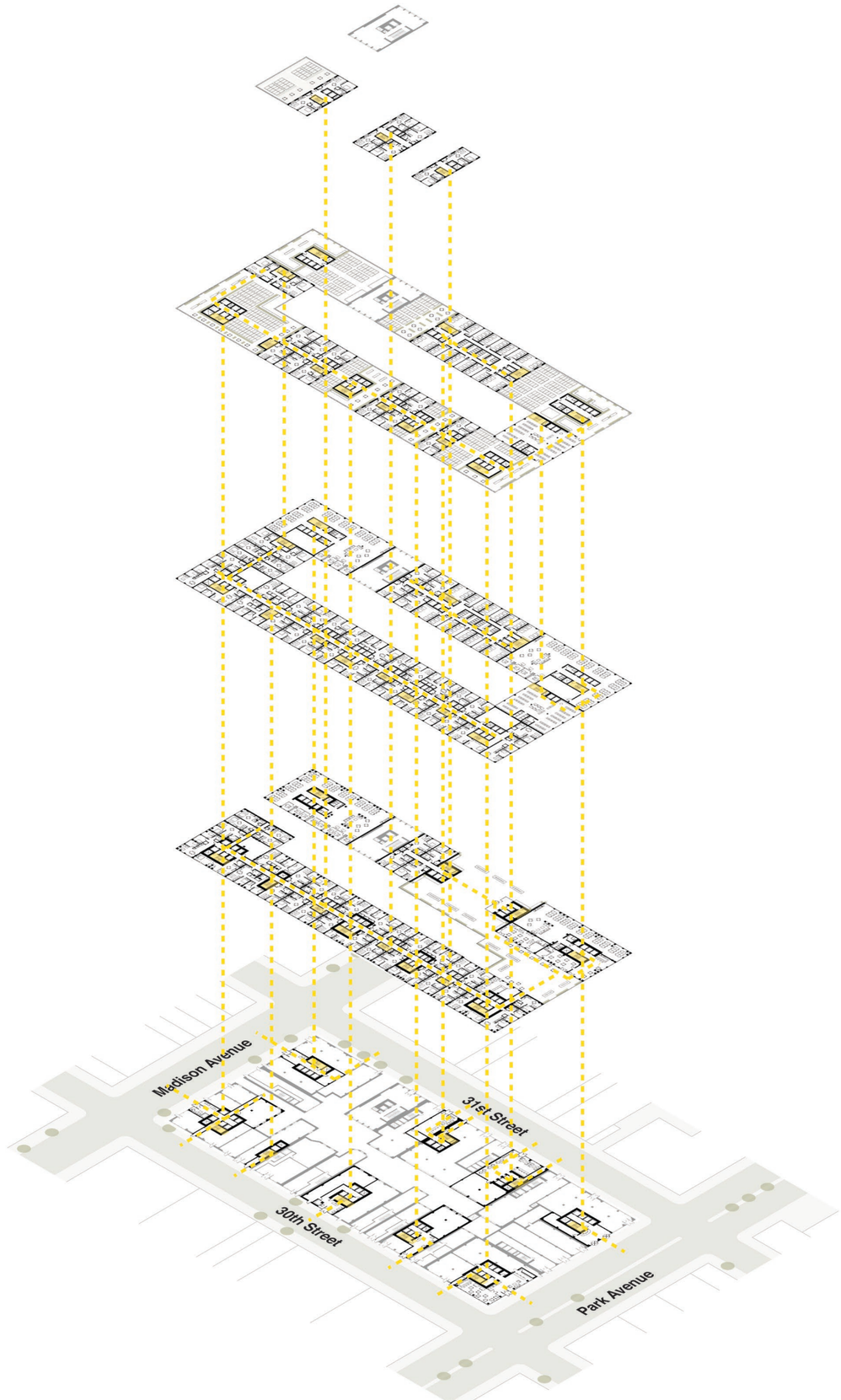
Floors 26-36

Floor 23-25

Floor 16-22

Level 15

Ground Level



Means of Egress

One set of stairs per service core (all interconnected at floors 15-22)

Assembly.

Construction Parameters

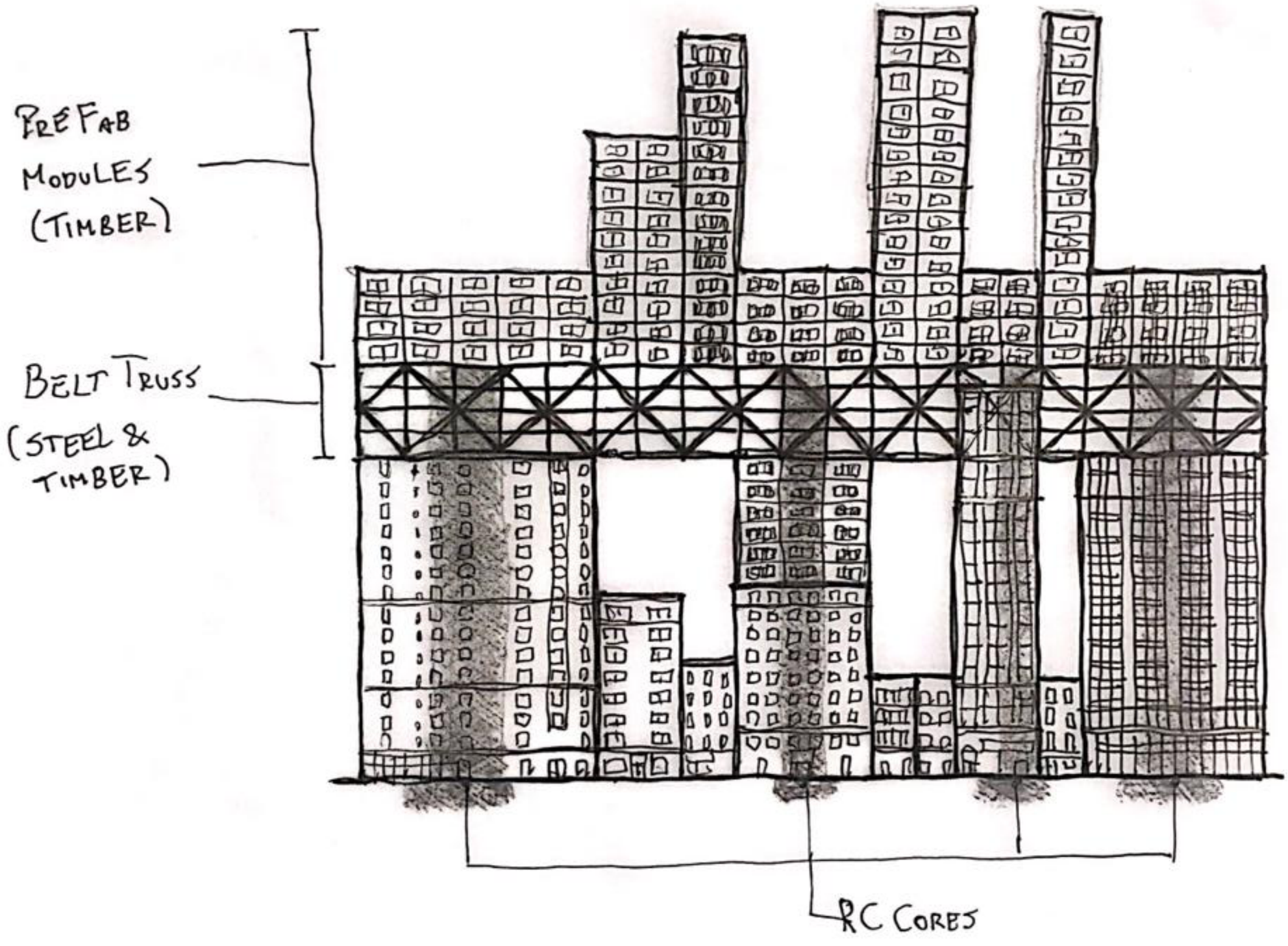
Adding Rather than Building Anew

Minimizing Environmental Impact

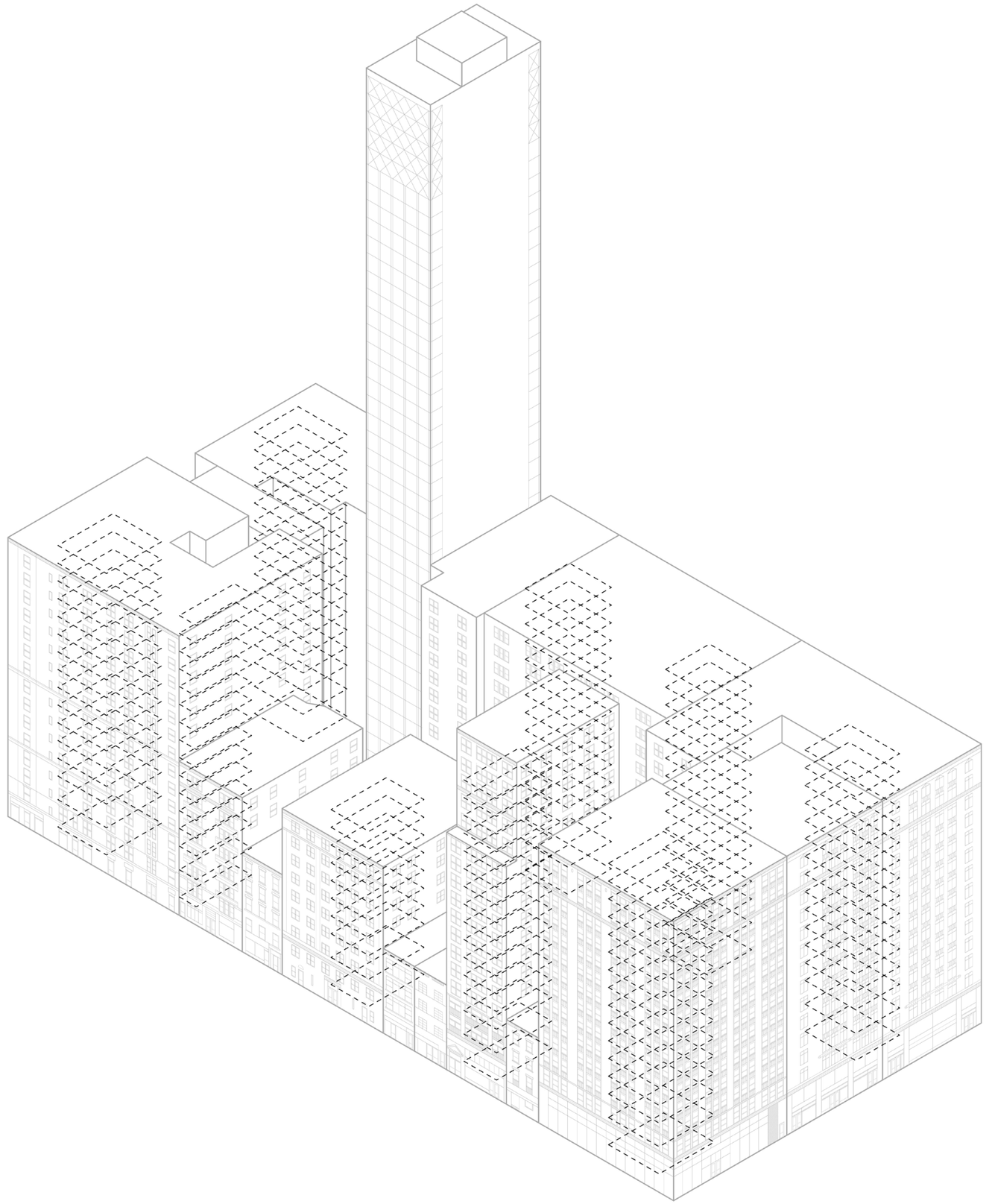
Minimizing Construction Costs

Minimizing Structural Intervention on Existing Buildings

Ease of Assembly (Time + Logistics)



Concept of Structural System

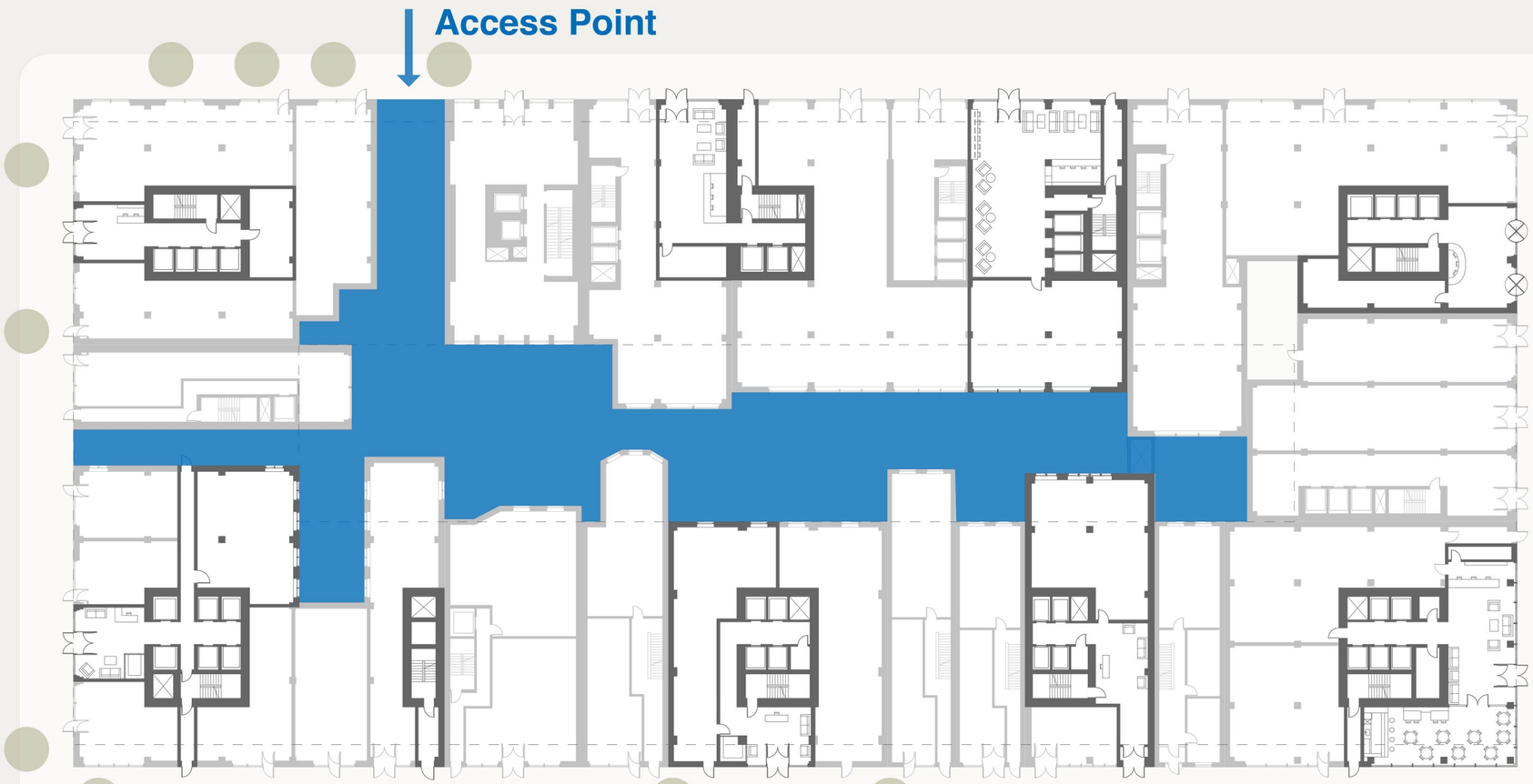


1. Location of Future Service Cores on Existing Buildings

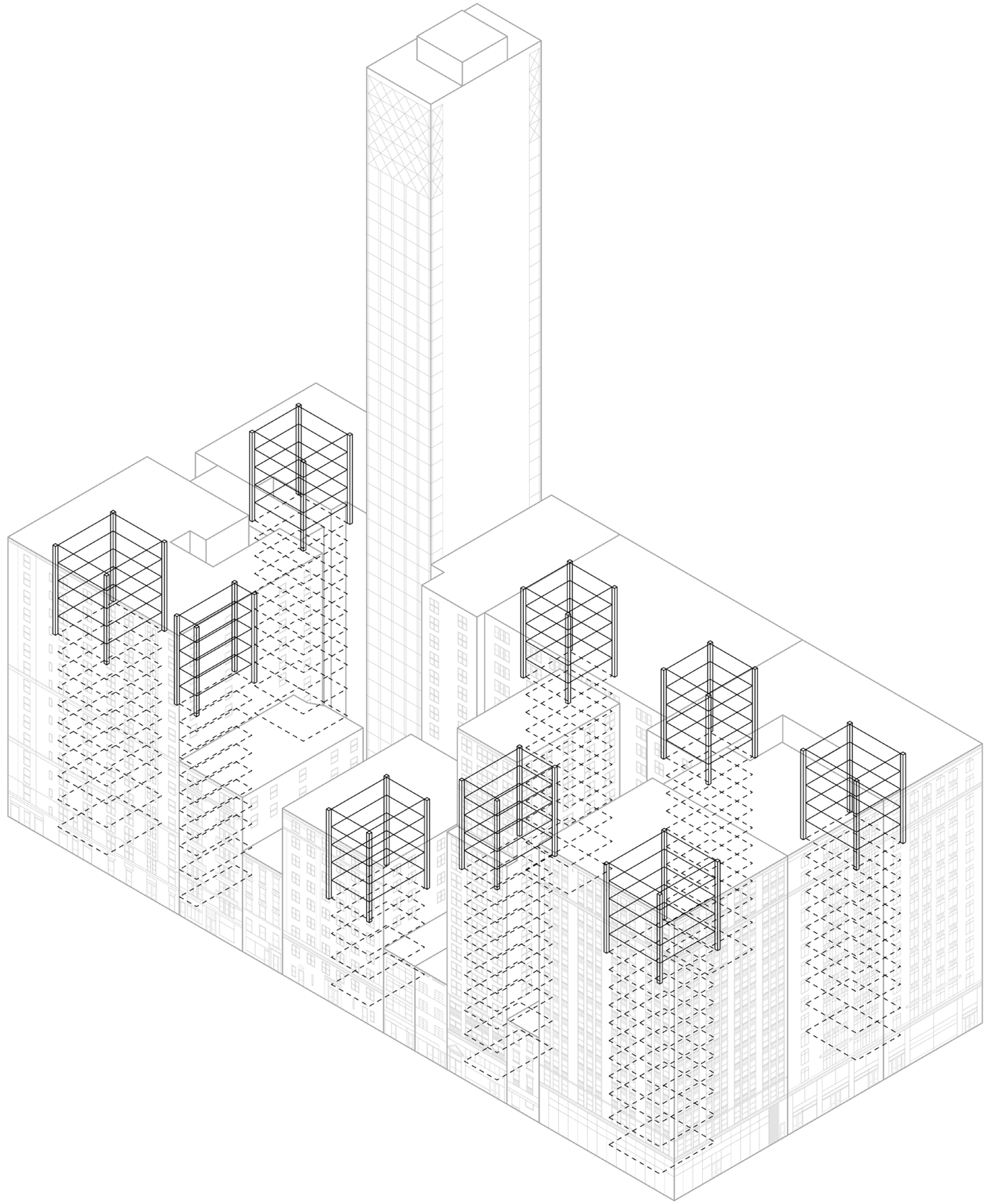
Madison Avenue

Park Avenue

31st Street



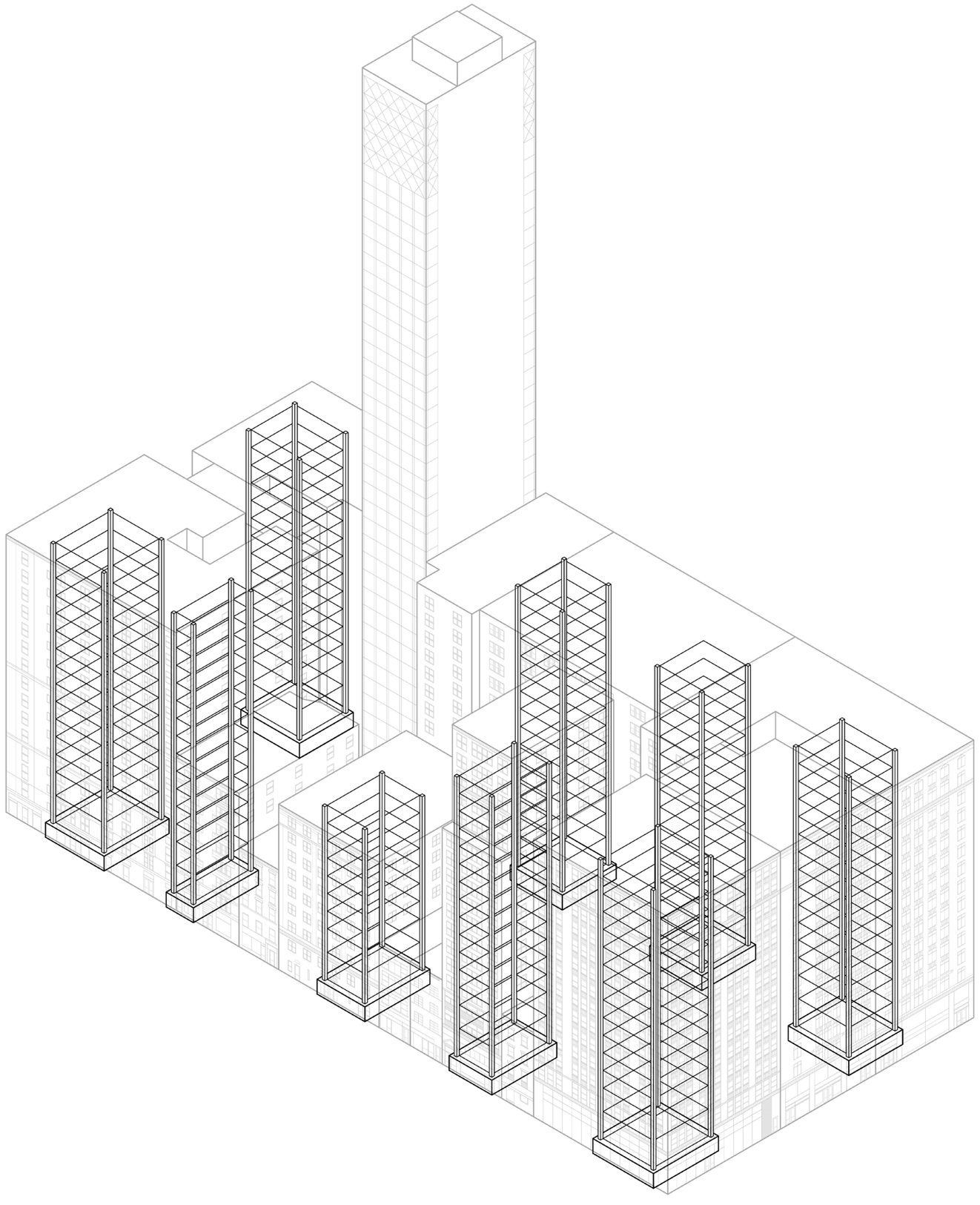
30th Street



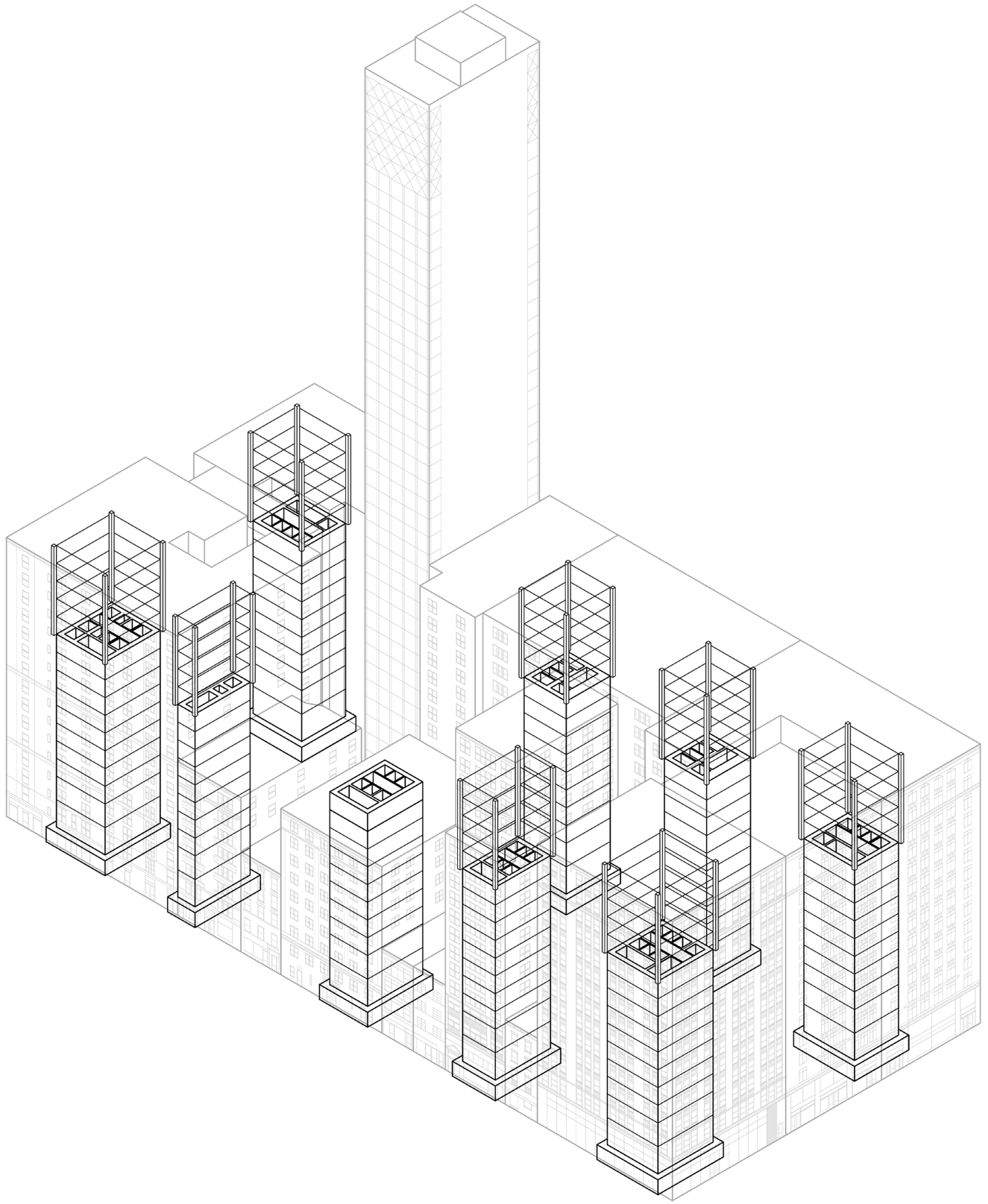
2. Perforations of Slabs + Addition of Temporary Structure (Top-Down)



Superimposition of New Service Cores on Old Ones 1:500



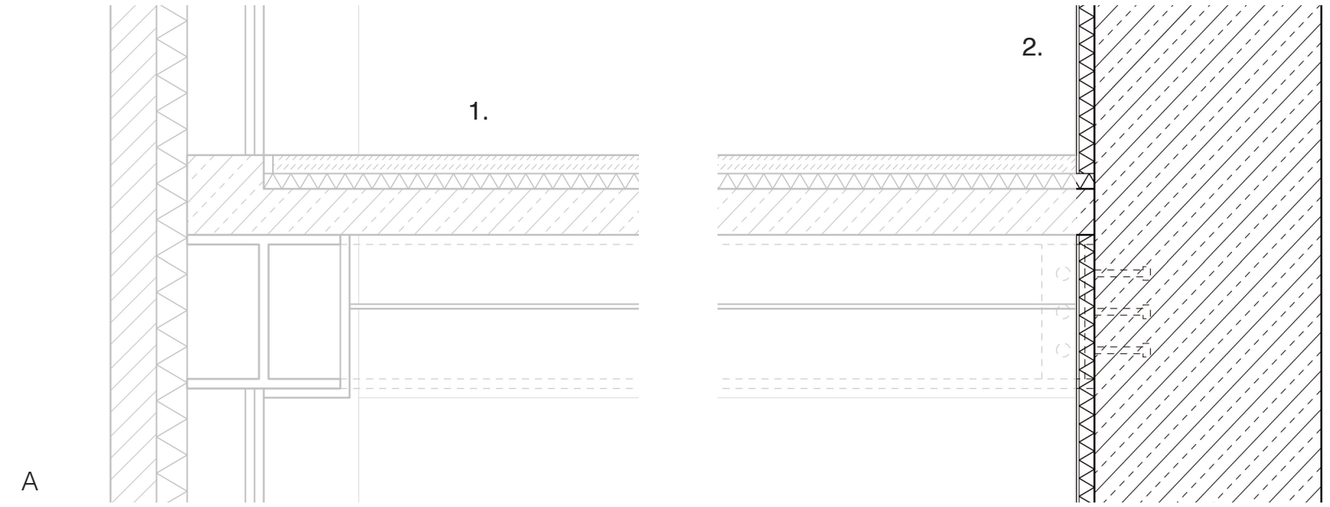
3. Foundations for Shear Concrete Service Cores

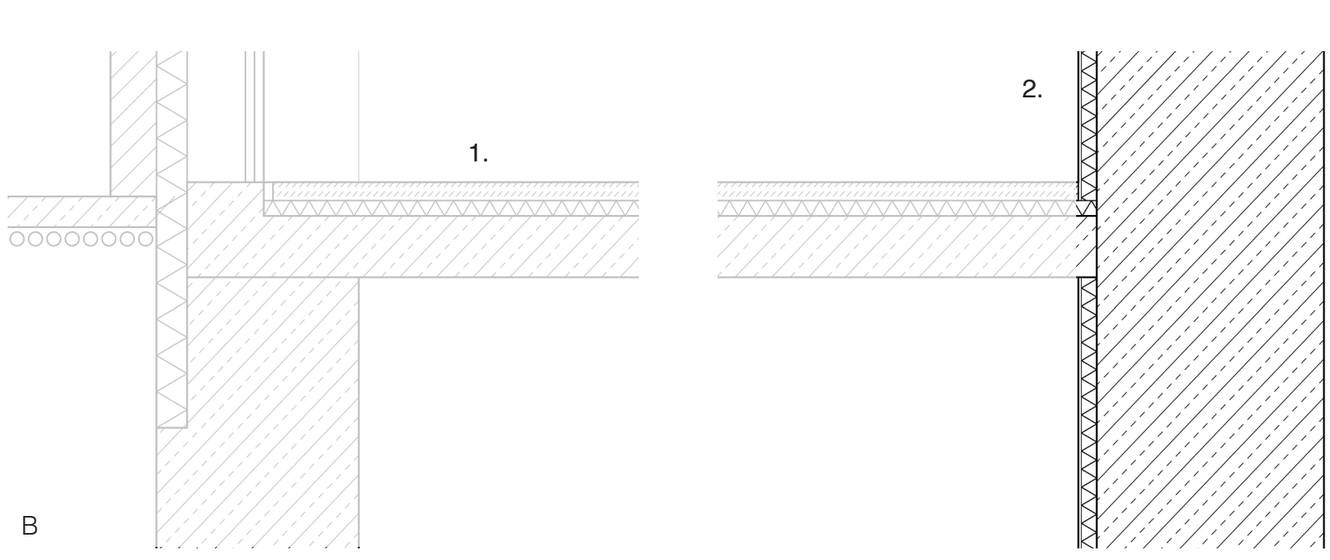


4. Slipforming Reinforced Concrete Cores (Bottom-Up)



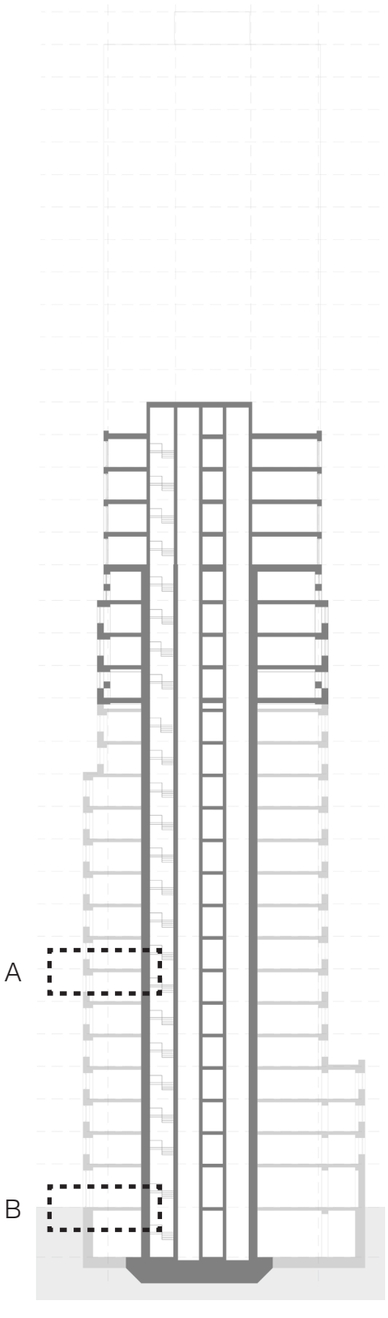
New Structural Service Cores | 1:500

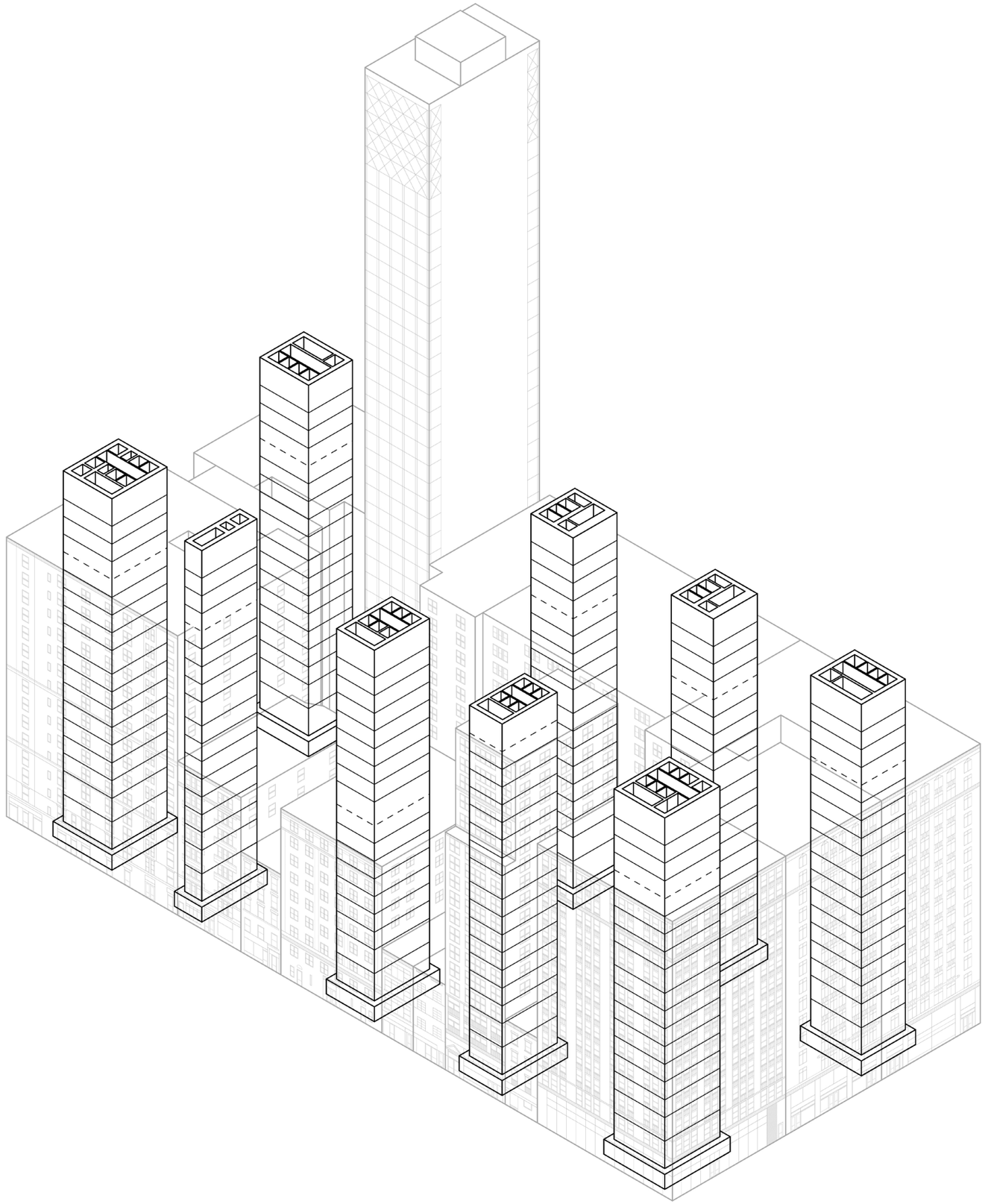




Section 1:20

1. Existing building floor slab:
   Flooring
   Heating Screed
   Concrete Topping
   Steel Beam
2. Wall:
   Plasterboard 15 mm
   Thermal Insulation, 50 mm
   Reinforced Concrete, 800 mm

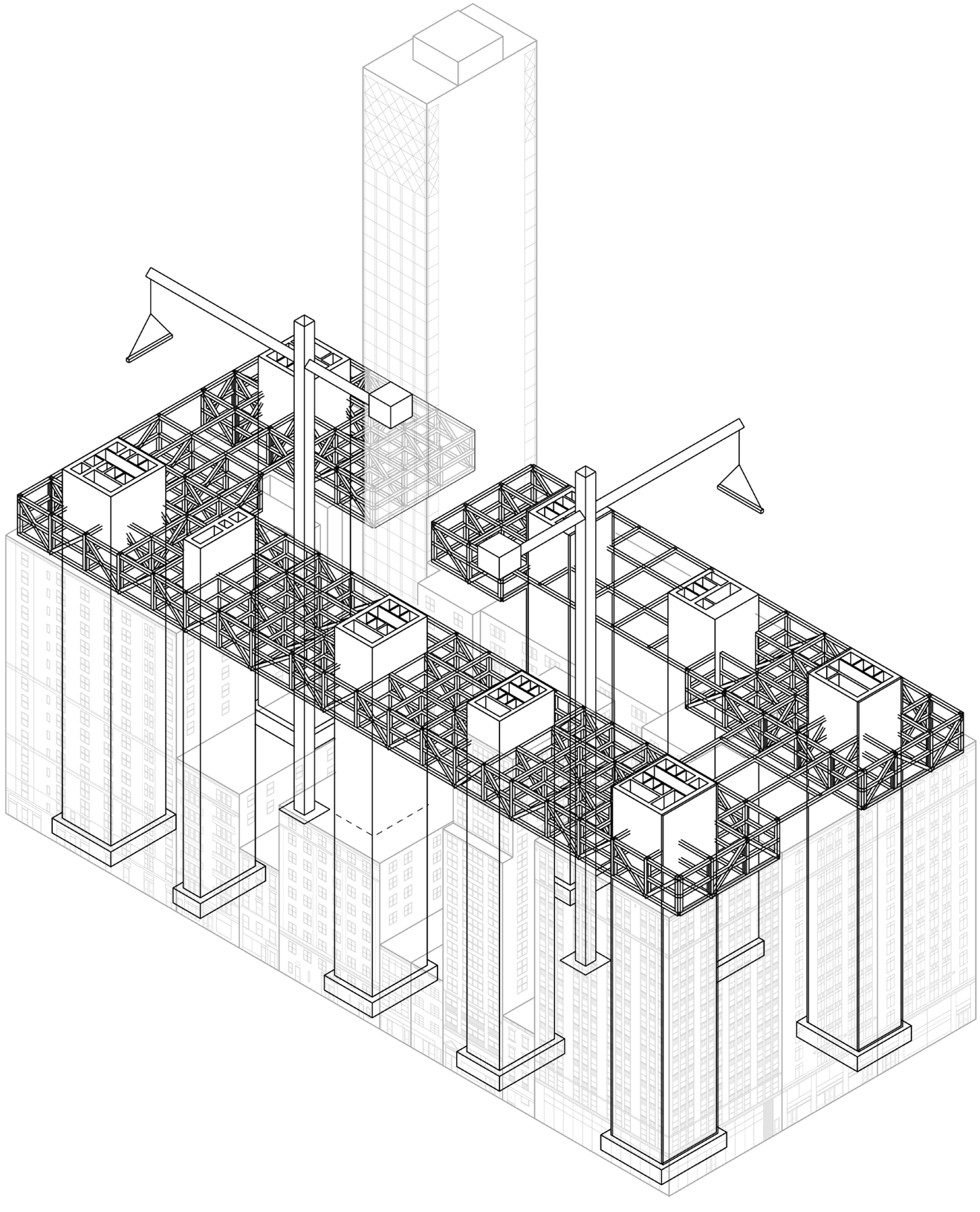




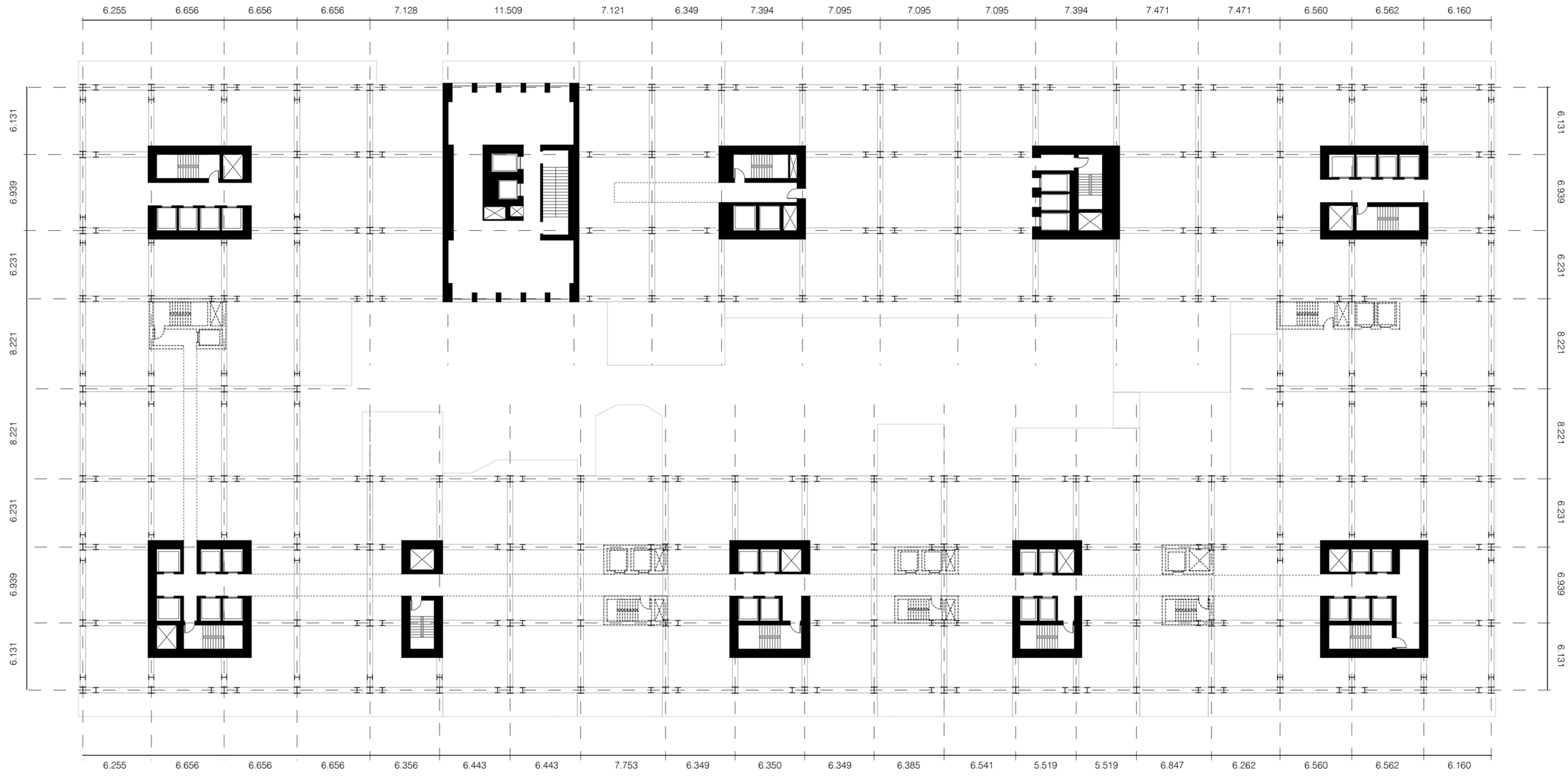
5. Shear Concrete Service Cores



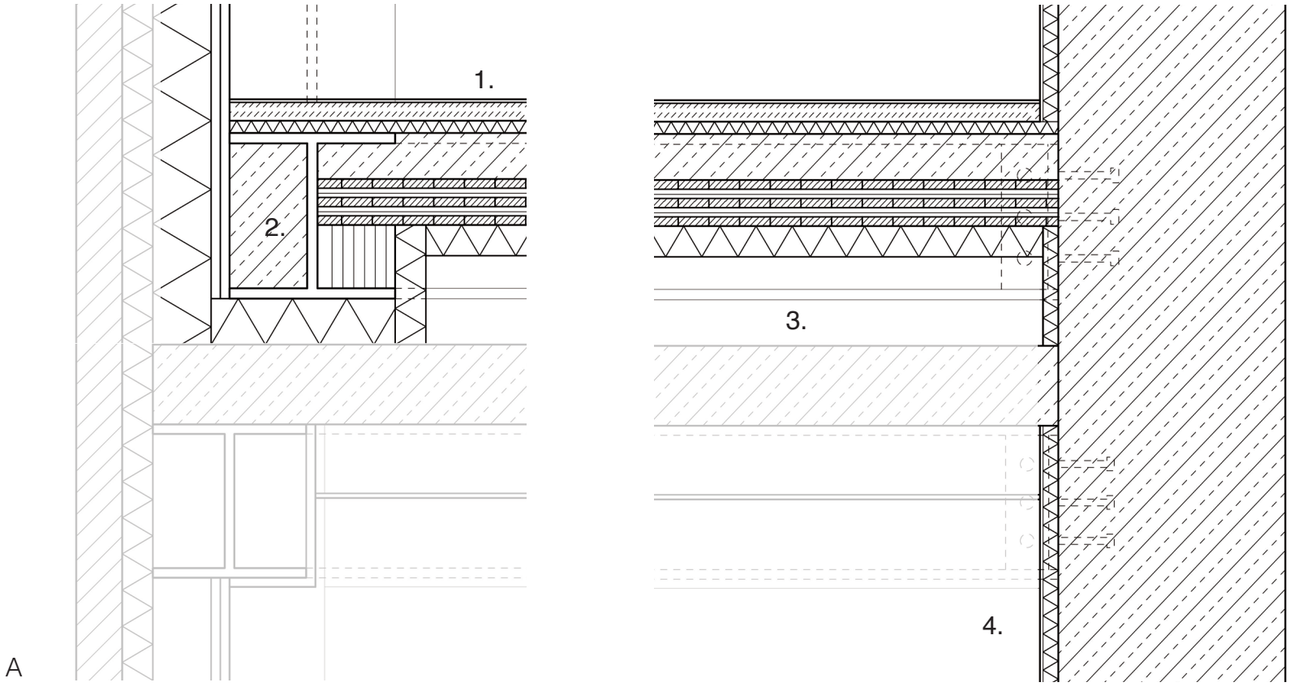
New Building Layouts | 1:500

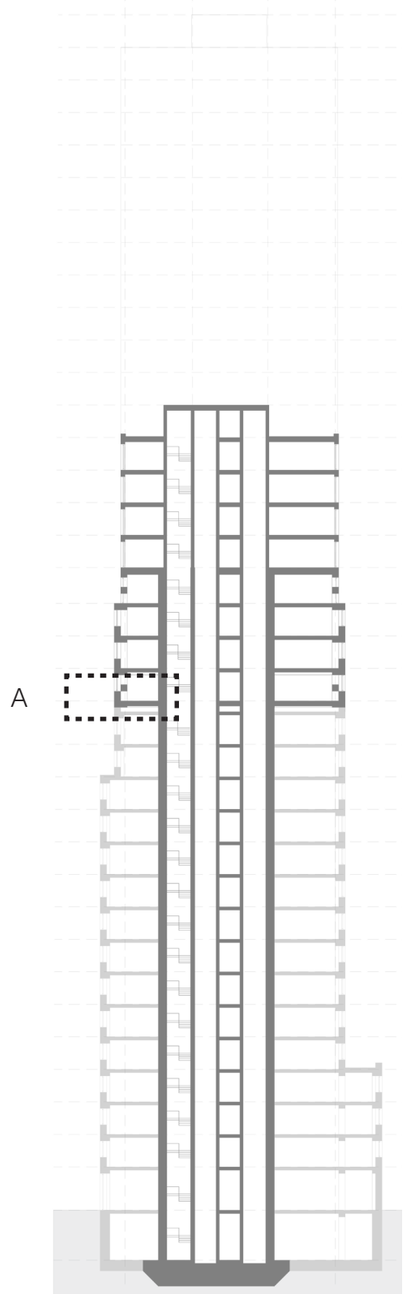


6. Assembly of Steel Outrigger System



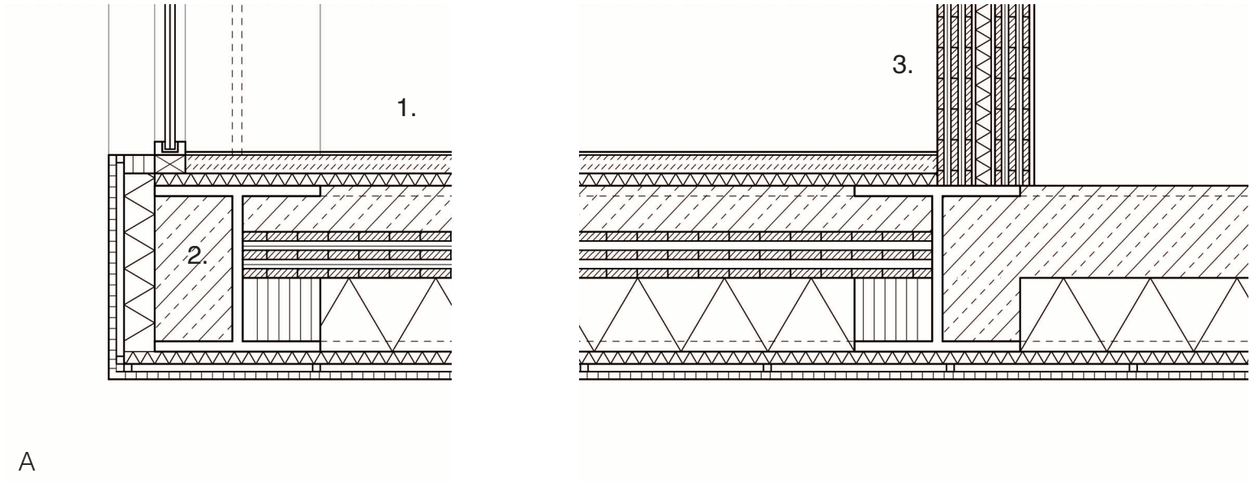
Truss System Structural Plan | 1:400

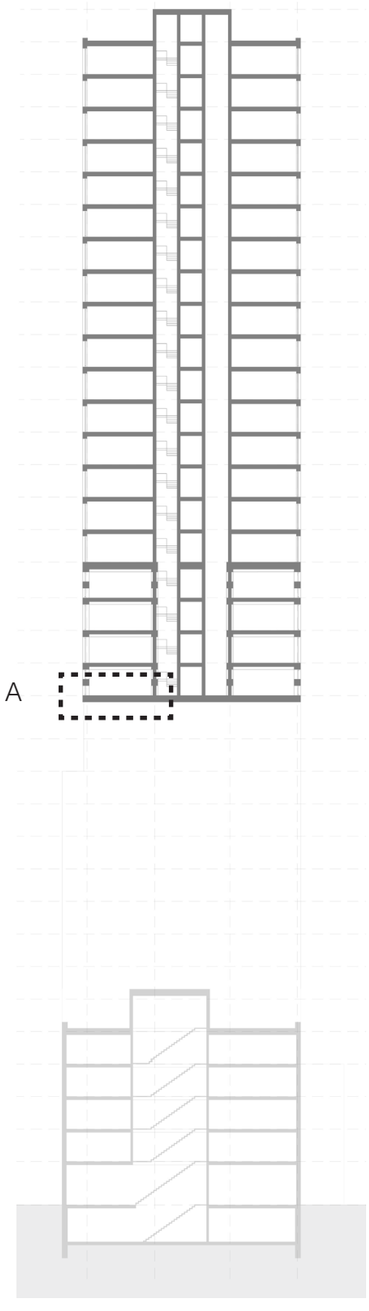




Section 1:20

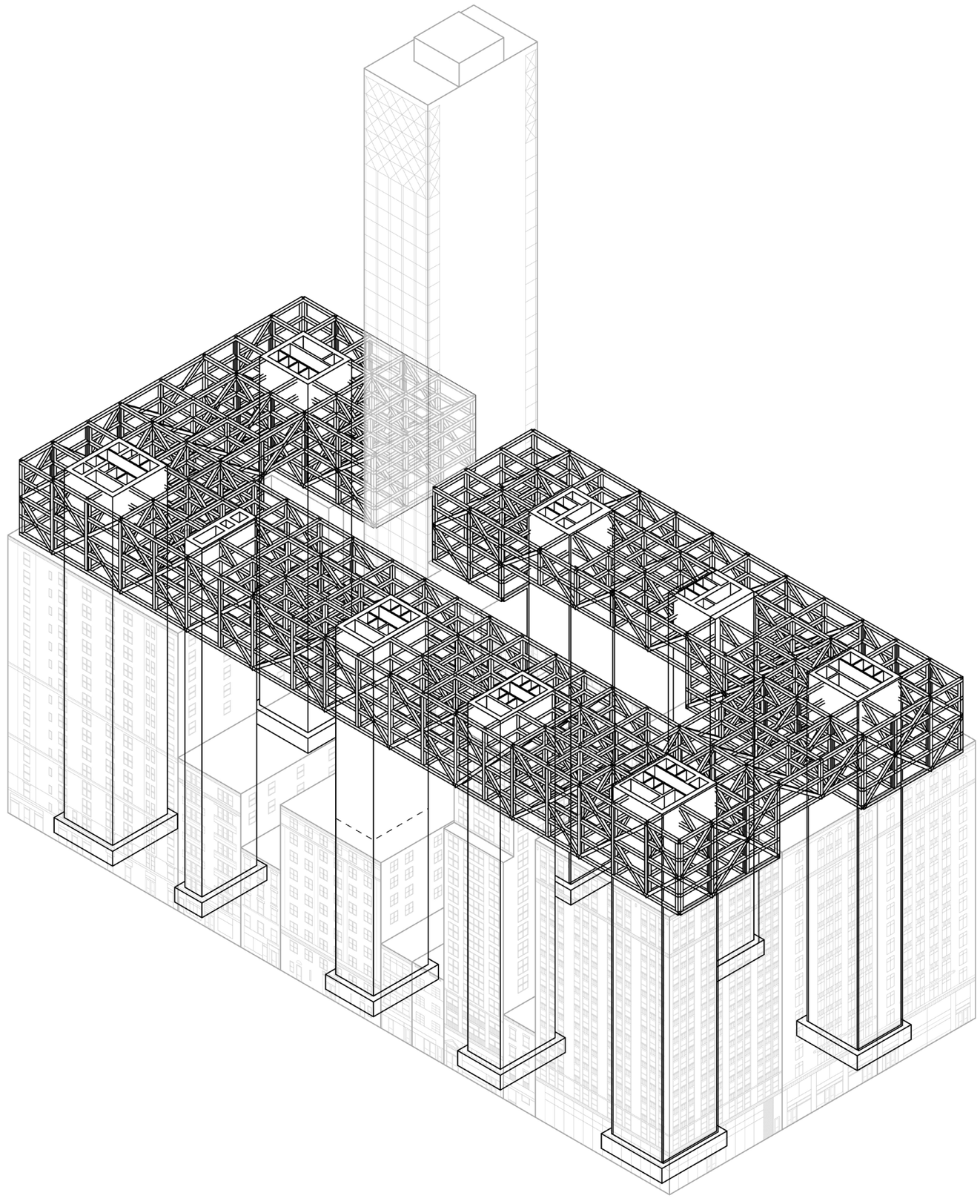
1. Floor slab:
   Flooring parquet, 15 mm
   Heating screed, 40 mm
   Impact sound insulation, 30 mm
   Concrete topping, reinforced 200 mm
   Cross-laminated timber, 140 mm
   Thermal insulation, 150 mm
2. Steel beam, HEB 550
   Plasterboard, (fire prevention) 2 mm
3. Existing building ceiling slab:
   Concrete topping
   Steel beam
4. Wall:
   Plasterboard 15 mm
   Thermal insulation, 50 mm
   Reinforced concrete, 800 mm



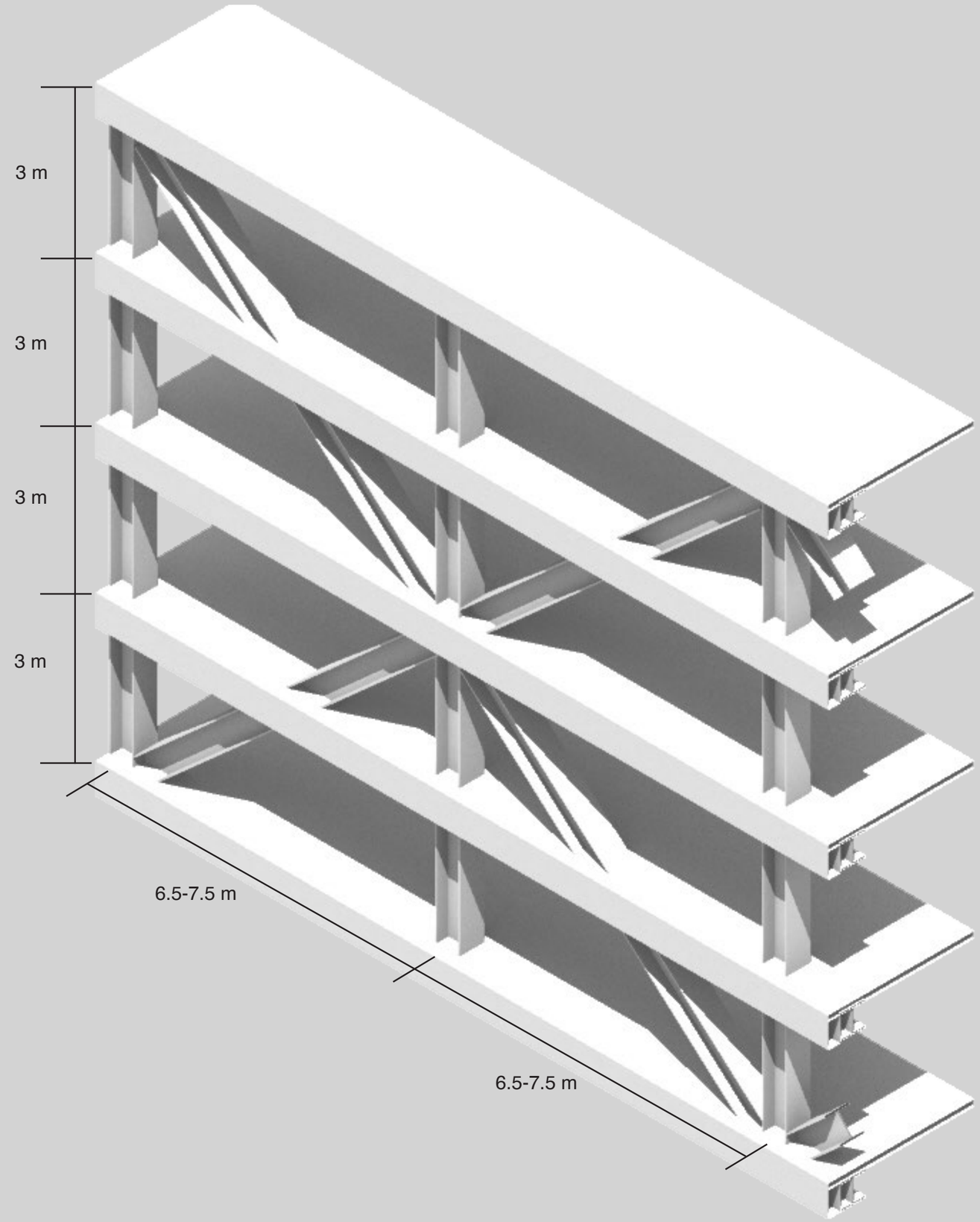


Section 1:20

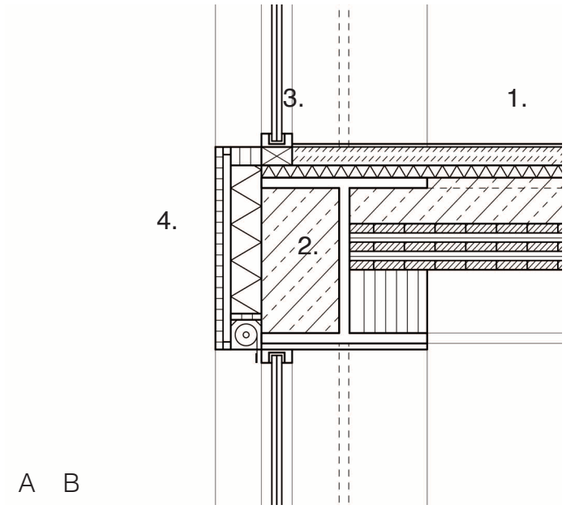
1. Floor slab:
   Flooring parquet, 15 mm
   Heating screed, 40 mm
   Impact sound insulation, 30 mm
   Concrete topping, reinforced 200 mm
   Cross-laminated timber, 140 mm
   Thermal insulation, 200 mm
   Rear ventilation layer, 30 mm
   Exterior cladding, 30 mm
2. Steel beam, HEB 550
   Plasterboard, (fire prevention) 2 mm
3. Wall:
   Cross-laminated timber panel, 120 mm
   Plasterboard 15 mm
   Thermal insulation, 50 mm
   Air layer, 15 mm
   Plasterboard 15 mm
   Cross-laminated timber panel, 120 mm

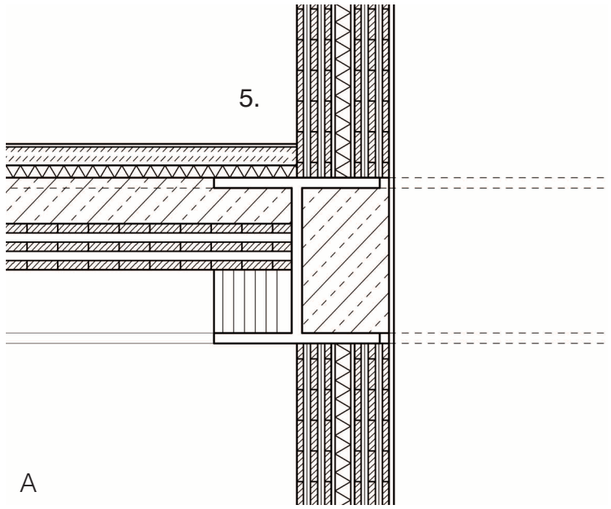


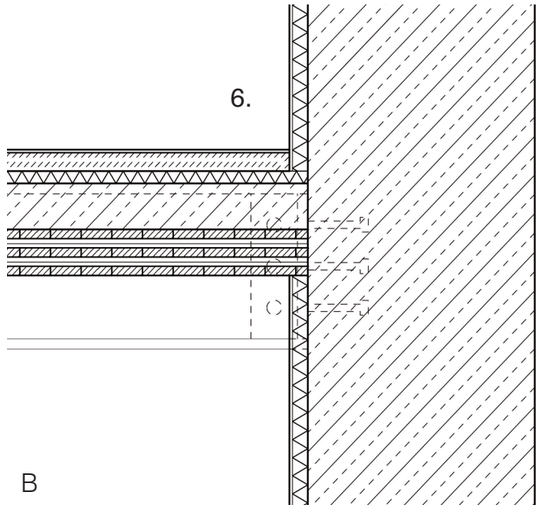
7. Belt Truss + Finished Assembly of Concrete/Timber Slabs and Walls



Outrigger system of steel beams, HEB 550
Braced frame of four stories high

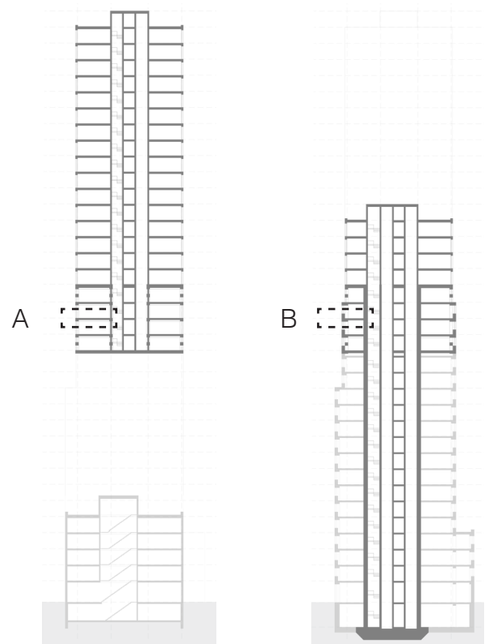


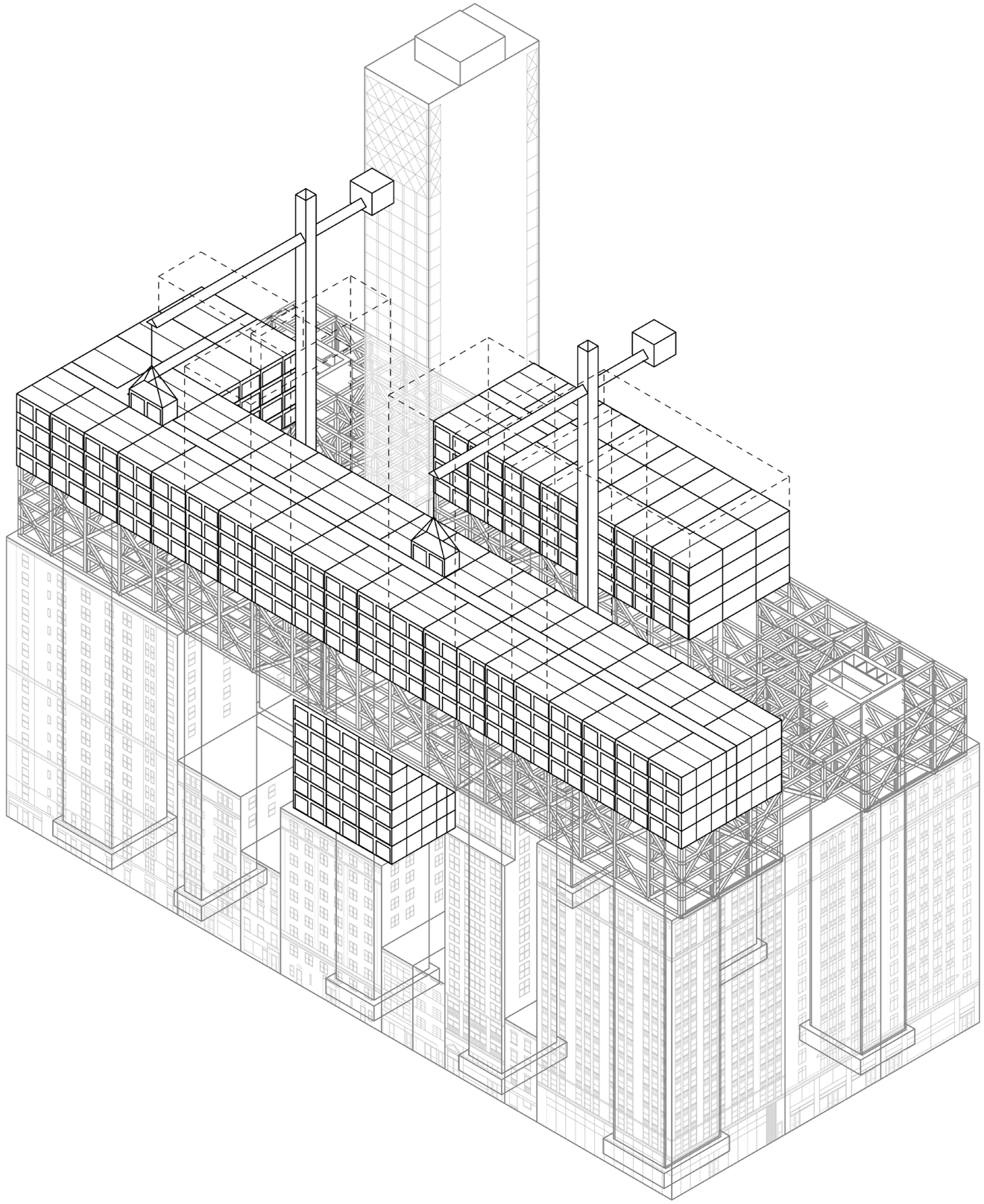




Section 1:20

1. Floor slab:
   Flooring parquet, 15 mm
   Heating screed, 40 mm
   Impact sound insulation, 30 mm
   Concrete topping, reinforced 200 mm
   Dowel-laminated timber, 140 mm
   Thermal insulation, 150 mm
2. Steel beam, HEB 550
   Plasterboard, (fire prevention) 2 mm
3. Exterior glazing
   Masonry cladding (existing), 150 mm
   Steel studs substructure (existing), 100 mm
   Thermal Insulation 150 mm
   Gypsum board, 10 mm
4. Exterior wall
   Spruce, painted larch, 25 mm
   Wooden substructure 20 mm
   Thermal insulation, 100 mm
5. Interior Wall
   Cross-laminated timber panel, 120 mm
   Plasterboard, 12 mm
   Thermal insulation, 50 mm
   Air layer, 15 mm
   Cross-laminated timber panel, 120 mm
6. Interior Wall:
   Plasterboard 15 mm
   Thermal insulation, 50 mm
   Reinforced concrete, 800 mm





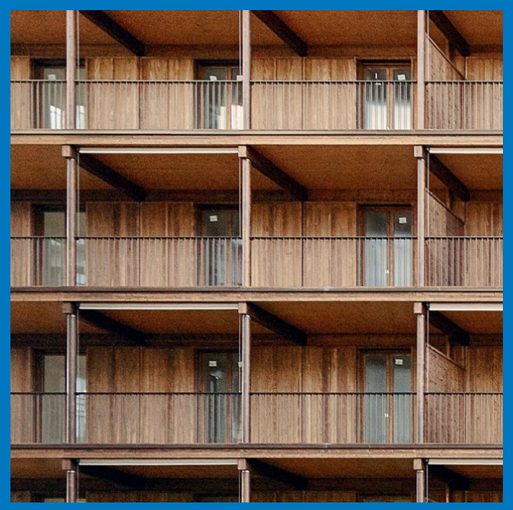
8. Addition of Timber Prefabricated Modules







Why Timber?







Better Life-Cycle Assessments

Carbon footprint of the building's assembly and maintenance

Potential cost savings of finite raw materials

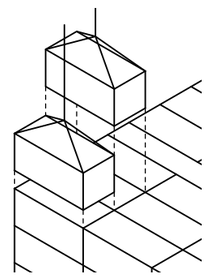
Potential of dismantling to reuse/recycle

Availability in the states of NY and NJ: Katerra

Healthy indoor climate

Why Modular Prefabrication?

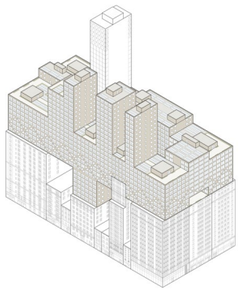
Shorter assembly time on site



Economic advantages: save material use and construction time

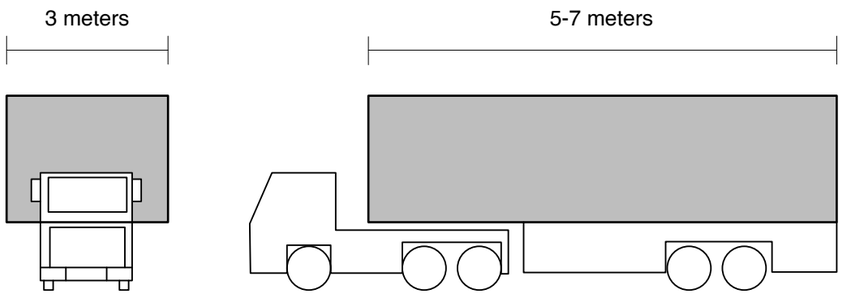


Apt for regular layout and sheer size

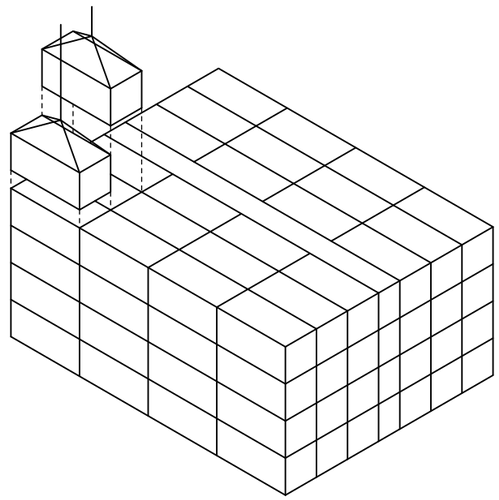


Timber Prefabricated Modules

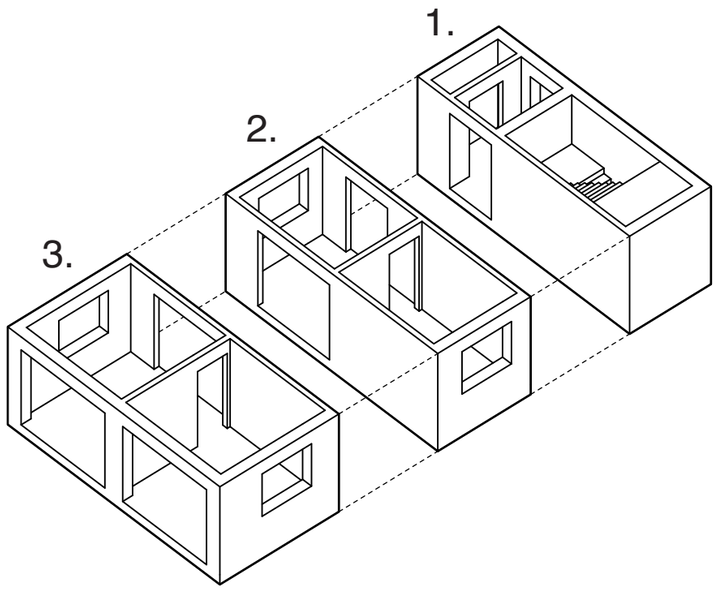
Material Supply by: KATERRA



Ease of Transportation



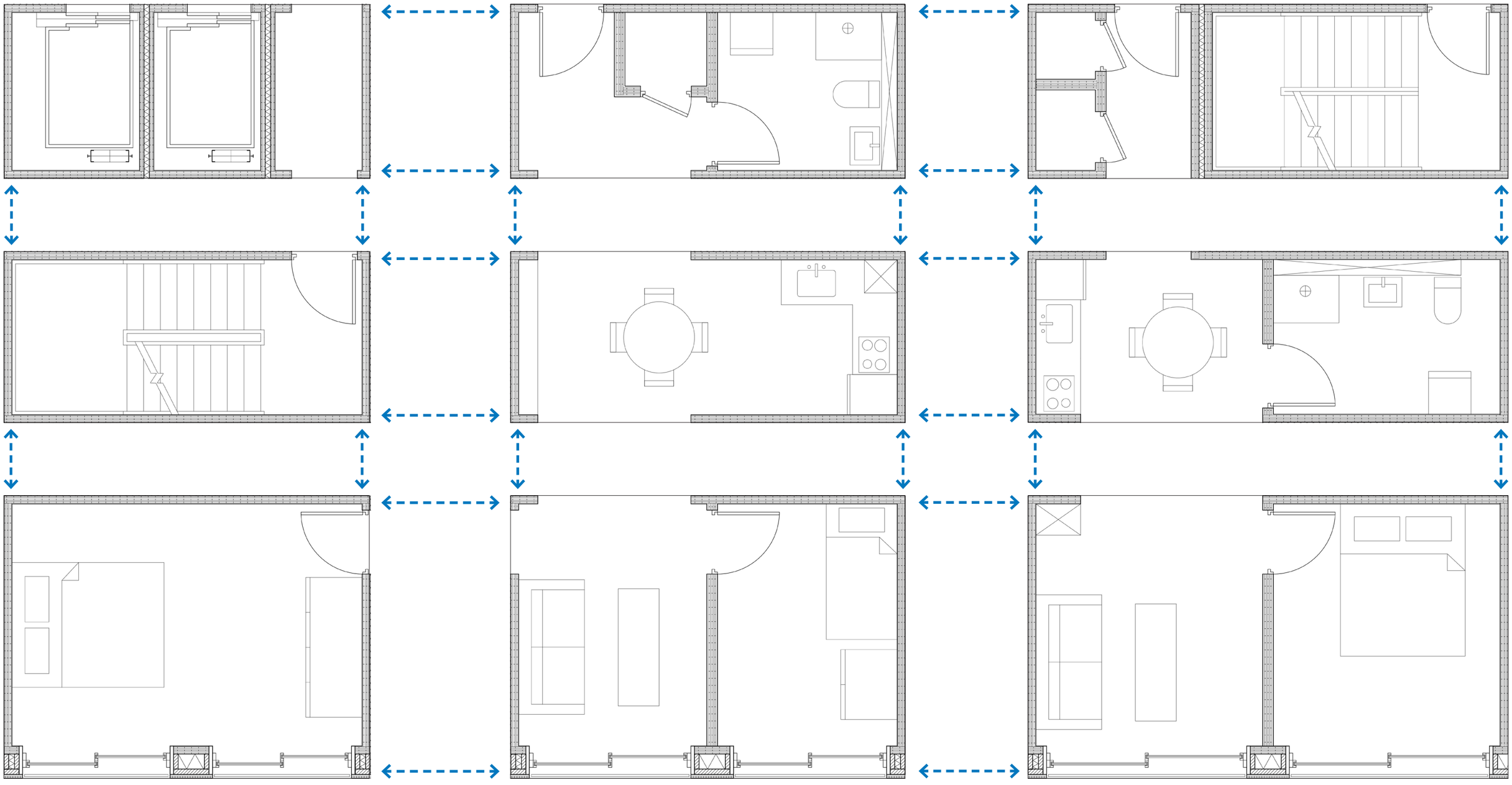
Assembly

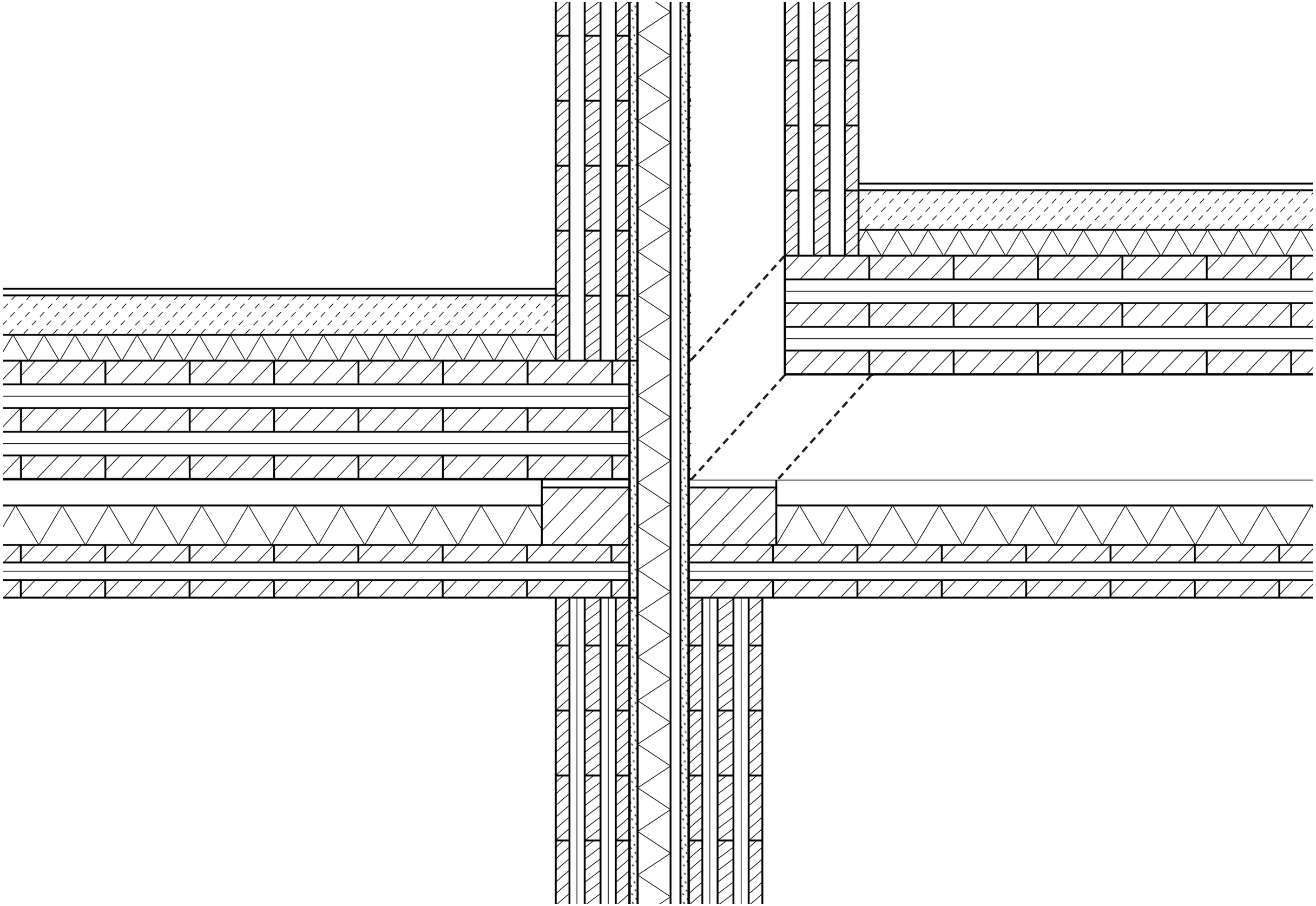


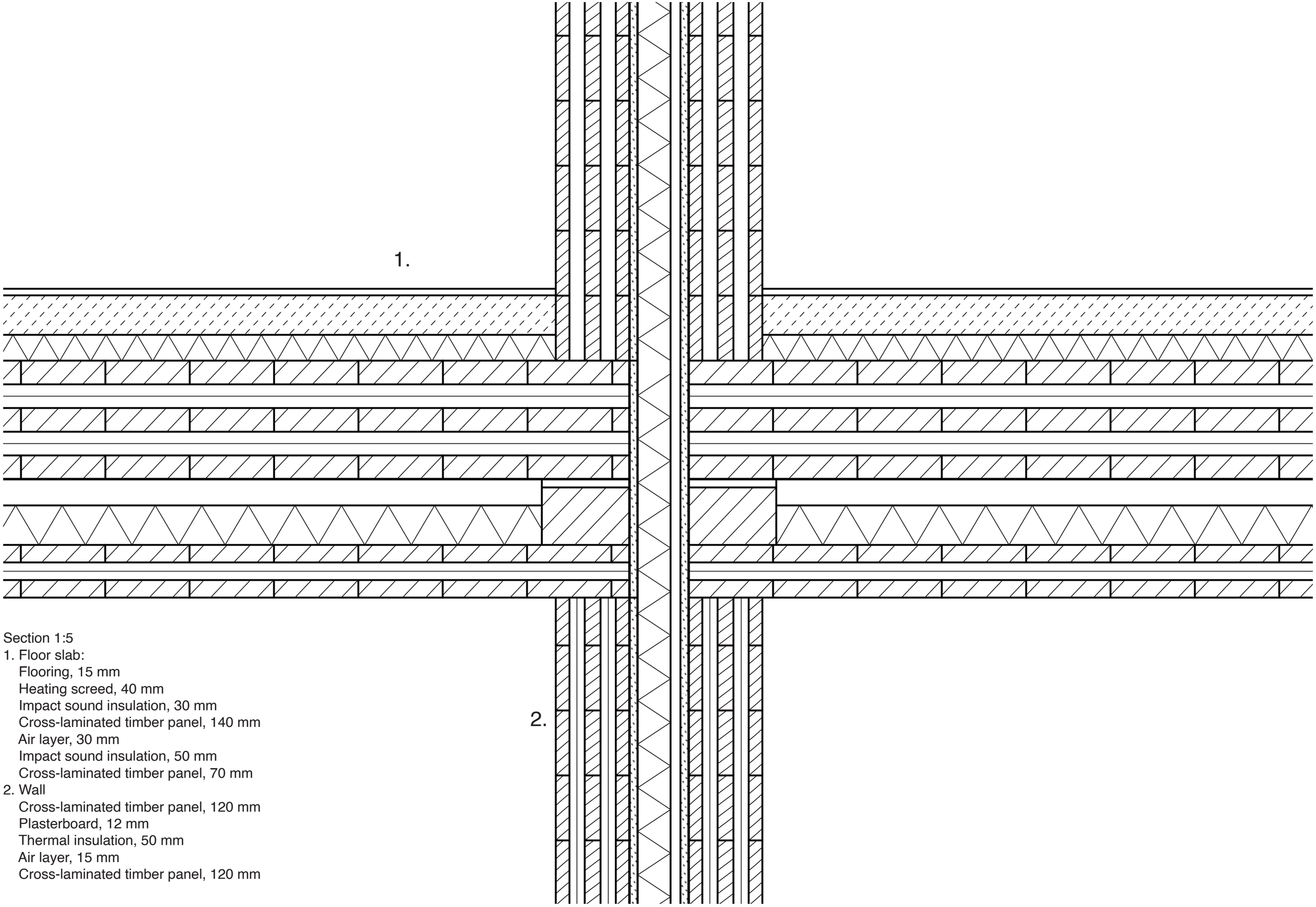
Typical Apartment

1. Foyer + Service Core
2. Kitchen + Bathroom
3. Living Room + Bedroom

One Apartment = Three Modules

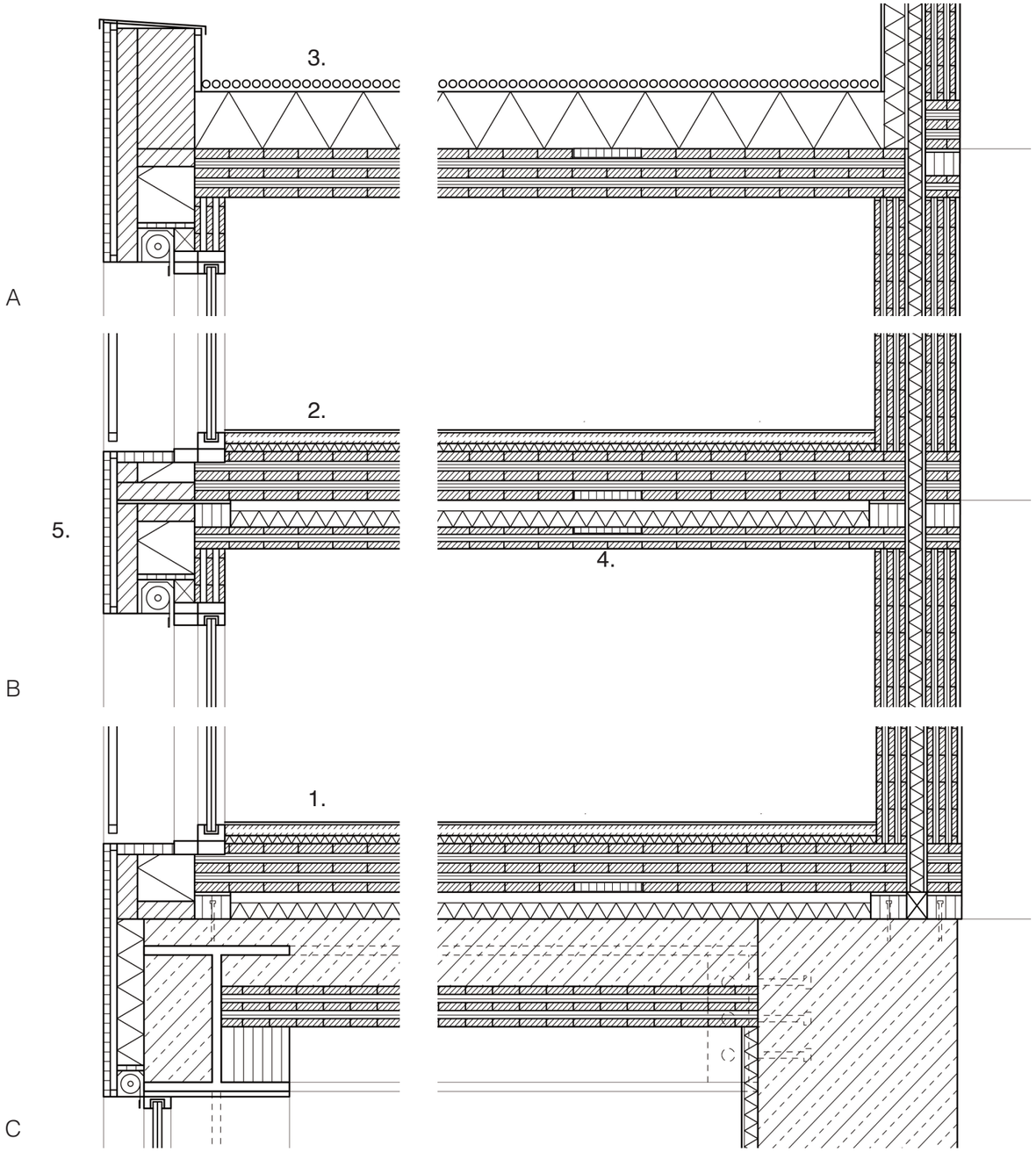


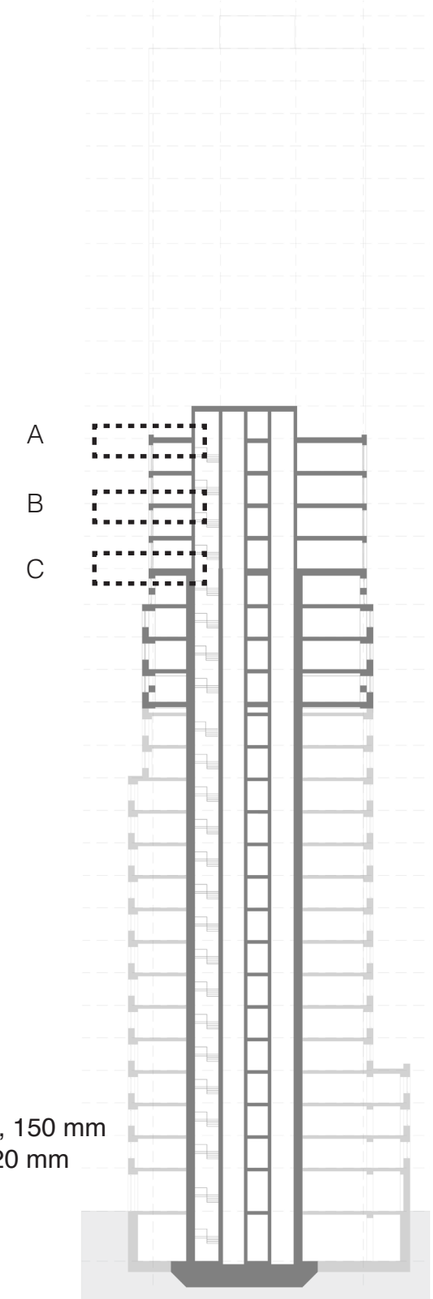




Section 1:5

1. Floor slab:
   - Flooring, 15 mm
   - Heating screed, 40 mm
   - Impact sound insulation, 30 mm
   - Cross-laminated timber panel, 140 mm
   - Air layer, 30 mm
   - Impact sound insulation, 50 mm
   - Cross-laminated timber panel, 70 mm
2. Wall
   - Cross-laminated timber panel, 120 mm
   - Plasterboard, 12 mm
   - Thermal insulation, 50 mm
   - Air layer, 15 mm
   - Cross-laminated timber panel, 120 mm





Section 1:20

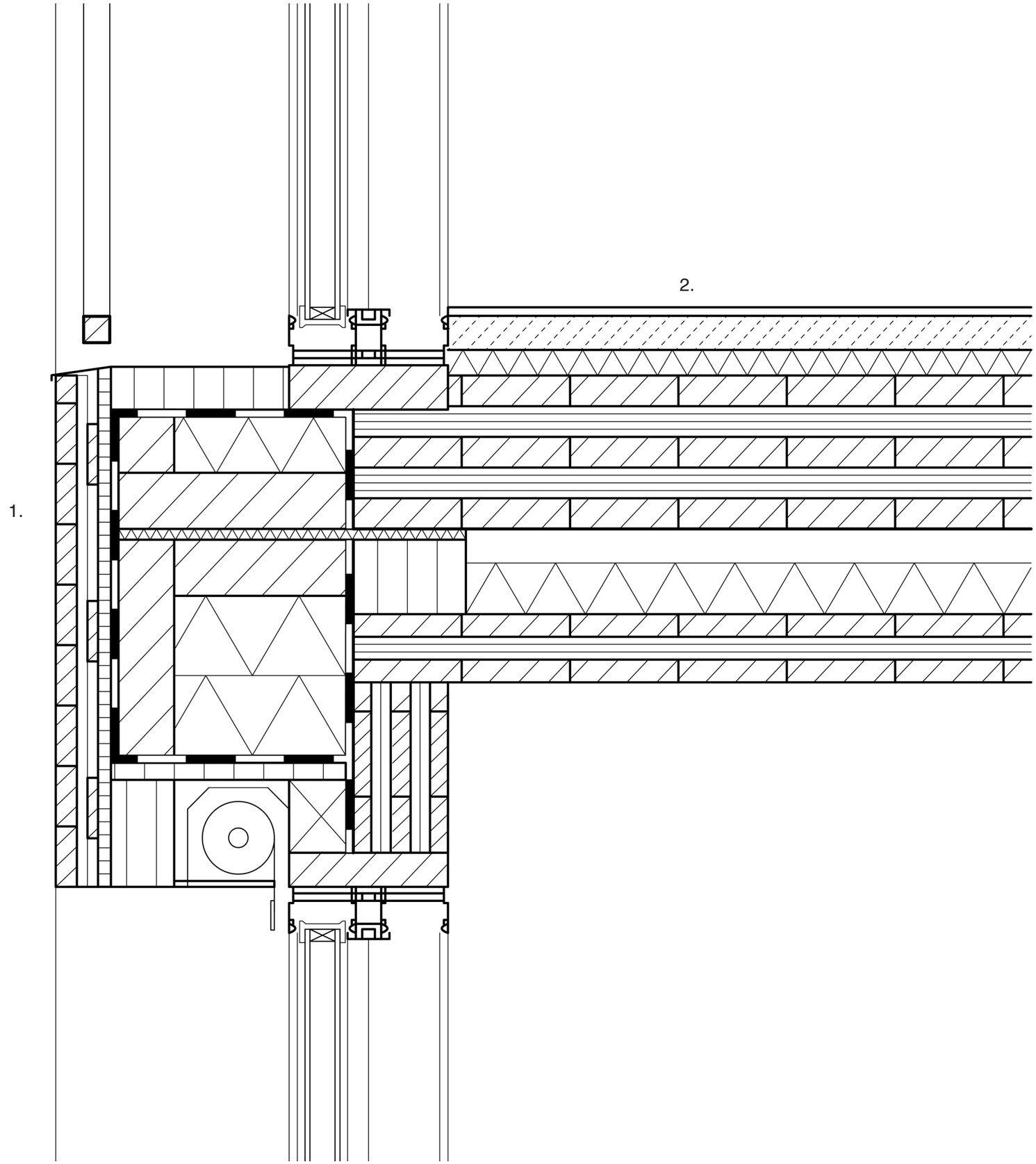
1. Floor slab:
   Flooring parquet, 15 mm
   Heating screed, 40 mm
   Impact sound insulation, 30 mm
   Cross-laminated timber panel, 140 mm
   Air layer, 30 mm
   Impact sound insulation, 50 mm
   Concrete topping, reinforced 200 mm
   Cross-laminated timber, 140 mm

2. Floor slab:
   Flooring parquet, 15 mm
   Heating screed, 40 mm
   Impact sound insulation, 30 mm
   Cross-laminated timber panel, 140 mm
   Air layer, 30 mm
   Impact sound insulation, 50 mm
   Cross-laminated timber panel, 70 mm

3. Roof:
   Gravel, 60 mm
   Waterproofing bitumen, 11 mm
   Thermal insulation, 200 mm
   Cross-laminated timber panel, 140 mm

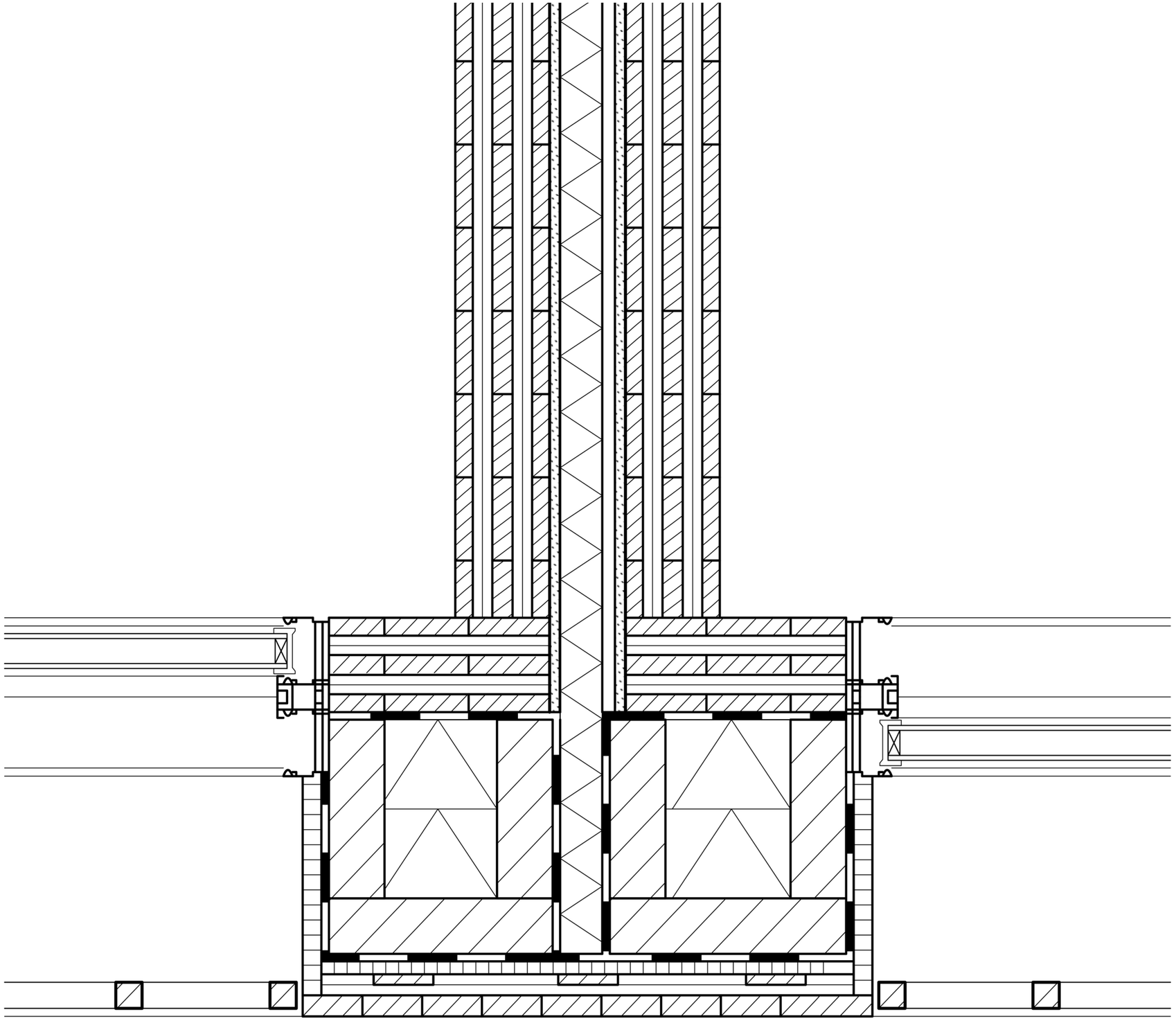
4. Panel Joining with fish plate, three- layer panel with four rows of screws 27/160 mm

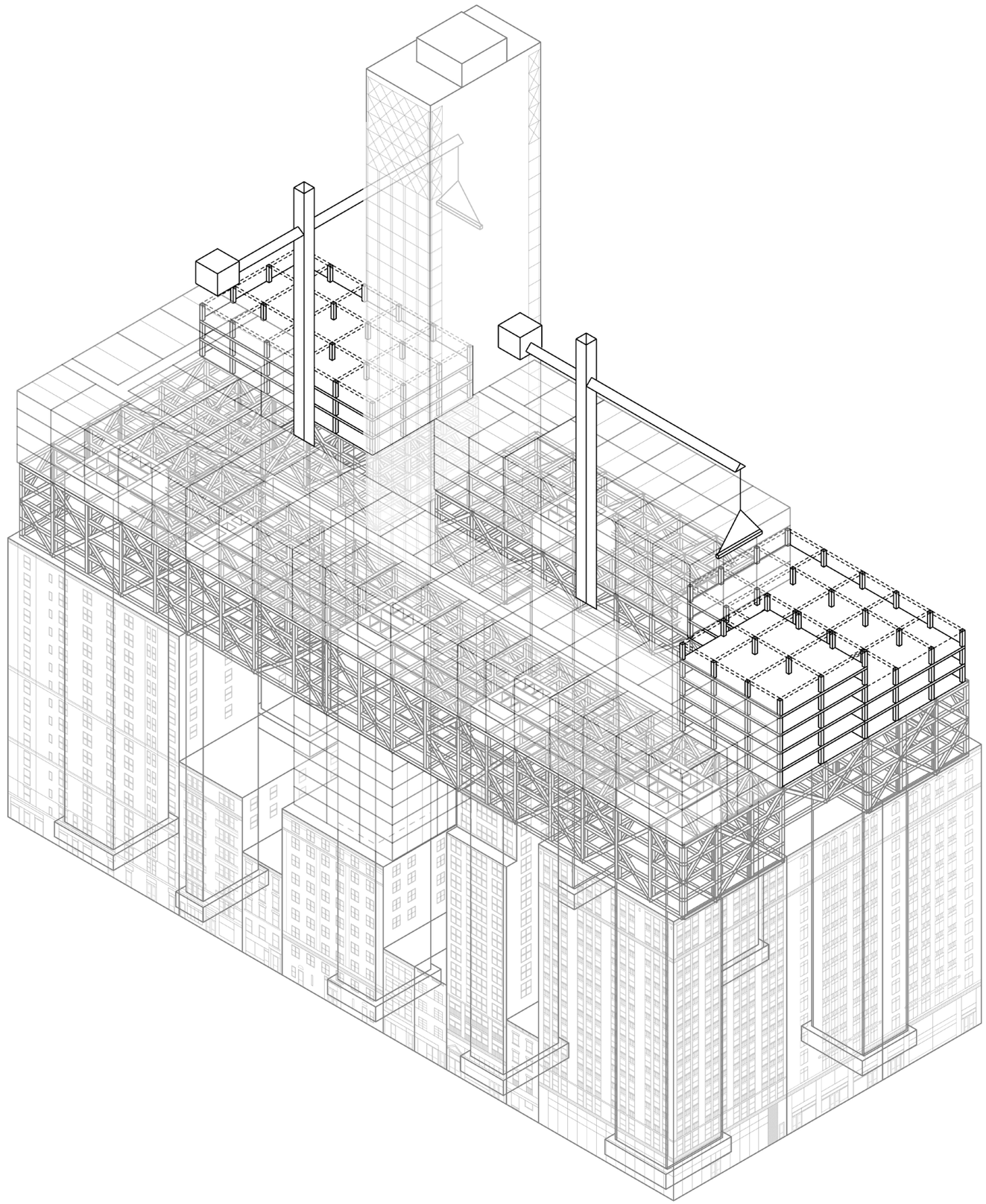
5. Wall
   Spruce, painted larch, 25 mm
   Wooden substructure 20 mm
   Wooden studs/thermal insulation, 150 mm
   Cross-laminated timber panel, 120 mm



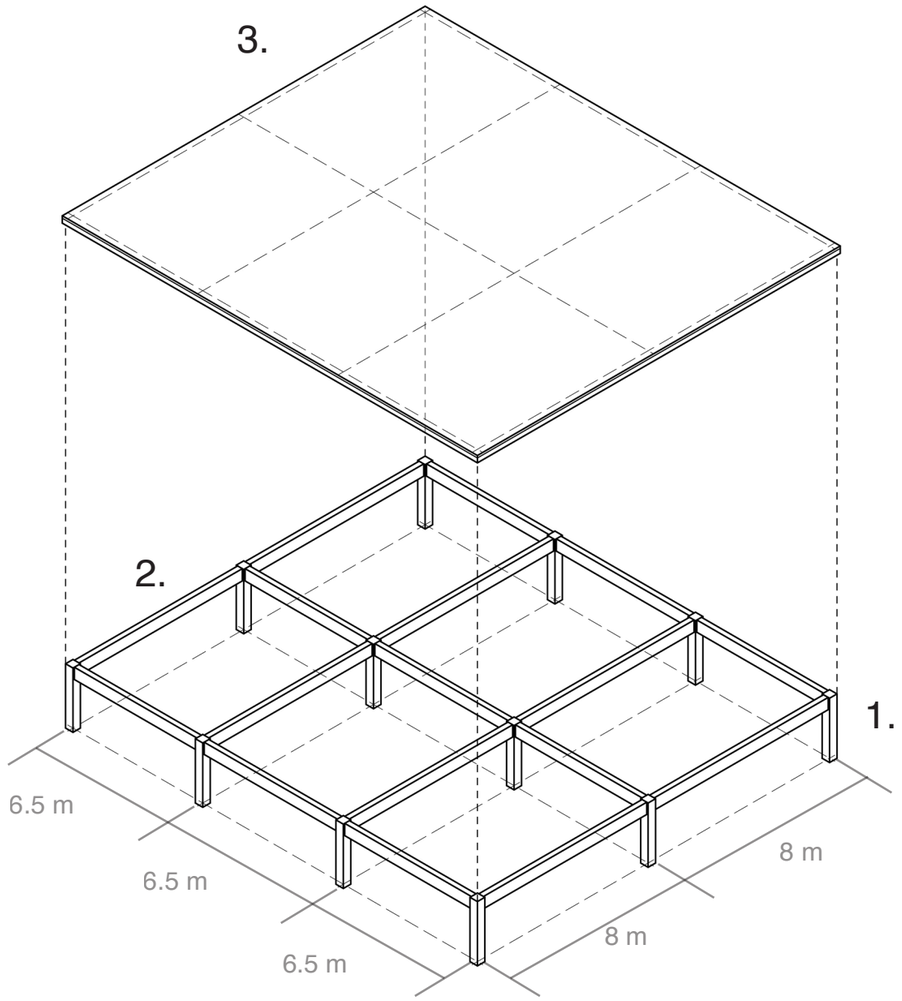
Section 1:5

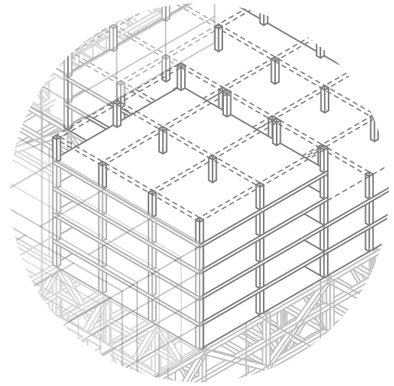
1. Wall:
   Spruce, painted larch, 25 mm
   Wooden substructure 20 mm
   Wind paper
   Wooden studs/thermal insulation, 150 mm
   Vapour barrier
   Cross-laminated timber panel, 120 mm
2. Floor slab
Flooring parquet, 15 mm
   Heating screed, 40 mm
   Impact sound insulation, 30 mm
   Cross-laminated timber panel, 140 mm
   Air layer, 30 mm
   Impact sound insulation, 50 mm
   Cross-laminated timber panel, 70 mm





9. Addition of Timber Rigid Frame

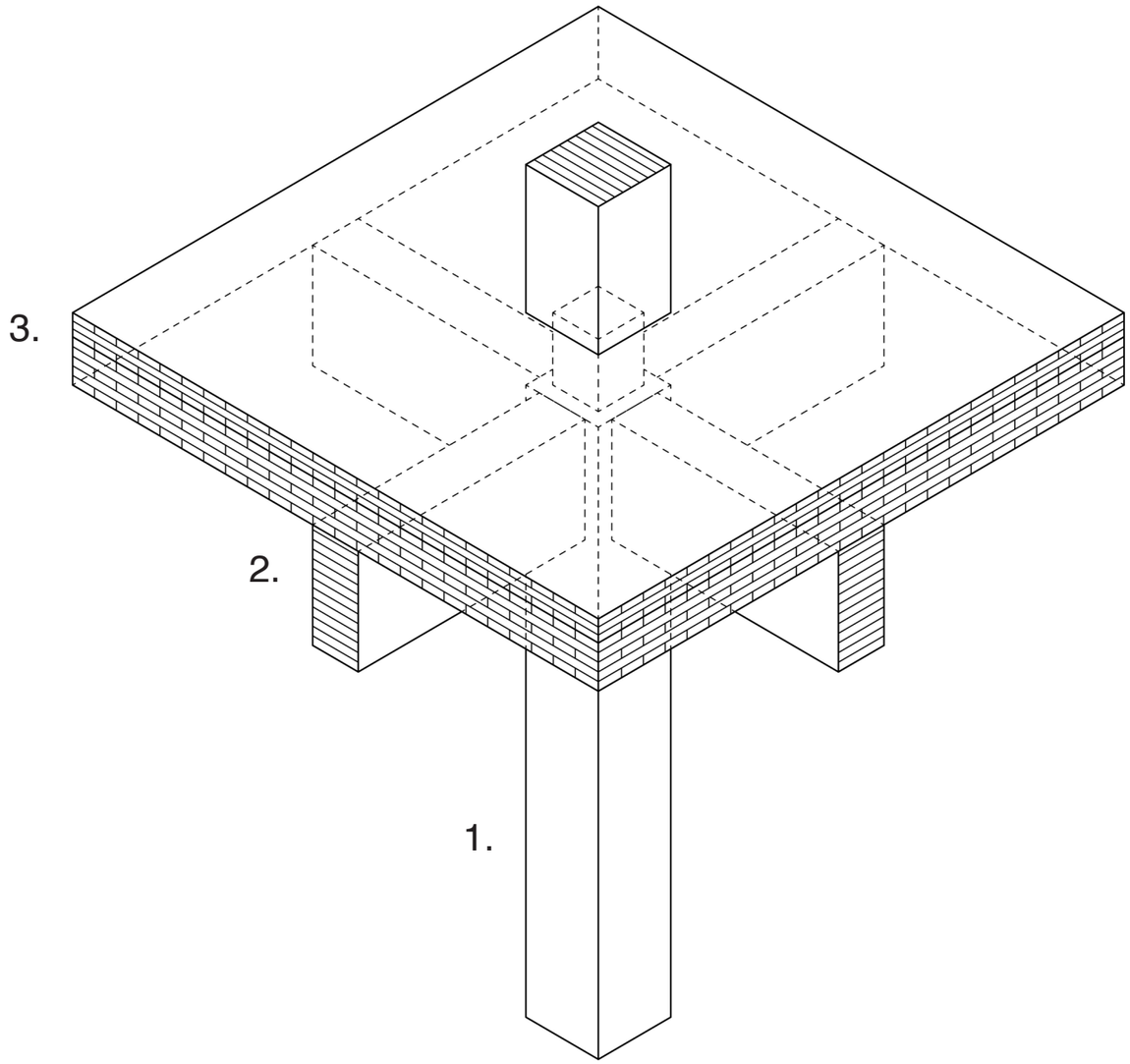




Example: Department Store

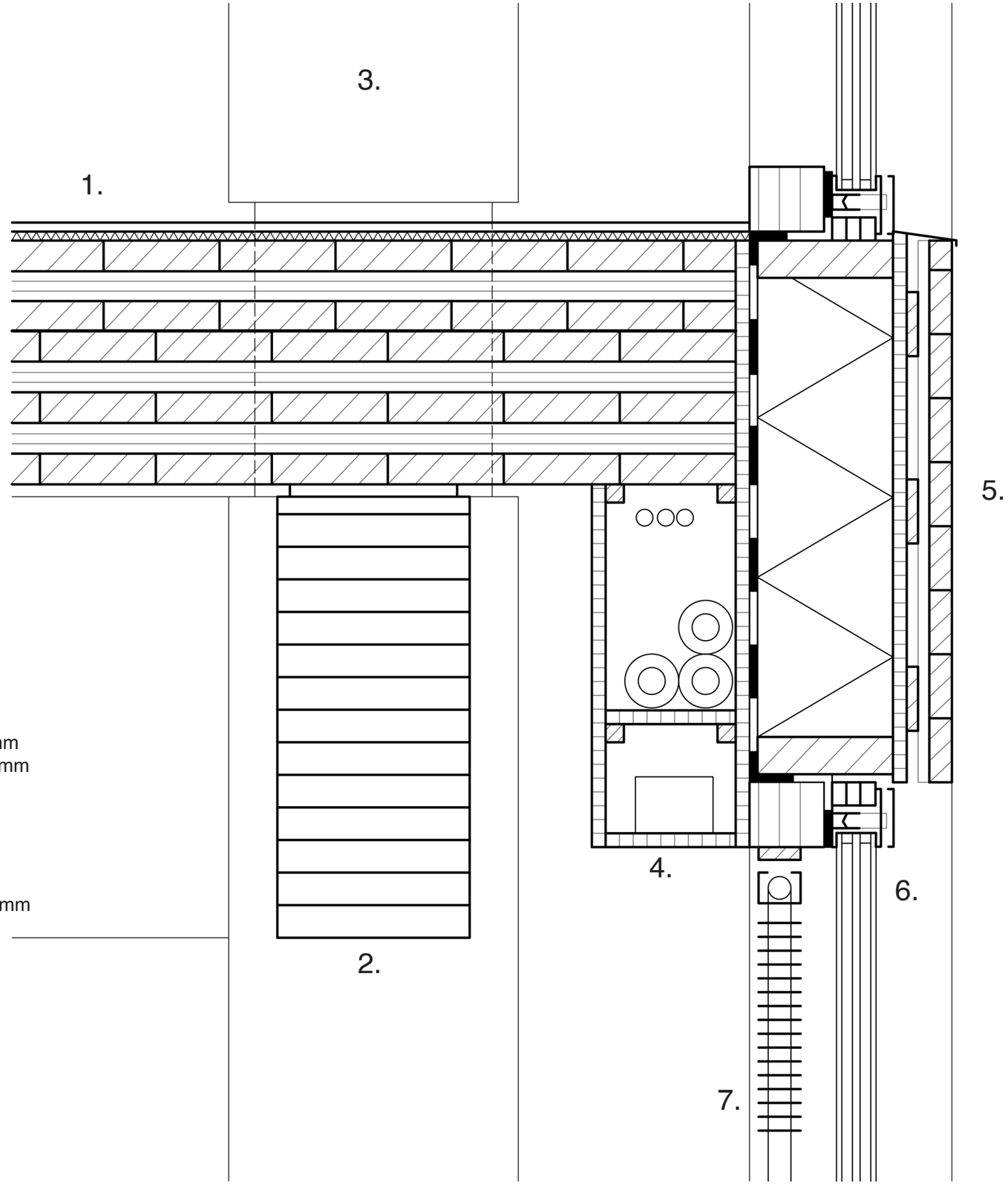
Prefabricated elements

1. Column: glued laminated timber, 320/320 mm
2. Beams: glued laminated timber, 220/500 mm
3. Slab:
   Cross-laminated timber panel (3-layers), 99 mm
   Cross-laminated timber panel (5-layers), 169 mm



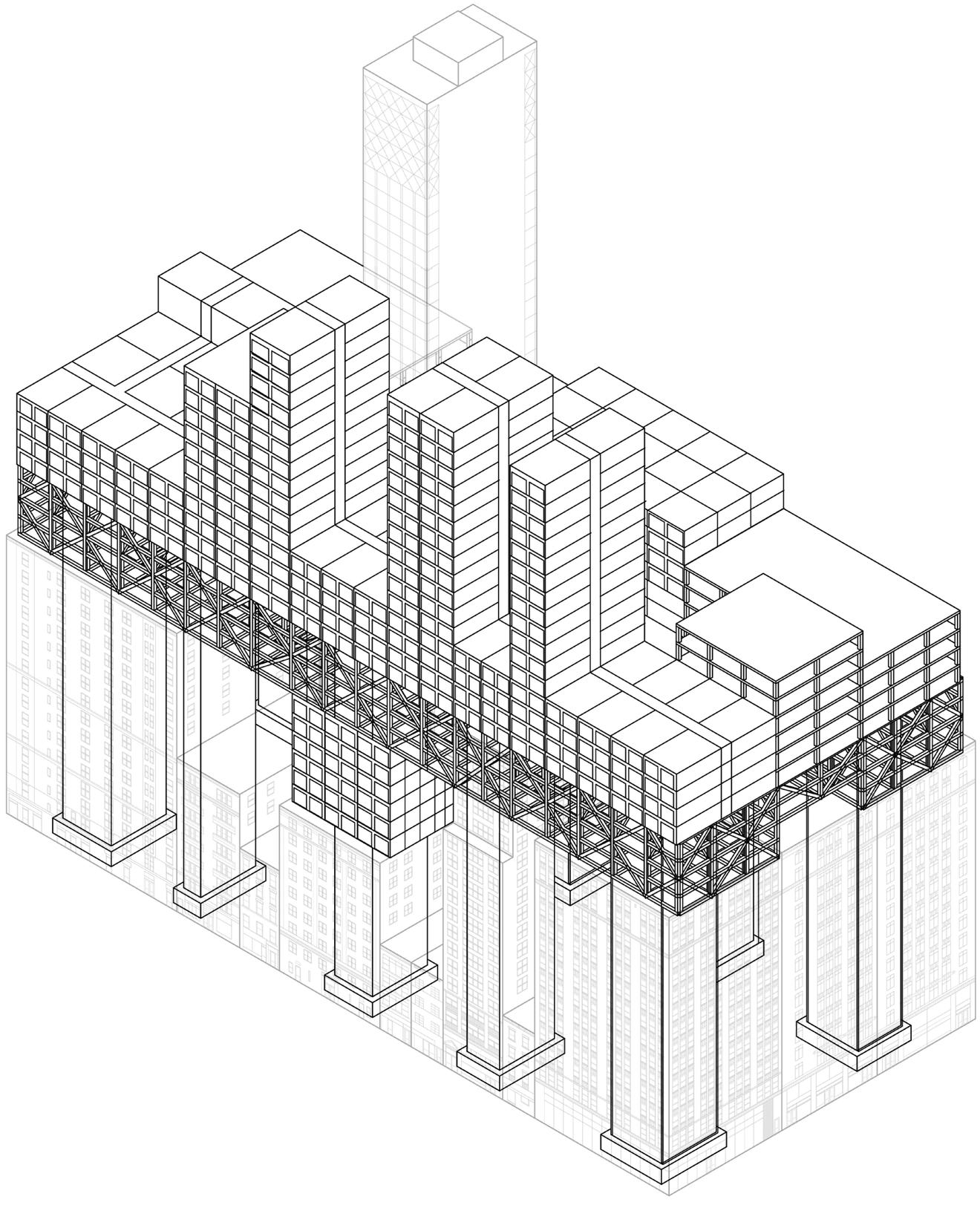
Prefabricated elements

1. Column: glued laminated timber, 320/320 mm
2. Beams: glued laminated timber, 220/500 mm
3. Slab:
   Cross-laminated timber panel (3-layers), 99 mm
   Cross-laminated timber panel (5-layers), 169 mm

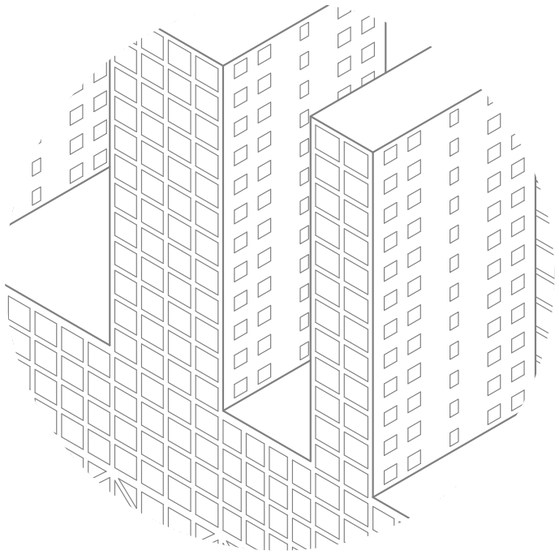


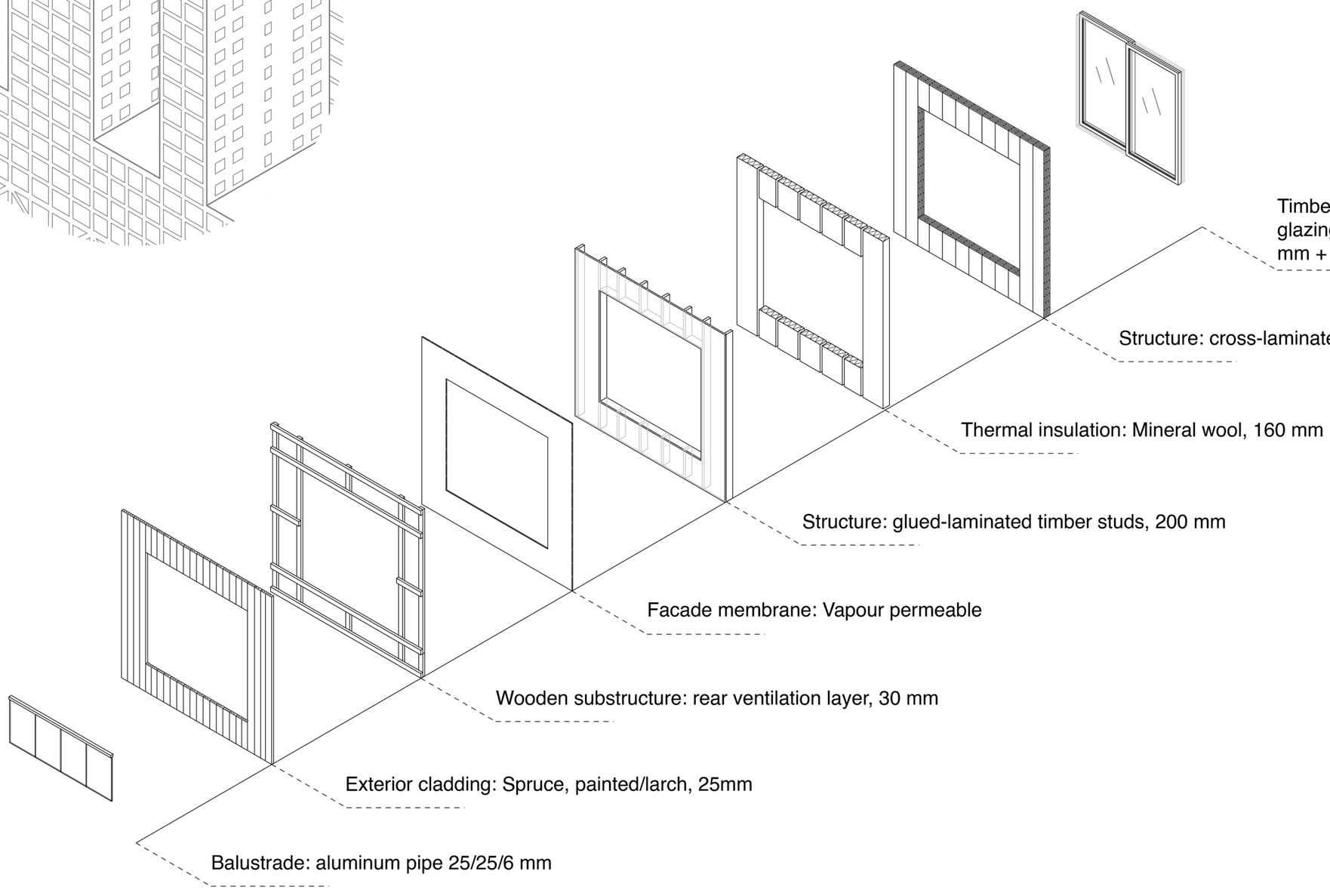
Section 1:5

1. Floor slab:
   Flooring carpet, 9 mm
   Impact sound insulation, 10 mm
   Cross-laminated timber panel (3-layers), 99 mm
   Cross-laminated timber panel (5-layers), 169 mm
2. Beams, glued laminated timber, 220/500 mm
3. Column, glued laminated timber, 320/320 mm
4. Heating and utilities conduit
5. Wall
   Timber boarding, cedar, heat-treated, 30 mm
   Substructure, plywood strip, weatherproof 13 mm
   Wood fibreboard, 13 mm
   Thermal insulation, 200 mm
   Timber strip (vapour barrier), 10 mm
   Wood fibreboard, 13 mm
6. Glazing
   Wood and aluminum with triple glazing
7. Glare protection: timber slats (horizontal)

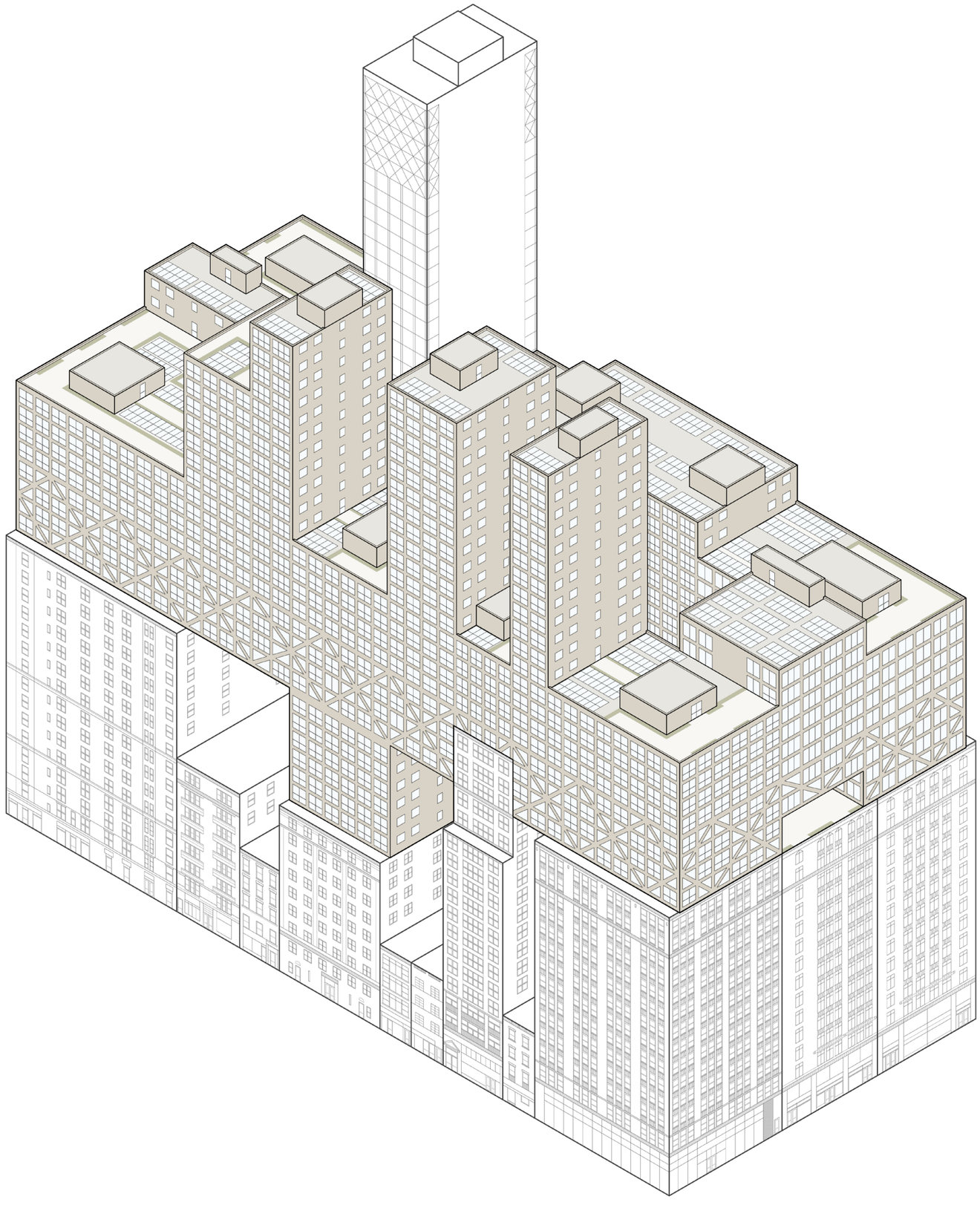


10. Overall Structural Assembly





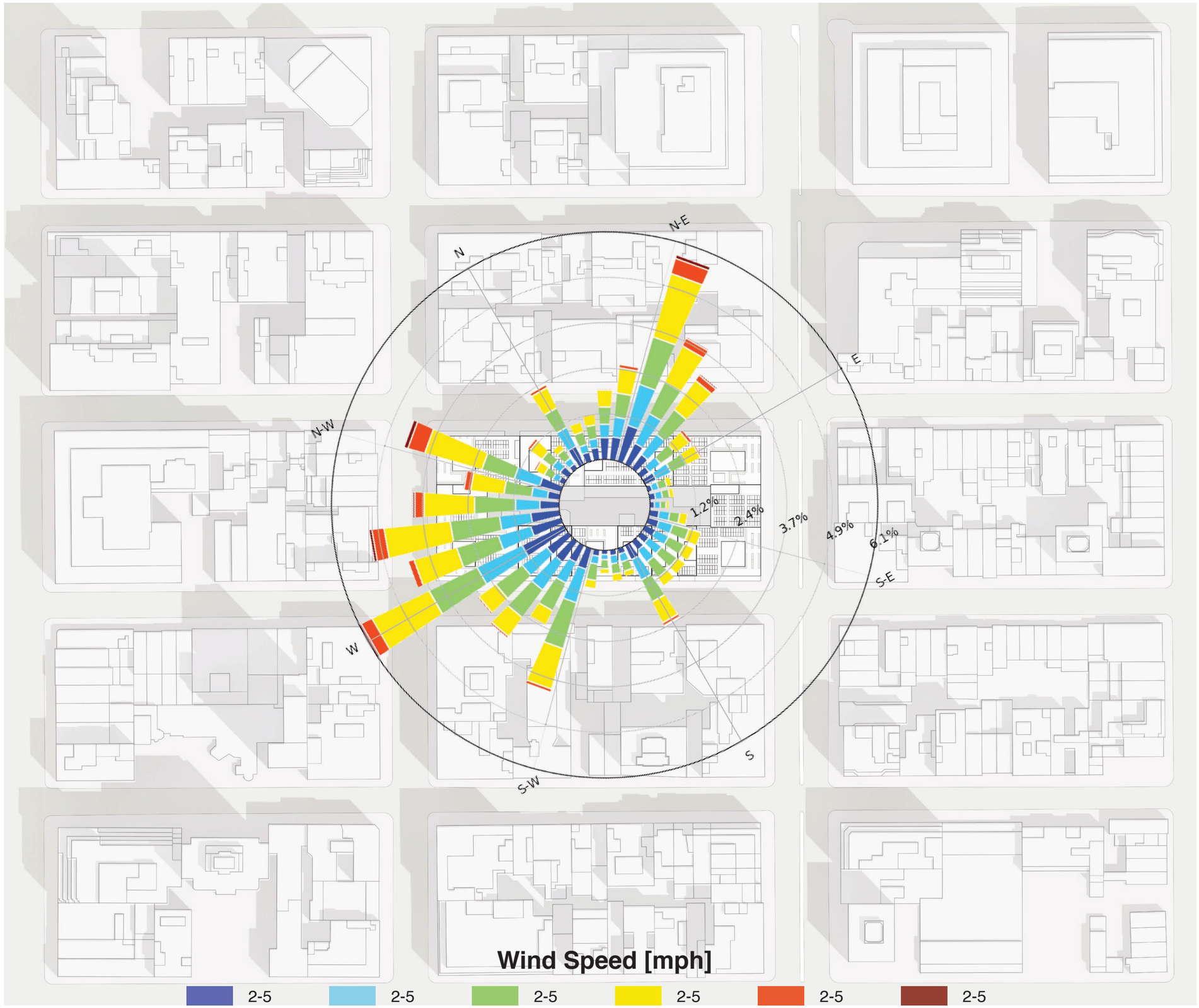
11. Facade Make-Up



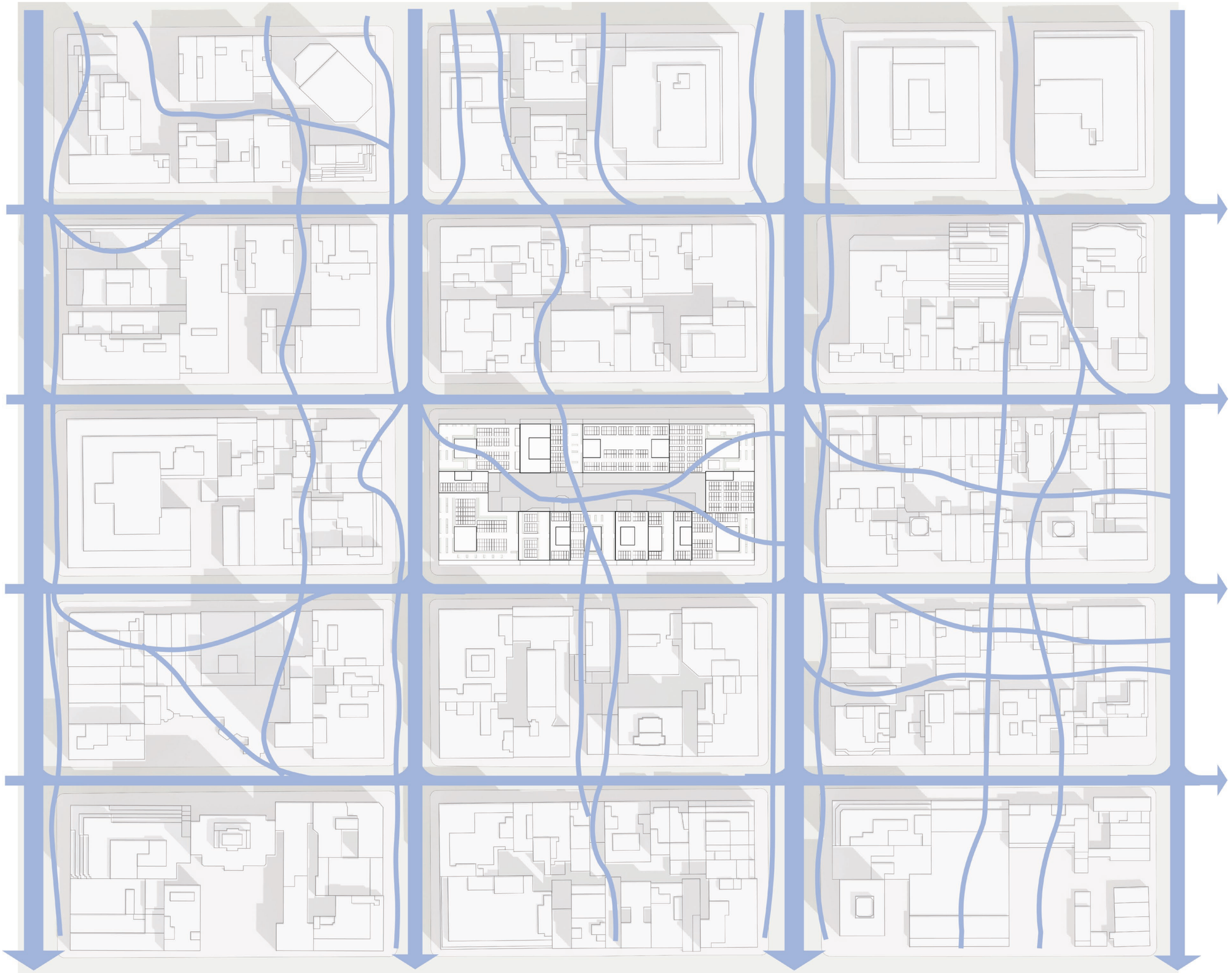
12. Result

Climate.

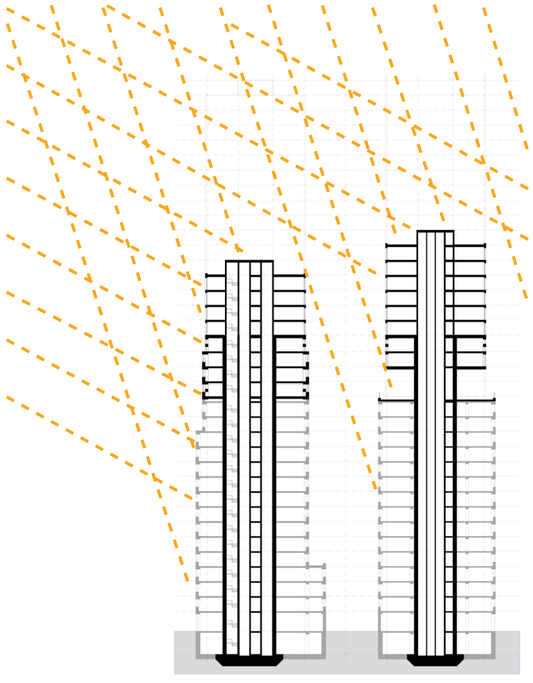
Windrose Plot



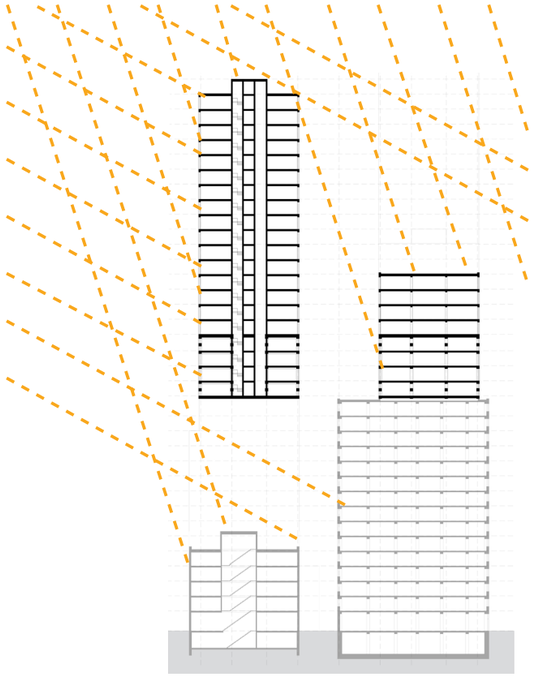
Wind Directions



Sunlight

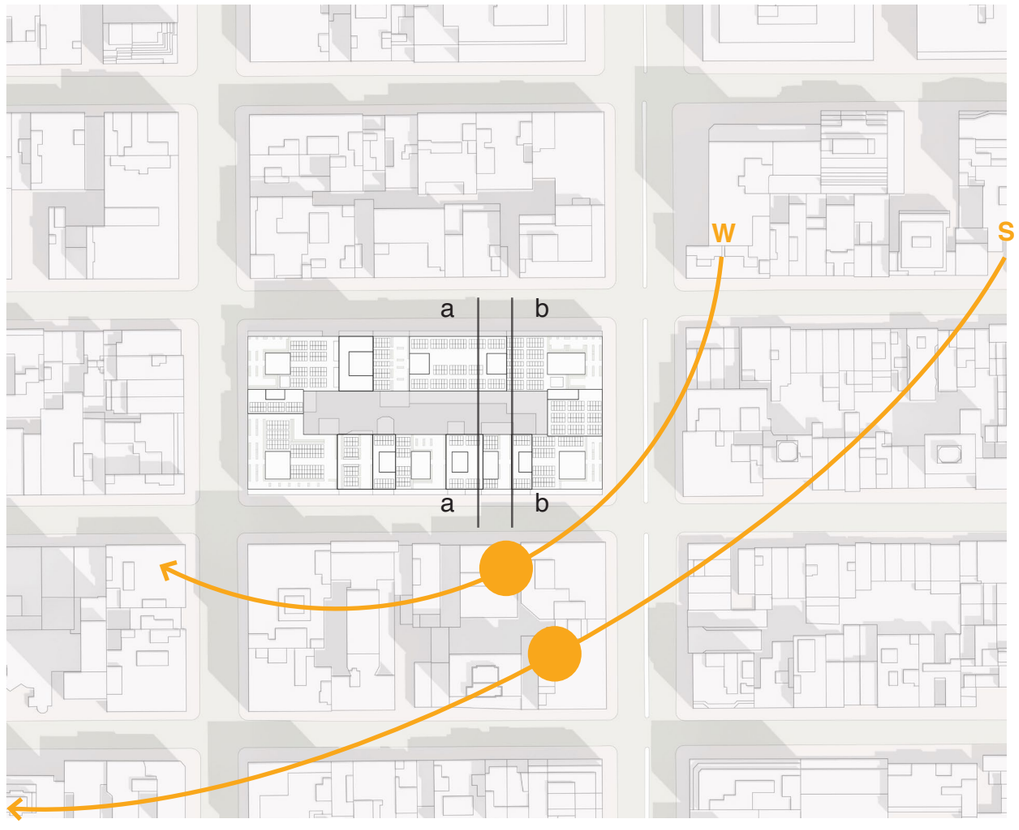


aa



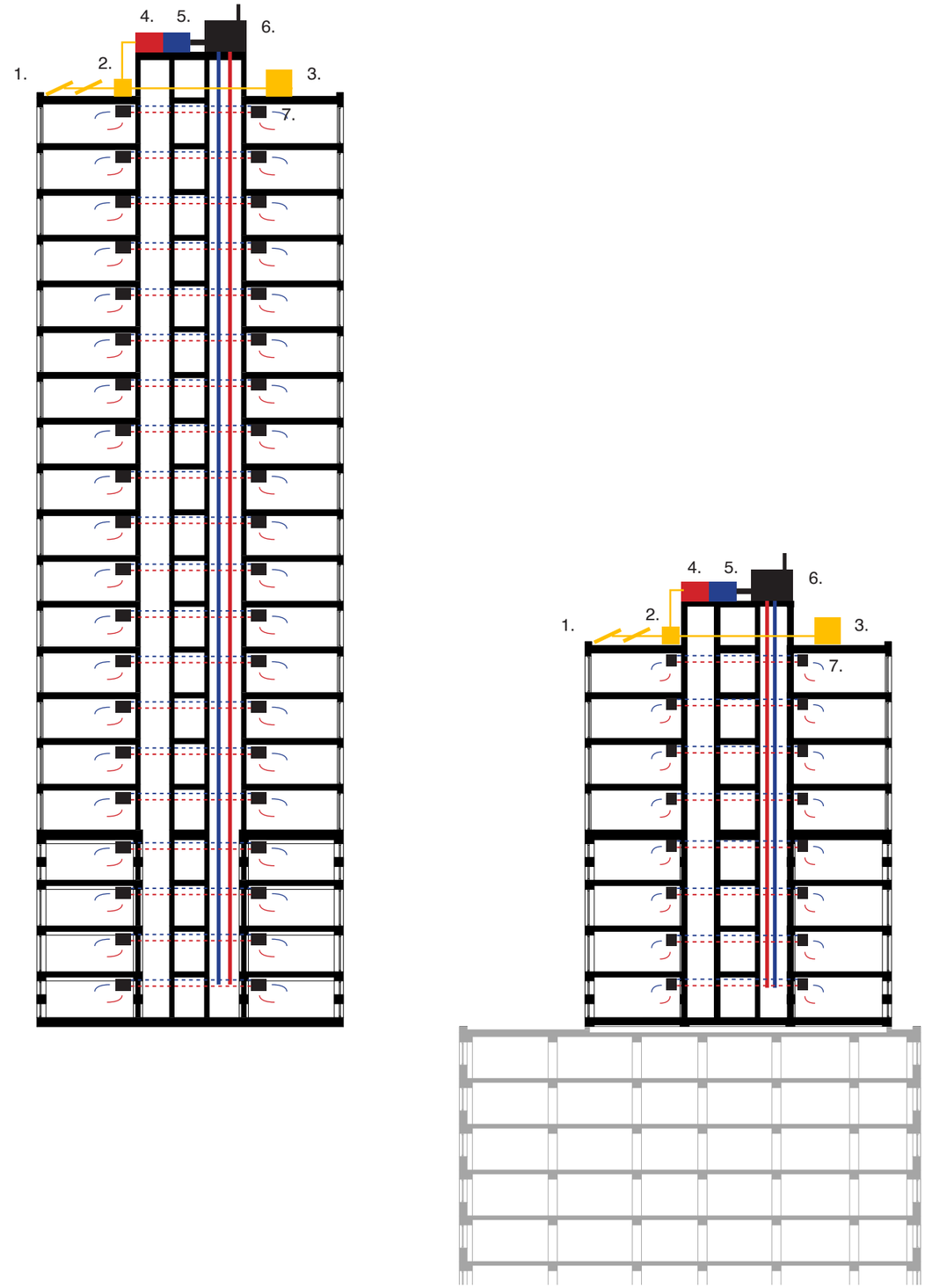
bb

Sun Penetration



Location of Solar Panels

Mechanical System

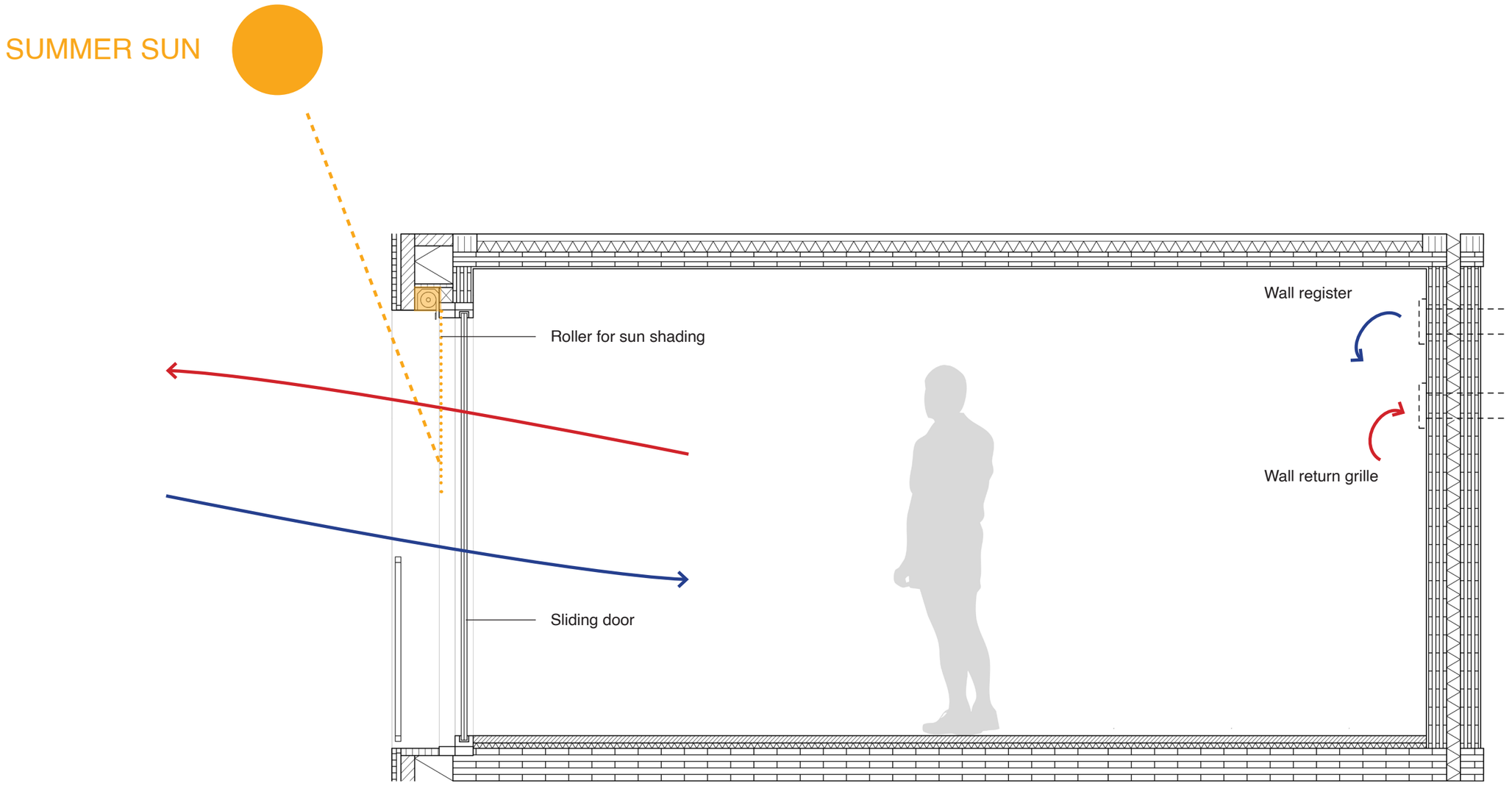


1. Solar PV Panels
2. Controller
3. Electricity Storage

4. Boiler
5. Chilled Water Plant
6. Fan Room
7. VAV Terminals (in each compartment)

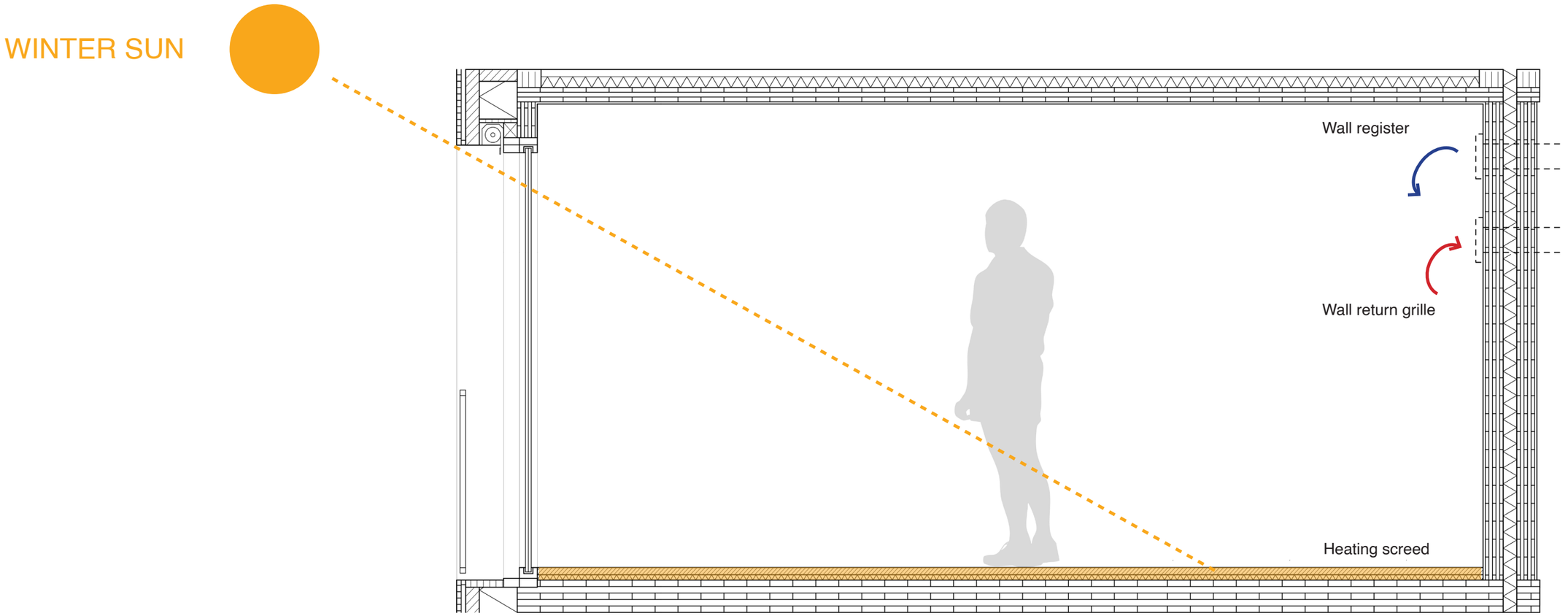
Central All-Air System: Variable Air Volume

Summer



Cooling by natural ventilation & central all-air system

Winter



Heating by direct gain solar gain and underfloor

Building Fragment

Madison Avenue

Park Avenue

31st Street



30th Street

Selected Building Fragment (Plan)

Closet

Lobby

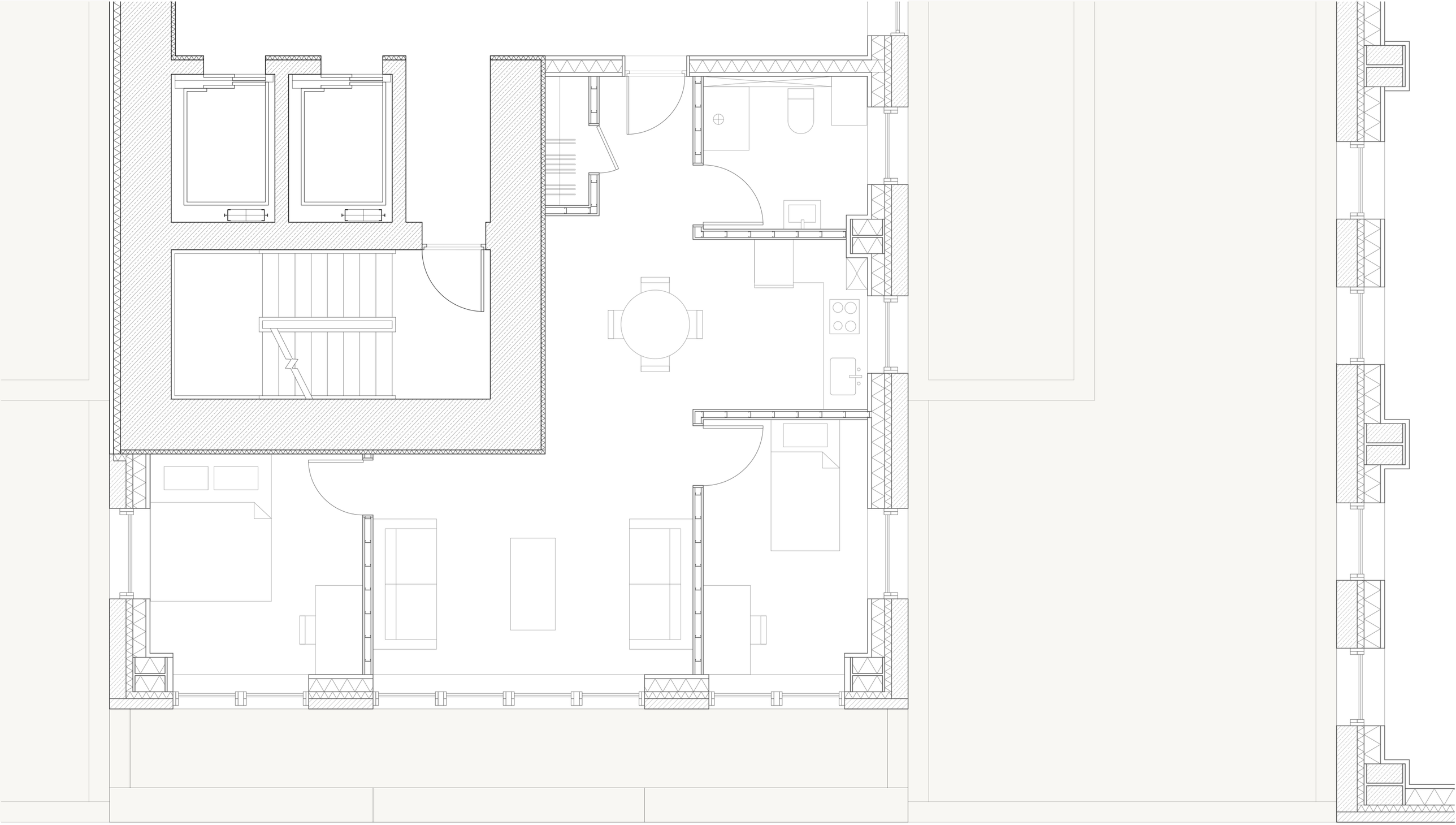
Space for rent

Vestibule

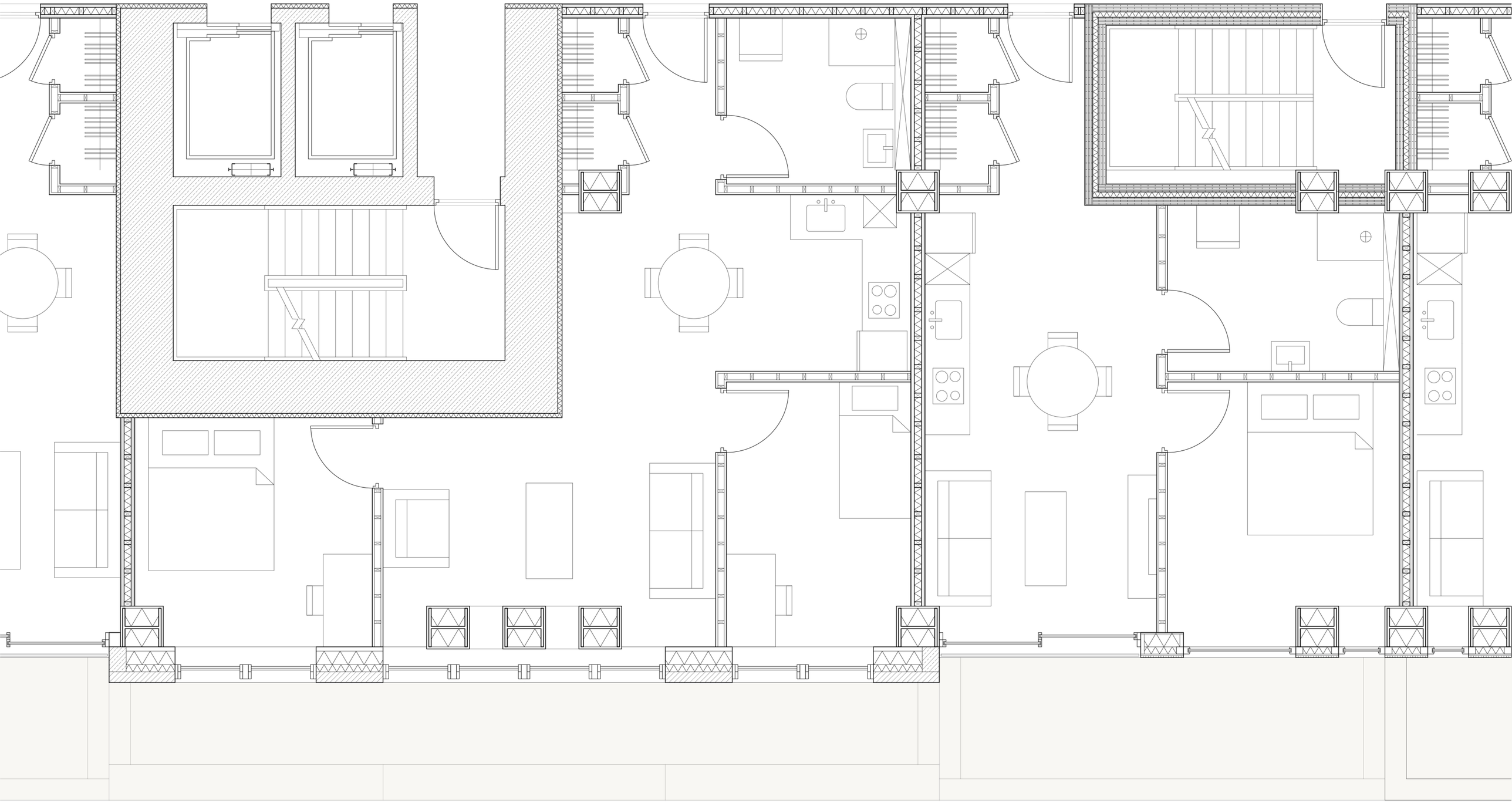
Animal Clinic

30th Street

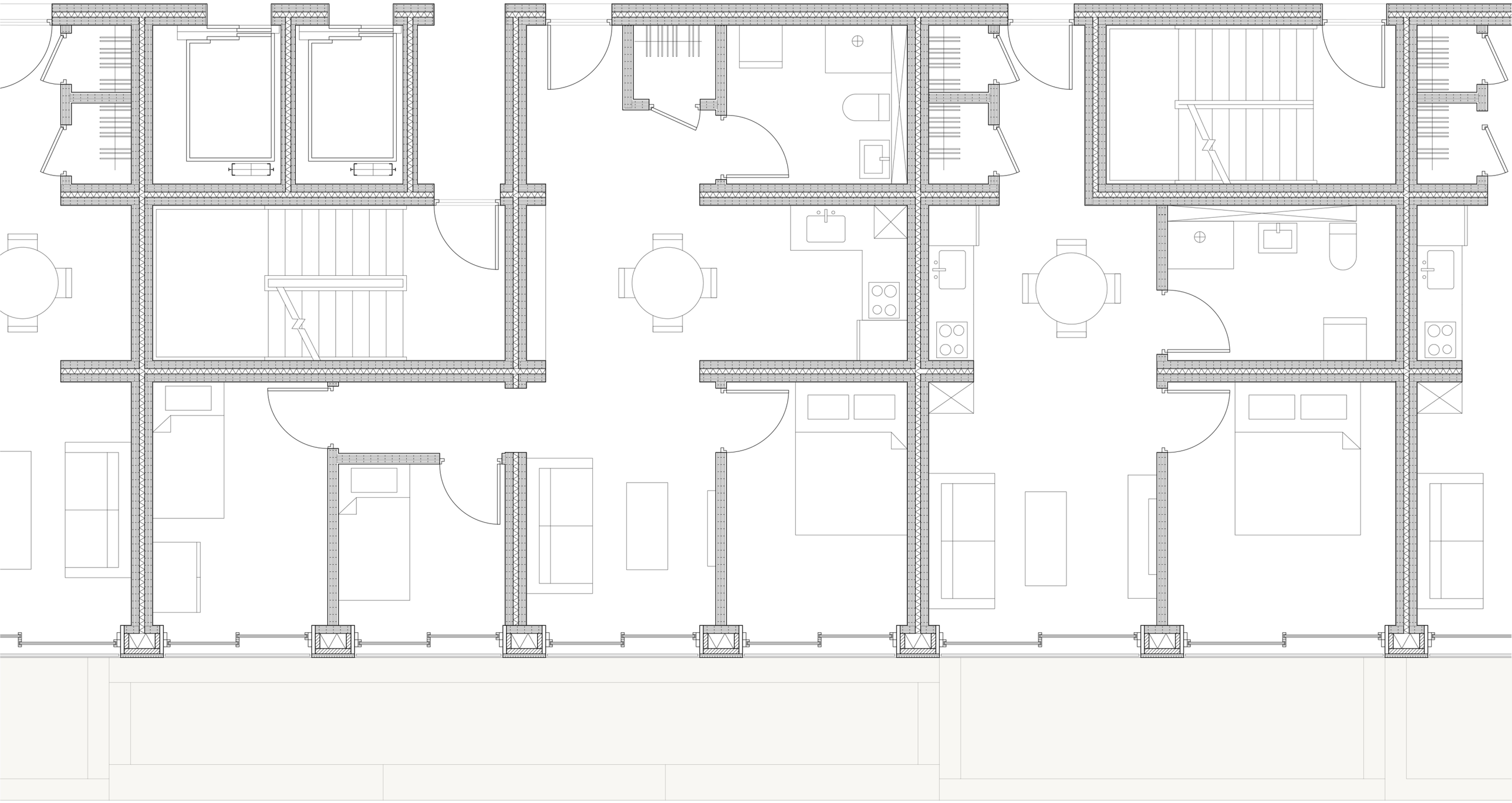
Ground Level I 1:50



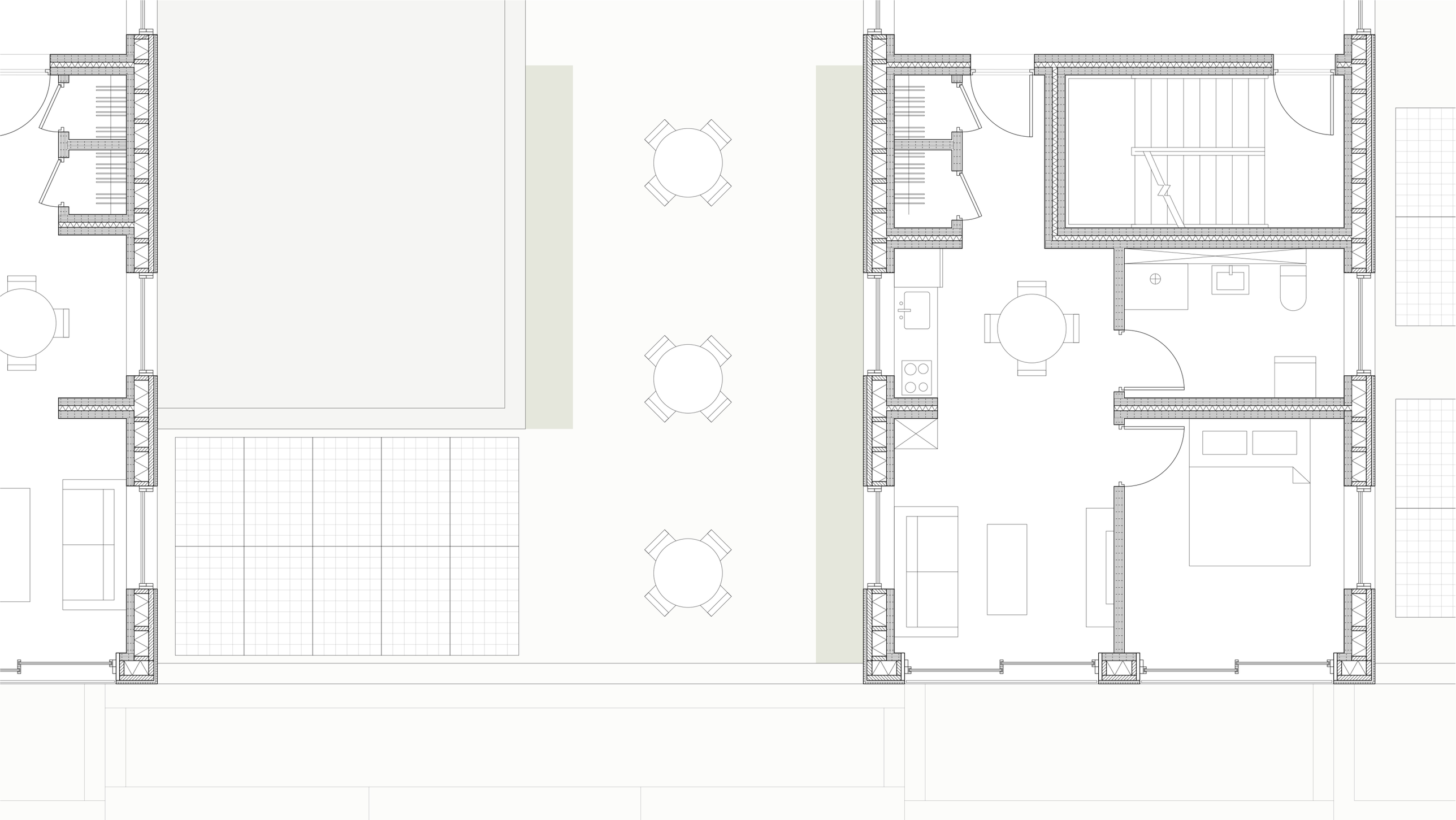
Level 10 (existing buildings) l 1:50



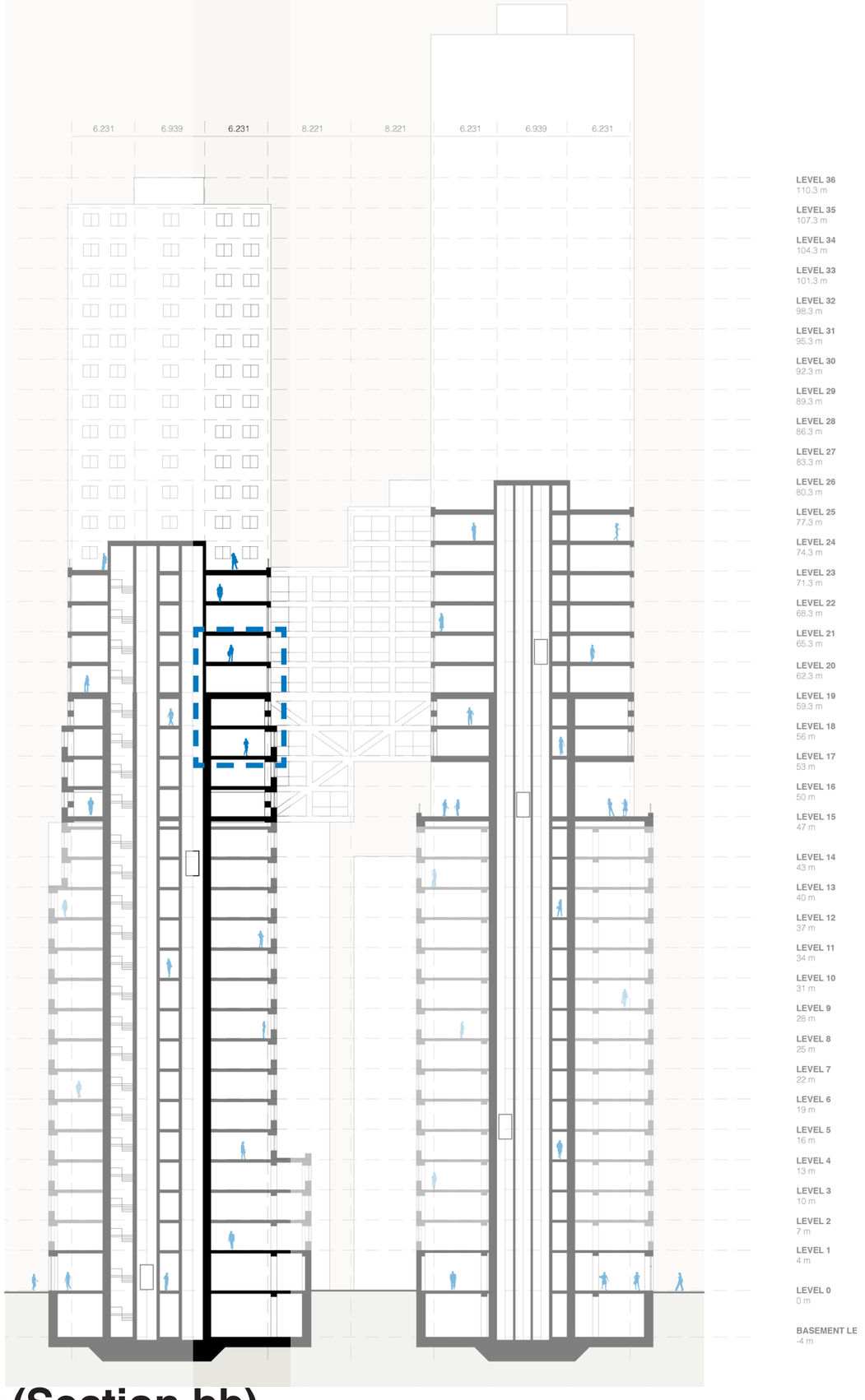
Level 15 (steel truss level)l 1:50



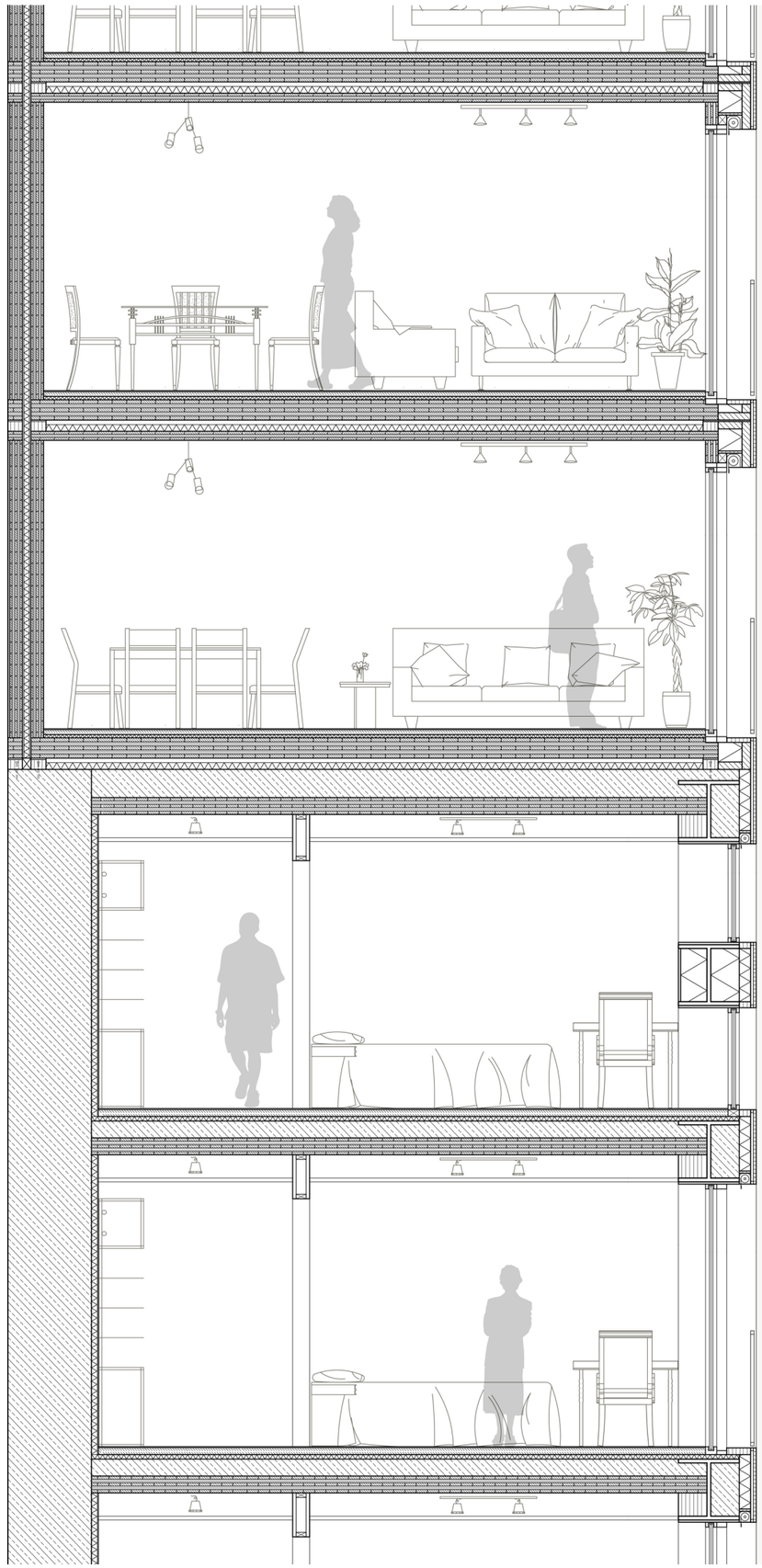
Level 20 l 1:50



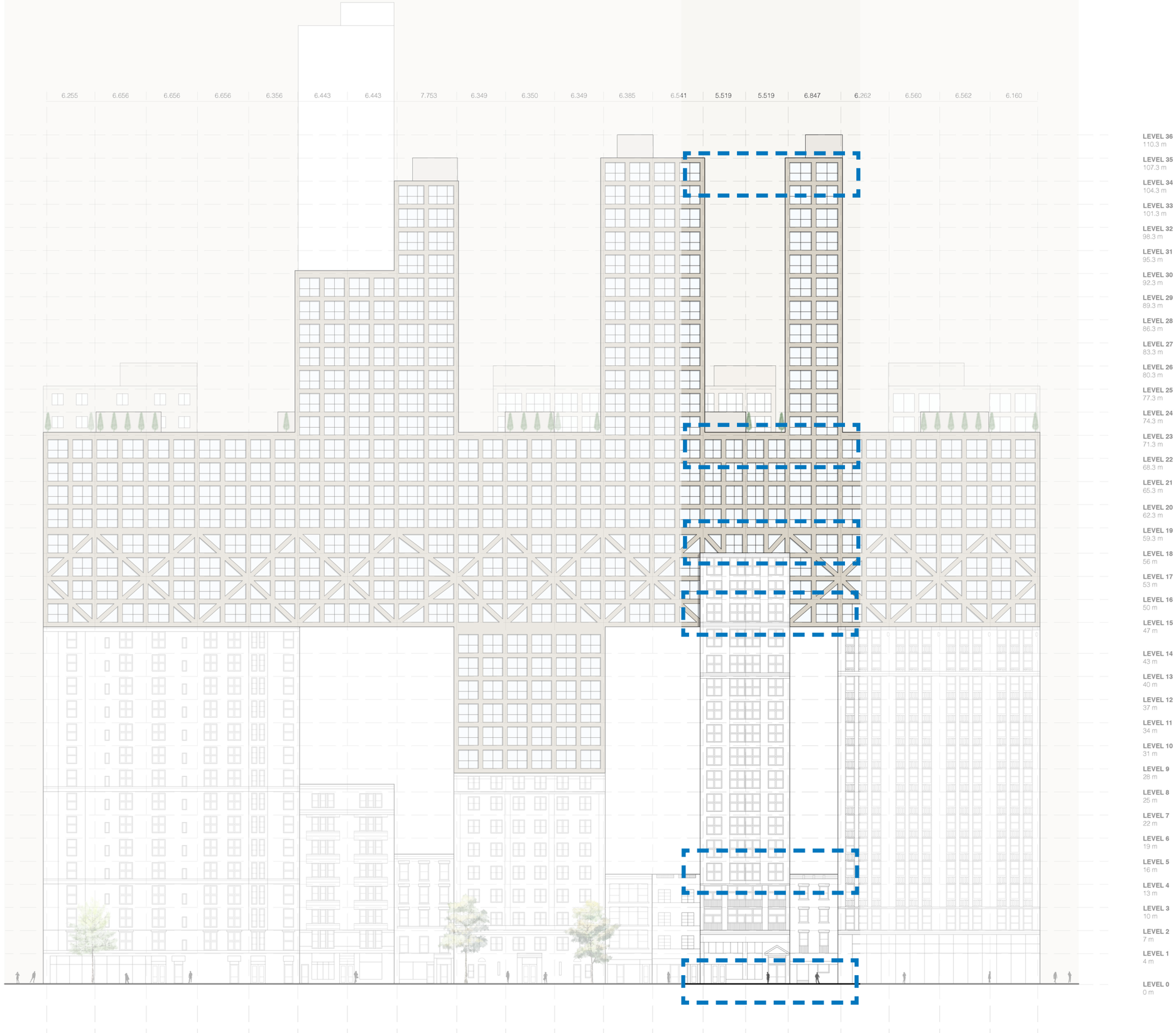
Level 30 l 1:50



Selected Building Fragment (Section bb)



Section bb l 1:50



Selected Building Fragment (Elevation)



Elevation (lower buildings) l 1:50



Elevation (lower buildings + truss levels + modular units levels) l 1:50

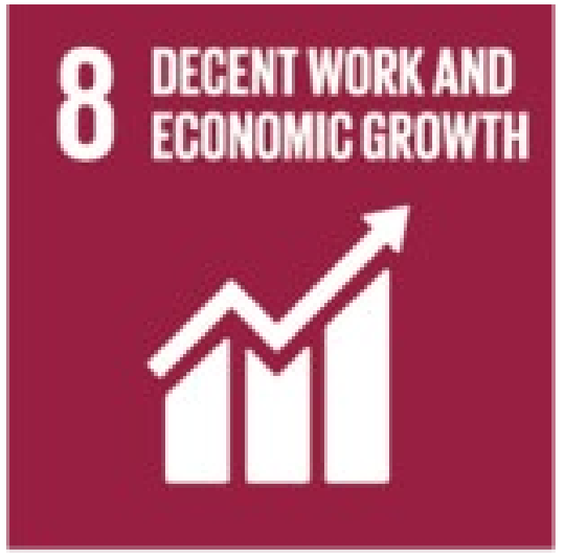


Elevation (modular units levels) l 1:50

Sustainability & Beyond.

UN Sustainable Development Goals











“Ensuring good quality of dwelling spaces”

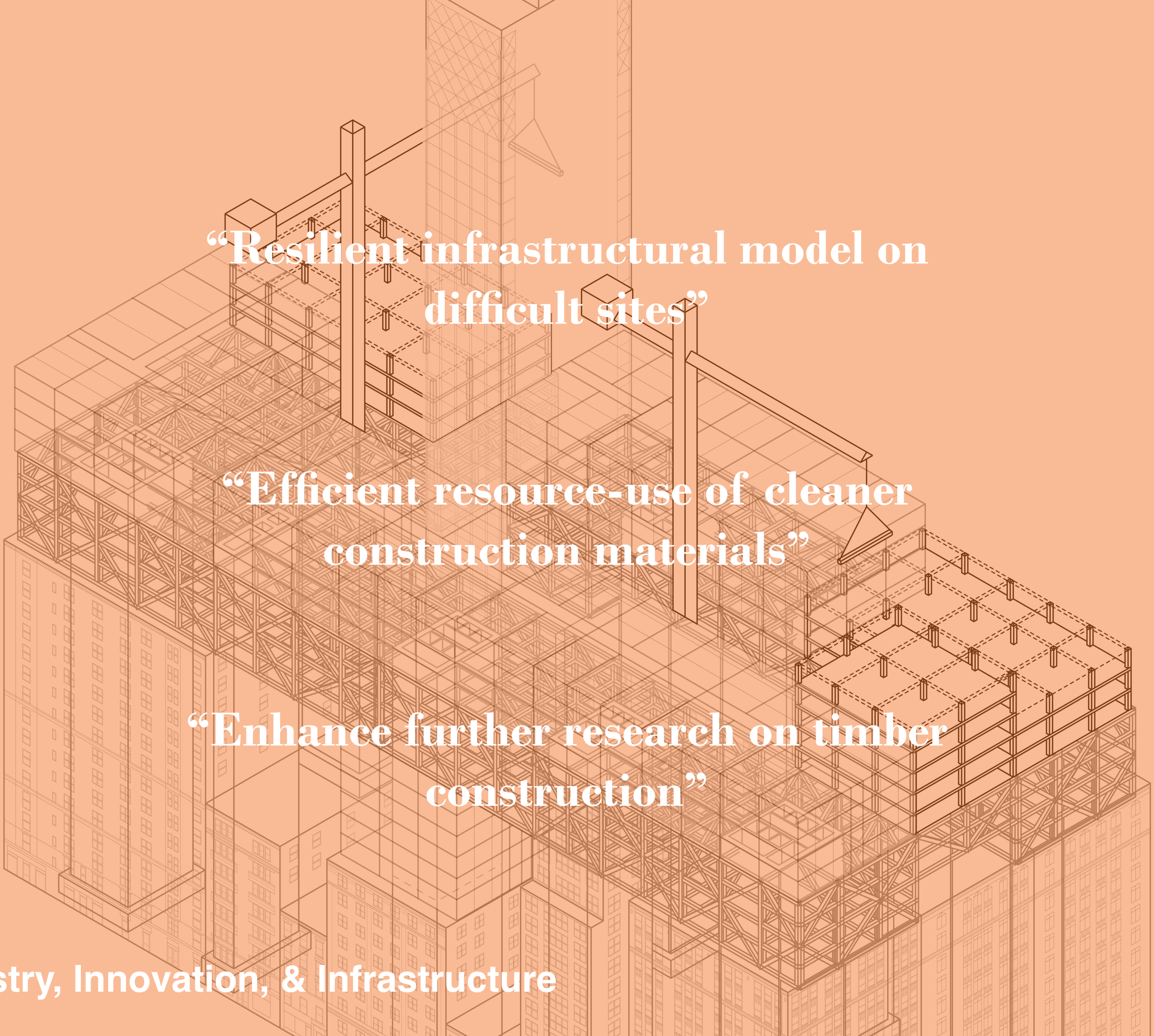
“Well-being promotion for people with dissabilities”

“Better access to health-care services”

3 Good Health & Well-Being



8 Decent Work & Economic Growth



“Resilient infrastructural model on difficult sites”

“Efficient resource-use of cleaner construction materials”

“Enhance further research on timber construction”

9 Industry, Innovation, & Infrastructure

“Access to affordable housing and public spaces”

“Inclusive human environment: workers, residents, visitors…”

“Environmentally-friendly construction and maintenance”

11 Sustainable Cities & Communities

Mad Heights

Mad Heights

Elevate the Common Dwelling

