

THE TIMBER ON 5TH

781 FIFTH AVENUE

GREENWOOD HEIGHTS,
BROOKLYN, NEW YORK CITY

Masters in Real Estate
Development
Columbia University
Spring 2026

Capstone Group 12

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PROJECT SUMMARY

This project evaluates whether sustainable and innovative multifamily construction can achieve lifecycle cost parity or superiority over conventional development by strategically optimizing structural systems, advanced materials, high-performance envelopes, and prefabricated construction techniques while also reducing carbon emissions through parametric financial modeling. By integrating Grasshopper-based design optimization with a full development pro forma, the study tests when mass timber, low-carbon materials, electrification, and off-site construction can enhance developer IRR, reduce operational risk, and increase exit valuation.

33

UNITS

27,573 SF

GROSS FLOOR AREA

R6B

ZONING DISTRICT

\$6.68 M

TOTAL EQUITY
REQUIRED

\$22.7 M

TOTAL DEVELOPMENT
COSTS

2.98x

LEVERED EQUITY
MULTIPLE

~15.2%

18.2%

~20.3%

PROJECT LEVERED IRR
(Base-Case & Optimized)

MONTH
19

Construction
Completion

MONTH
22

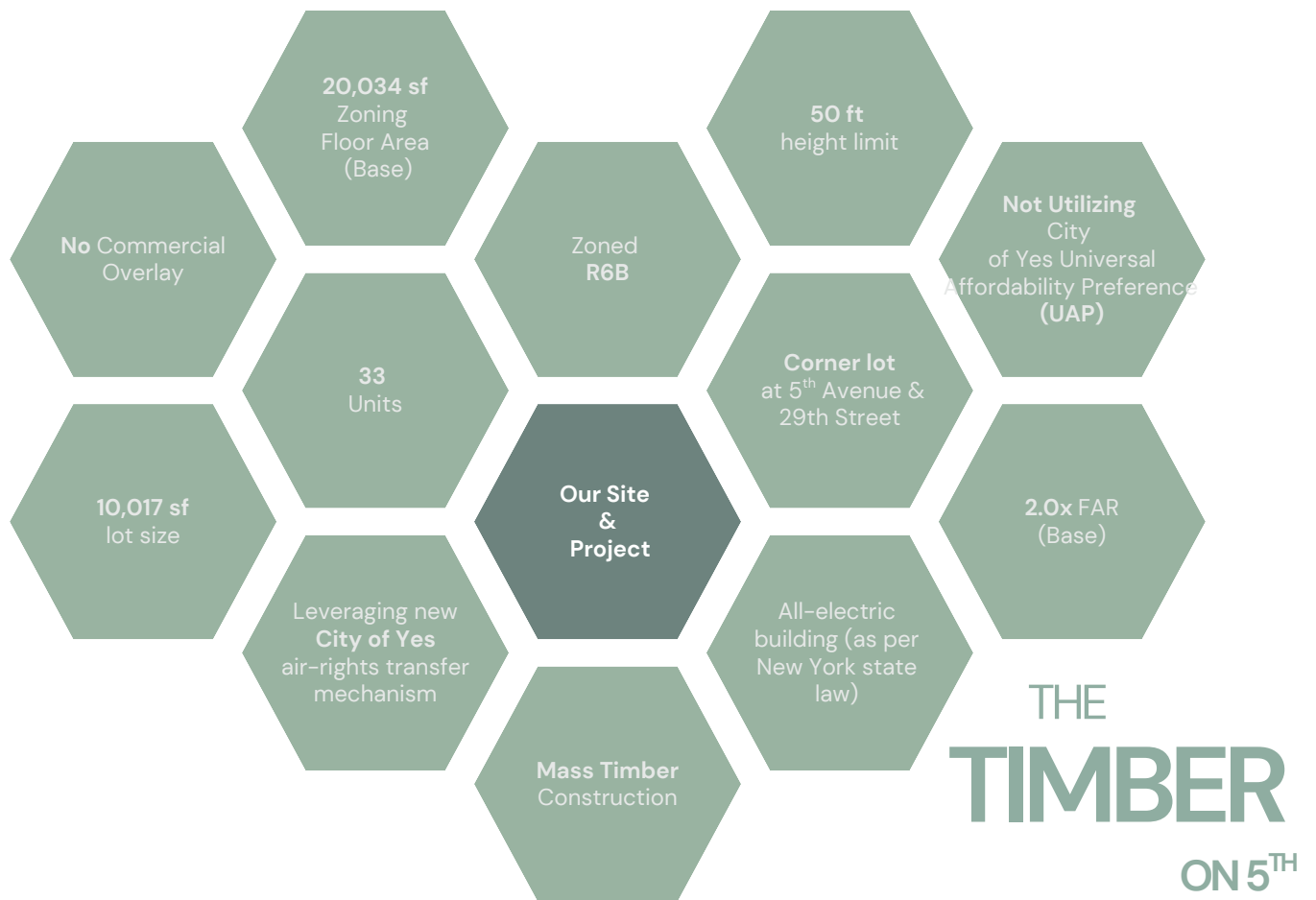
Stabilization

MONTH
27

Refinance

YEAR
10

Sale



GREENWOOD HEIGHTS

Greenwood Heights is a quiet, residential enclave in South Brooklyn defined by a stable, community-oriented character and gradual demographic evolution. The neighborhood is anchored by long-time working- and middle-class residents, including multi-generational households, and has recently attracted a growing population of young professionals, couples, and small families seeking relative affordability and larger living spaces compared to prime Brooklyn submarkets.

The area offers a low- to mid-rise urban fabric, wider streets, and a more relaxed residential atmosphere, distinguishing it from denser, higher-priced neighborhoods nearby. Its proximity to Greenwood Cemetery provides a unique open-space amenity, enhancing light, views, and overall livability—key drivers of residential demand.

Greenwood Heights benefits from strong rental fundamentals, supported by a renter-heavy population, stable occupancy, and limited new supply, while maintaining accessibility to major transit lines (R, N, D) and nearby retail corridors. The neighborhood appeals to residents seeking a balance between affordability, space, and quality of life, rather than a highly activated or luxury-driven environment.



DEMOGRAPHIC OVERVIEW

GREENWOOD HEIGHTS, SOUTH BROOKLYN

Greenwood Heights offers a strong demographic foundation for a multifamily development targeting young professionals and small families seeking higher-quality rental housing. With a population of ~40,000, a median age of 37.4, and a median household income of ~\$138,000, the area reflects early- to mid-career residents with growing purchasing power. Continued income growth and a strong 25–44 age cohort support demand for design-forward, upgraded housing, positioning the neighborhood as an attractive alternative to more established and expensive Brooklyn markets.

POPULATION

40,281

0.7% year-over-year growth

MEDIAN AGE

YEARS

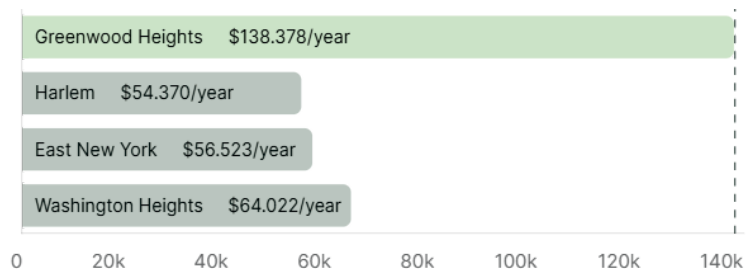
37.4

3.03% 1-year increase

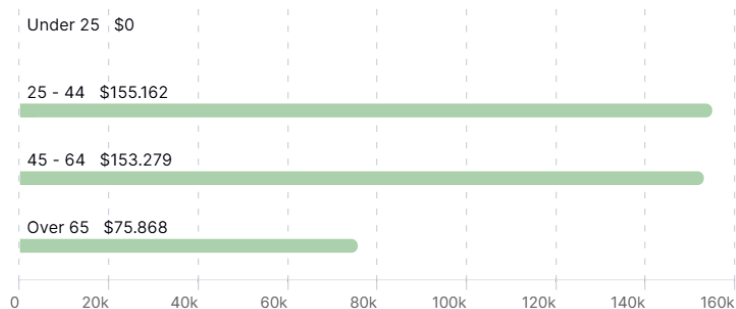
MEDIAN HOUSEHOLD INCOME

\$138,378 / year

3.2% year-over-year growth



INCOME DISTRIBUTION BY AGE



MEDIAN GROSS RENT

\$2,448 / month

This analysis section is based on the Greenwood Heights area

This is complemented by a psychographic mix of aspirational renters and established households across mid- to upper-income brackets. We are targeting residents who value quality, lifestyle-driven amenities, and neighborhood character, supporting demand for thoughtfully designed, community-oriented living environments.



HOUSING MARKET ANALYSIS

GREENWOOD HEIGHTS, SOUTH BROOKLYN

NUMBER OF
HOUSING UNITS

17,347

0.3%year-over-year change

NUMBER OF
OCCUPIED HOUSING UNITS

16,017

0.0%year-over-year change

NUMBER OF
HOUSEHOLDS

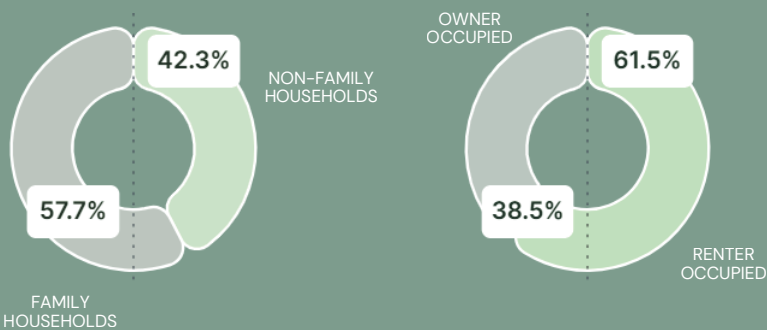
16,017

0.0%year-over-year change

AVERAGE PEOPLE PER
HOUSEHOLD

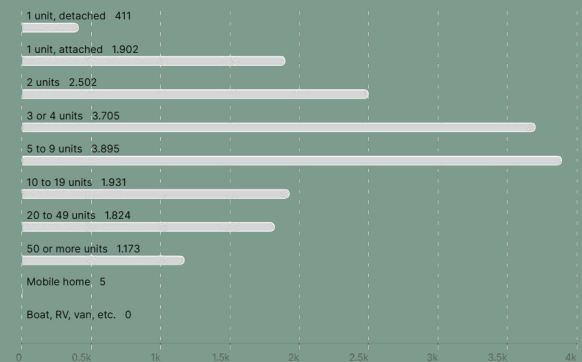
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HOUSEHOLD COMPOSITION



Source 1: Point2Homes Greenwood Heights, Brooklyn, NY Demographics

HOUSING UNIT TYPES



MEDIAN GROSS RENT

\$2,448

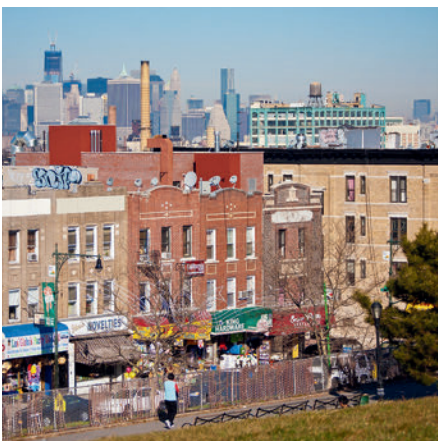
Greenwood Heights demonstrates strong housing fundamentals, with stable occupancy and limited new supply supporting sustained rental demand. A low vacancy rate (~7.7%), minimal recent deliveries (56 units since 2020), and a renter-majority profile (~61.5%) position the neighborhood to absorb new, higher-quality product. As nearby prime Brooklyn neighborhoods continue to price out the borough, Greenwood Heights offers a compelling opportunity to capture residents willing to pay a premium for quality, amenities, and proximity to transit and open space while maintaining relative affordability.



THE BUILT ENVIRONMENT

Greenwood Height's built environment ranges from early-1900s rowhouses and pre-war brick buildings to small apartment structures. Residential streets are largely low to mid-rise with ground floor retail on major avenues; industrial remnants remain near the waterfront and along the southern border of Greenwood Cemetery on 39th Street.

The neighborhoods' built environment is further defined by a fine-grain urban fabric, with relatively small block sizes and a mix of attached and semi-attached buildings that reinforce a strong street wall. Building heights are generally modest, contributing to a human-scaled streetscape, while zoning patterns reflect a transition from residential neighborhoods to mixed-use corridors and legacy industrial areas. Limited new construction has preserved much of the neighborhood's historic character, with recent development tending toward contextual infill rather than large-scale redevelopment.



VALUE PROPOSITION FOR STAKEHOLDERS

DEVELOPER



What Matters

Hard and Soft Costs
Construction duration
Financing carry
Rent-up velocity/absorption rate
Exit cap rate

Value Levers

Fast Construction → Lower interest carry
Mass timber → reduction foundation cost (lighter building)
Prefab → shortened overall timeline and lower labor exposure
Energy efficiency → Green Financing
ESG narrative → cap rate compression at exit

Key question: Does sustainability increase IRR?

LONG-TERM OWNER / OPERATOR



What Matters

Operating expenses
(e.g., utilities, maintenance)
Tenant turnover
Asset longevity
Regulatory Risk
(e.g., Local Law 97 type exposure)
Exit value

Value Levers

Electrification → Lower future carbon penalties
Better envelope → lower HVAC size + lower utility cost
Durable materials → Lower capex reserves
Healthier indoor air → lower turnover

Key question: Does sustainability increase NOI and reduce risk?

TENANT / RENTER



What Matters

Rent
Utility bills
Comfort
Health
Brand perception

Value Levers

Lower monthly utilities
Better thermal and livability comfort
Natural materials (aesthetic and wellness focus)
ESG identity alignment

Key question: Can you justify rent premium OR reduce effective cost of living?

COMMUNITY



What Matters

Housing affordability
Neighborhood character
Local economic activity
Public realm quality (streets, open space)
Environmental impact

Value Levers

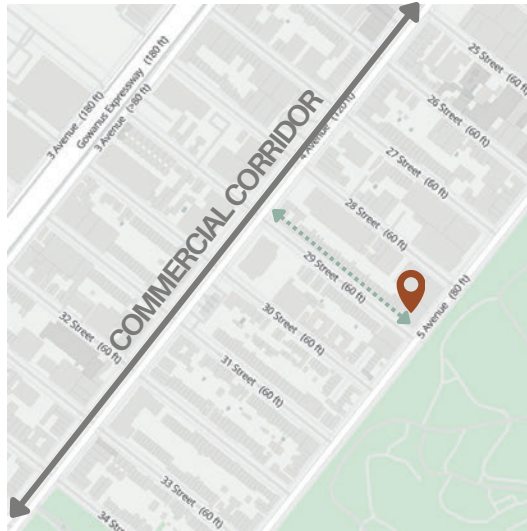
Mixed-income housing → broader community access
Sustainable design → reduced neighborhood environmental burden
Public space improvements → stronger street life and safety
Local hiring / construction participation → economic benefit

Key question: Does sustainability increase NOI and reduce risk?

CONTEXTUAL ANALYSIS

781 5TH AVENUE

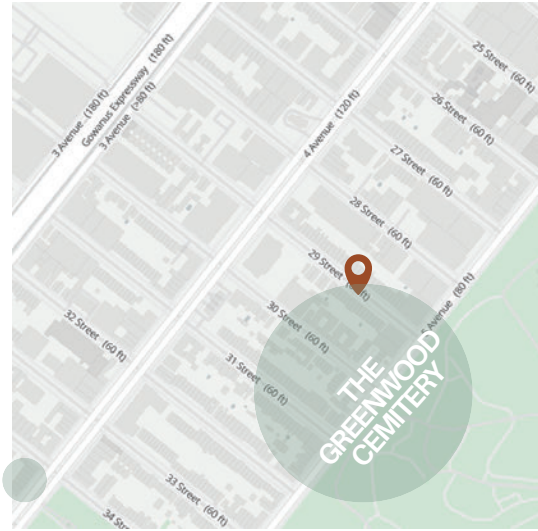
ECONOMIC



Conveniences Accessibility

One block away from the neighborhood's primary commercial corridor, providing quick access to groceries, services and daily needs, while also in a predominantly residential calm area by the park.

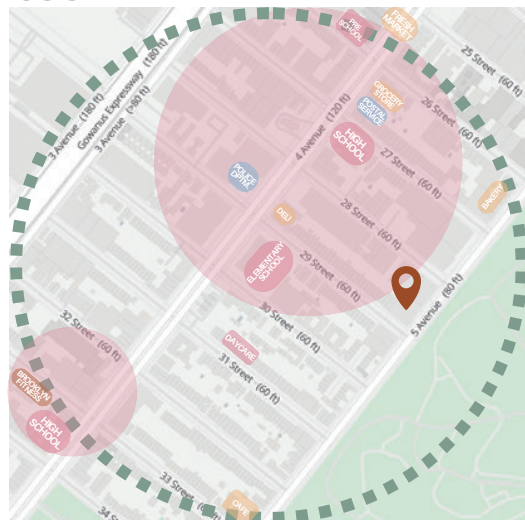
ENVIRONMENTAL



Green Space Advantage

Within a park-deficient area, Green-Wood Cemetery functions as a significant green asset—offering open views, landscape relief, and growing use as a community leisure space, reinforcing its role as a neighborhood amenity rather than a stigma.

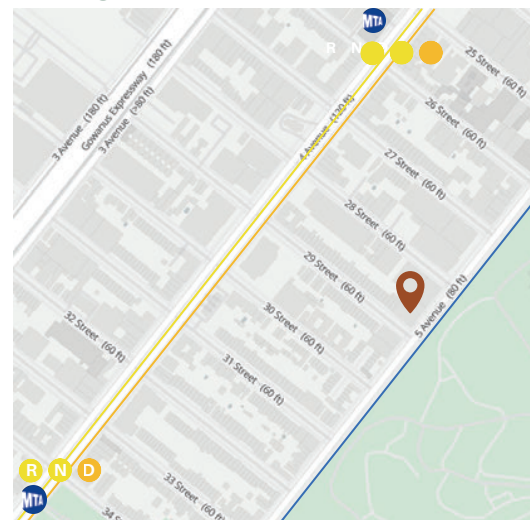
SOCIAL



Neighborhood Infrastructure

The site is surrounded by a strong network of social infrastructure, including schools, local markets, daycare facilities, and civic institutions, all within walking distance—supporting daily convenience and neighborhood livability.

TRANSIT



Transit Access

The site is a 7-minute walk from subway access (R, N, D lines), providing direct connections to South Brooklyn (10–15 min) and Manhattan (25–30 min), and is further supported by a bus route along 5th Avenue and a Citi Bike dock directly in front of the site.

ACQUISITION STRATEGY

LOCATION ADVANTAGE

WHY HERE

Park Slope
proximity at a
discount

Transit-supported density

Durable open-space premium

SITE FUNDAMENTALS

WHY THIS SITE

Efficient geometry for multifamily

Underbuilt parcel

Air rights from neighboring lots

COMPETITIVE EDGE

WHY WE WIN

Credible off-market basis

No commercial overlay





TRANSFER OF DEVELOPMENT RIGHTS FROM ADJACENT LANDMARK

AIR RIGHTS AVAILABILITY MAP



4,007 SF

AIR RIGHTS PURCHASE

Air-rights purchase from landmark limited to a maximum of 20% of base F.A.R per ZR

\$120 /SF

ACQUISITION PRICE

~50% of market value for raw land in neighborhood

TDR SOURCE

Green-Wood Cemetery's main gate is a designated city landmark, unlocking tens of millions of sf of unused air rights to be purchased from 226 eligible neighboring lots.

TDR PRICING

Pricing is in-line with general TDR proportional rates and a recent nearby transaction, but reflects a discount to the nominal rates seen in the broader TDR market. This is driven by the more limited buyer pool in the area.

CITY OF YES LANDMARK TDR BENEFITS

City of Yes significantly **broadened eligibility for and simplified** the acquisition of unused development rights from City-designated landmarks. This creates three key advantages for the project:

- **Expanded Transfer Eligibility** — Development rights can now be sourced from landmark properties across Fifth Avenue, not just immediately adjacent lots. This opens up the cemetery structures directly across the street as a viable source of transferable development rights.
- **Streamlined Acquisition** — The project can source all needed TDR from a single landmark property, replacing what would otherwise require a complex assemblage negotiated across four or more adjacent property owners.
- **No ULURP Required** — Landmark development rights transfers are now as-of-right, eliminating the lengthy and uncertain ULURP that was previously required for these transactions.

NEW CITY OF YES LANDMARK TDR REGULATIONS: ZR §75-42

CITY OF YES ZONING BENEFITS

City of Yes allowances and deductions applicable to this site

Deduction	Utilized
No off-street parking requirement Structured or underground parking alone would have killed the deal	Critical to feasibility ✓
Refuse disposal ZFA deduction 3 SF per unit deducted from ZFA	✓
Corridor area deduction 50% of qualifying corridor area deducted	✓
Qualifying residential amenities deduction Up to 5% of ZFA deductible — gym, package room, etc.	✓
High Performance building envelope deduction (Zone Green) 5% ZFA deduction	✓
Qualifying bike room exclusion Excluded from ZFA entirely	✓

All listed deductions are applicable to this site and incorporated into our ZFA strategy.

IS CITY OF YES' UNIVERSAL AFFORDABILITY PREFERENCE PREFERABLE?

UAP WORKS:

For projects with 10 units or fewer

In neighborhoods (generally within or close to Manhattan) with very high market rents

In neighborhoods where the market supports a high concentration (>70%) of studio and one-bedroom units

In zones with low height limits but lots of FAR (*UAP height bonus unlocks trapped base ZFA alongside UAP FAR bonus providing additional FAR*)

For projects with less than 100 units but greater than 60 units
(*Above 60 units, each incremental affordable unit generates sub-10% change in overall affordable unit count*)

If it had a legally viable homeownership pathway

UAP DOES NOT WORK:

In outerborough neighborhoods with moderate market rents
(*485x often isn't enough of a financial benefit relative to the income drag from the affordable units*)

In neighborhoods where larger units are expected (*triggering UAP compliance pathway where 50% of affordable units must be two-bedroom or larger*)

Works marginally between 30-60 units, but only given very specific site conditions

Above 10 units but below 30 units
(*This is due to rounding issues with the large unit requirement and 485-x*)

After running multiple scenarios with and without UAP, we elected NOT to utilize UAP due to financial unviability given programmatic and zoning constraints – with a zoning compliant unit mix, we needed to boost rents on market units by 33% to achieve necessary returns

WHAT IS HAPPENING IN THE SURROUNDING AREA

UPCOMING RESIDENTIAL PROJECTS

6208 8th

- Under construction
- 28-story, 297 unit complex
- Watermark Capital and Rubin Equities secured a \$210 Million construction loan
- Completion within 2 years
- Largest apartment building in the neighborhood

179 20th

- Permits filed
- 11-story, 26 unit condo
- INOA Architecture as AoR
- Retail and community facilities components

280 19th

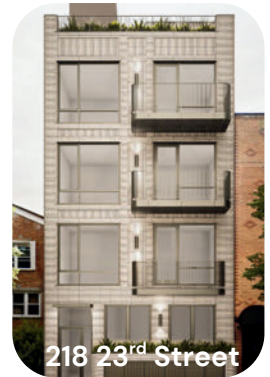
- Permits filed
- 5-story, 6 units
- Archwey Architect as AoR
- Single family home is being demolished, with this project to replace

218 23rd

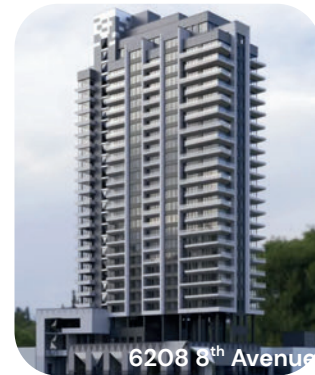
- Renderings released
- 4-story, 4 unit condo with private outdoor spaces
- Designed by Input NYC | Developed by Kings Capital



179 20th Street



218 23rd Street



6208 8th Avenue

INFRASTRUCTURE AND ECONOMIC DRIVERS

South Brooklyn Marine

- Under construction
- \$861 Million, 73-acre project
- On border of Sunset Park and Greenwood Heights
- Built to support the Empire Wind 1 offshore wind farm
- Built with over 1,000 union jobs
- Expected completion in Summer 2026

MADE Bush Terminal /

- Under construction
- \$25 Million redevelopment of Pier 6 into public waterfront space
- NYCEDC
- Completion late 2026

Grand Prospect Hall

- Development permits filed
- 5-story mixed-use building on 263 Prospect Avenue (former Grand Prospect Hall)
- 147 residences and 180 enclosed parking spaces
- The hall sold for \$22.5 Million to Gowanus Cubes
- Hill West Architects as AoR



MADE Bush Terminal / Pier 6



South Brooklyn Marine Terminal

**The existing development pipeline in the surrounding neighborhood is almost exclusively boutique to mid-sized condo and rentals. Institutional capital is actively investing in this neighborhood, validating the demand for new housing and amenities. By adding quality housing to an area that remains undersupplied relative to the rest of Brooklyn, this project will contribute to the establishment of residential density that will support restaurants, retail, and community infrastructure, making the neighborhood thrive long-term.*

COMPARABLE PROJECTS



Address	Class	# of Units	Unit Mix	Average Unit Sizes	Year Built	Building Amenities
734 5 th Ave	B	19	1 B	1-Bed - 637 SF	2021	Doorman Roof Terrace
584 Fourth	B	46	Studio 1 B 2 B	-	2023	Fitness Center Business Center Grill Roof Terrace
194 21 st Street (The Hyland)	B	26	1B 2B 3B	1-Bed - 700-900 SF 2-Bed - 900-1,100 SF 3-Bed - 1,287 SF	2017	Gym, roof deck, kid's playroom, doorman,, washer/dryer
875 4th Avenue (875 Fourth)	A	150	Studio 1B 2B	Studio - 320 SF 1-Bed - 582 SF 2-Bed - 776 SF 3-Bed - 1356 SF	2023	Roof deck, kid's playroom, co-working space, pet spa, parking, washer/dryer
The Capstone	A	33	Studio 1B 2B 3B	Studio - 441 SF 1-Bed - 581 SF 2-Bed - 754 SF 3-Bed - 899 SF	2028	Private terraces, gym, communal rooftop washer/dryer

STUDIOS

\$2,898 - \$3,103

average rent between
comps

1 BED

\$3,327 - \$3,882

average rent between
comps

2 BED

\$4,521 - \$5,574

average rent between
comps

3 BED

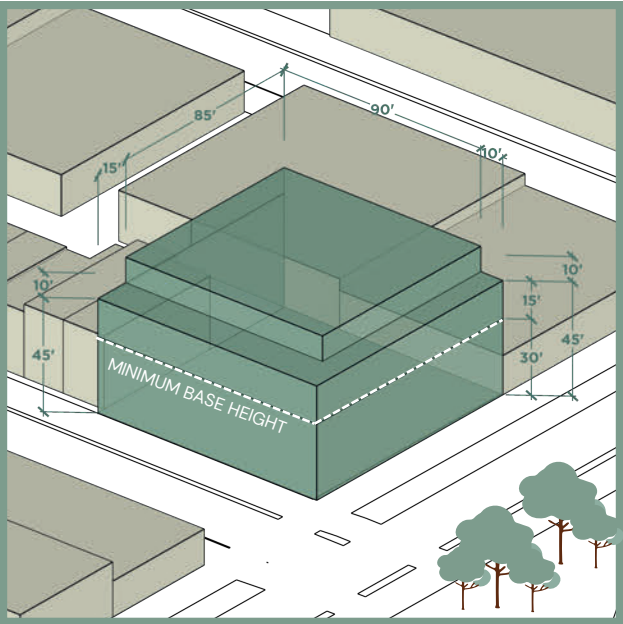
\$6,909 - \$7,730

average rent between
comps

Source: CoStar

PROPOSED BUILDING MASSING

NON-UAP ZONING ENVELOPE

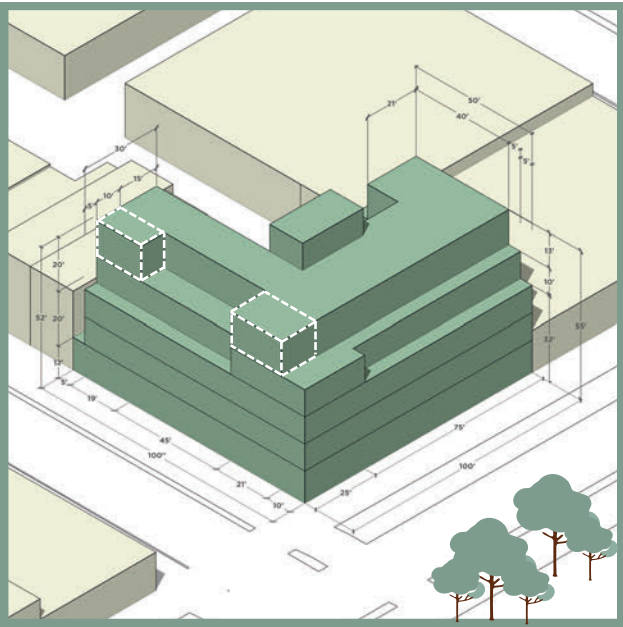


27,573 SF
OF GROSS FLOOR AREA

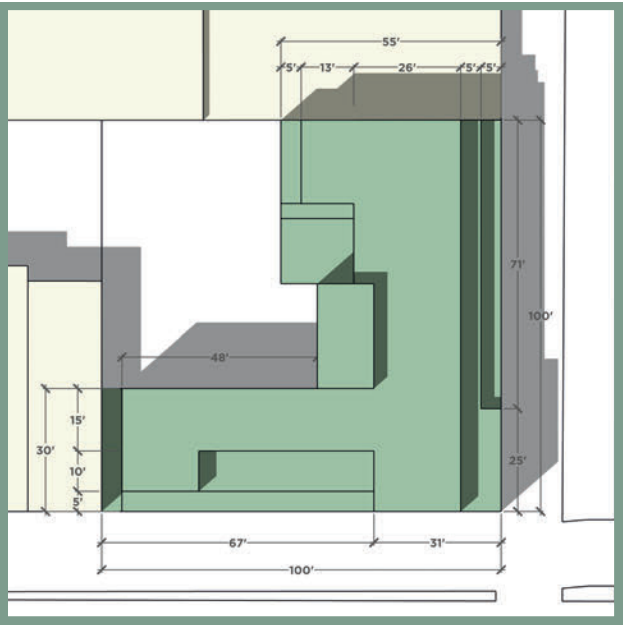
24,037 SF
OF ZONING FLOOR AREA

Lot Area	10,017 SF
Non-UAP FAR	20 x
Buildable ZFA as-of-right	20,034 SF
Additional ZFA from air-rights purchase	4,007 SF
Total Buildable ZFA	24,041 SF

PROPOSED MASSING



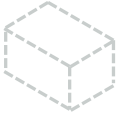
SITE PLAN



L shape maximizing unobstructed park views



Hybrid single and double loaded bar configuration to create private rear yard spaces for ground-floor units while maximizing ZFA utilization on upper levels.



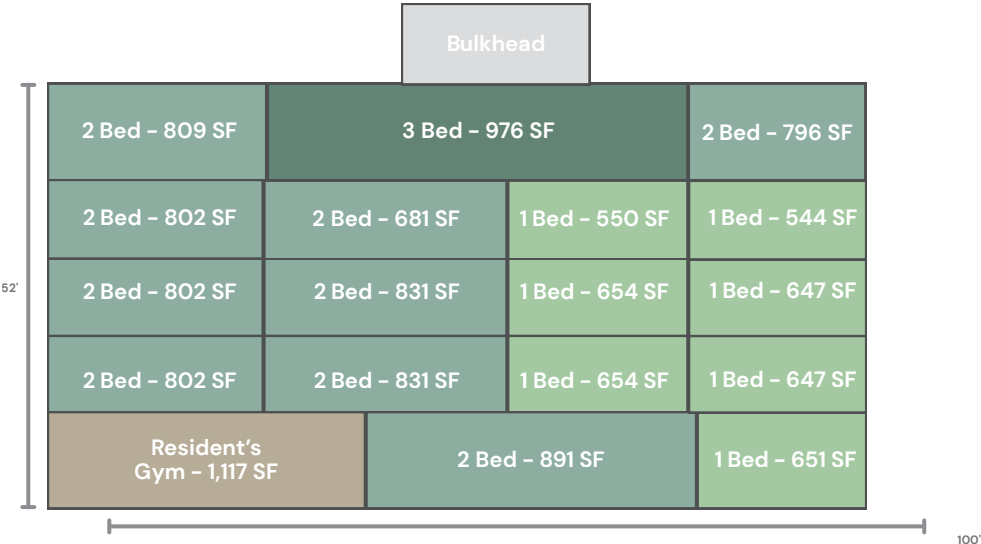
Use of dormers to mitigate the impact of required setbacks on unit layouts in the narrower building bar.



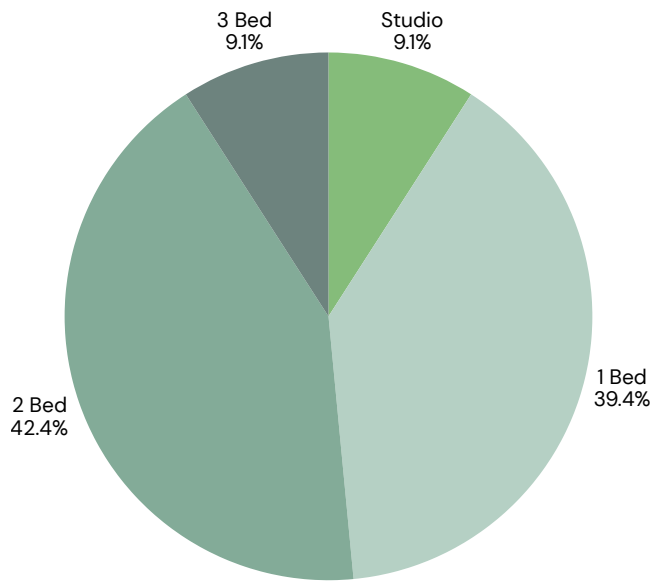
Segmentation of required setbacks to maximize the number of units with park-facing terraces.

FLOOR AREA SCHEDULE

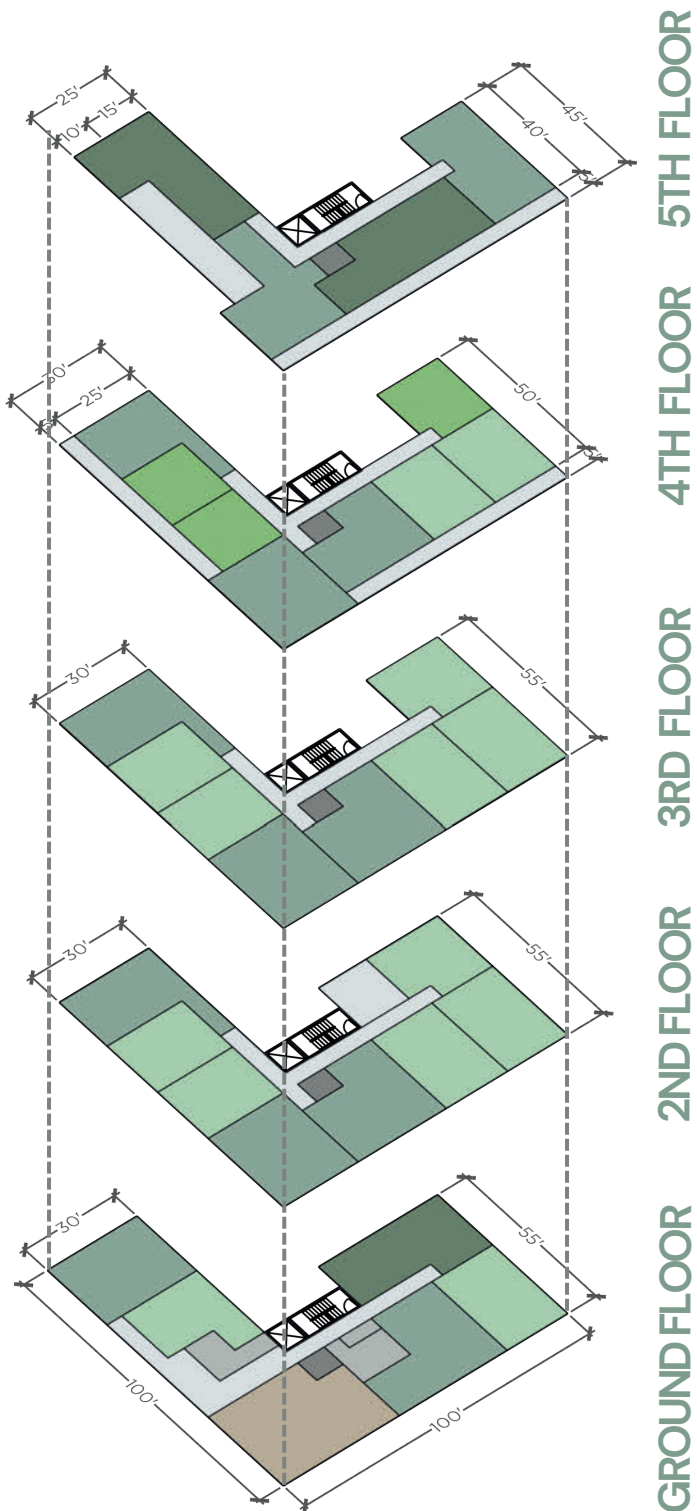
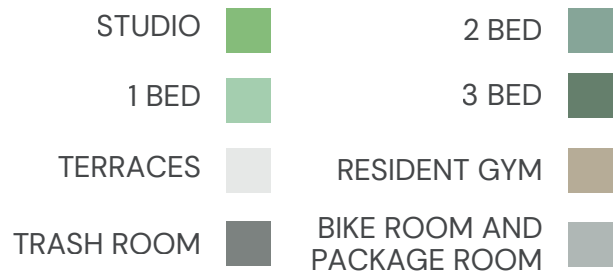
Floor	Residential	Corridor	Lobby Space	Core	Trash Room	Bike Room	Amenities
1	3611	662	150	232	72	214	1403
2	5227	419		232	72		
3	5227	419		232	72		
4	4492	419		232	72		
5	3487	321		232	72		
Rooftop		129		232			
Gross Floor Area	22,044	2,369	150	1392	360	214	1403
ZFA Deduction Allowance	100%	50%	100%	100%	100%	0%	100%
					72		1,202
Zoning Floor Area	22044	1184.5	150	1392	288	0	201
Used ZFA Subtotal	25,259						
Zone Green Deduction	1,202.05	5%					
Final ZFA	24,037.4						



UNIT MIX



Unit Type	# of Units	Average Unit Sizes (sf)	Avg. Rent
Studio	3	433-457	\$3,000
1 Bed	13	524 - 654	\$3,600
2 Bed	14	591 - 892	\$5,475
3 Bed	3	815 - 976	\$7,200



PROJECT MATERIALS

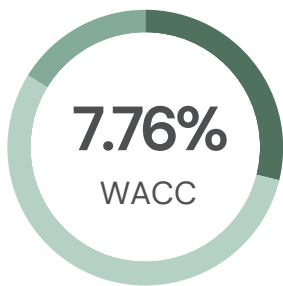


The project's material palette balances raw architectural **concrete** and warm **wood tones** with **blackened steel** detailing. The contrast between cool grey tones and warm organic finishes create a refined industrial aesthetic that is rooted in the historical context of the surrounding neighborhood while supporting environmentally conscious design.



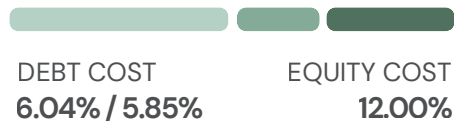
SOURCES AND USES

CONSTRUCTION SOURCES



- Construction Loan
- C-PACE Loan
- Equity

WACC BREAKDOWN



	% OF TOTAL	TOTAL CAPITAL
Construction Loan	55.0%	\$12.51M
C-PACE Loan	15.6%	\$3.55M
Equity	29.4%	\$6.68M
TOTAL		\$22.75M

PERMANENT DEBT

Agency Perm Loan **\$16.06M**
RATE **5.45%** TERM **7 yrs** AMORT **30 yrs**

STAB. NOI \$1.36M Annual	DEBT. SERVICE \$90,685 Monthly
MAX LTV 80% NOI Constraint	MIN DSCR 1.25X NOI Constraint

KEY ASSUMPTIONS & RETURNS

\$797 /GSF

Total Development Cost

Total Development Cost of \$22.26M including acquisition, soft & hard costs, fees, contingency, and financing. Hard cost estimate is \$425/GSF, based on input from local developers, exceeding the minimum \$250/GSF hard cost estimate for NYC multifamily sourced by RLB.

\$4,688

Year 1 Avg. Proj. Rent

Rent PGSF based on local comps, rent premium for park access, and inclusion of terraced spaces.

\$4.0M

Land Acquisition Price

Purchase price estimated at \$450 per RBA based on the average of recent warehouse sales in South Brooklyn

24 Month

Total Development
Period

The project is expected to take approximately 24 months from acquisition to final stabilization, reflecting typical NYC timelines for design and DOB approvals (4 months), construction of a mid-rise apartment building (14 months), and a compressed 4 month absorption period for boutique Brooklyn new development.

Returns Summary

Project-Level

14.4%

Levered IRR

GP-Level

18.2%

Levered IRR

LP-Level

14.0%

Project Levered IRR

2.40x

Levered EM

2.99x

Project Levered EM

2.34x

Project Levered EM

\$9.65M

Levered Profit

\$1.37M

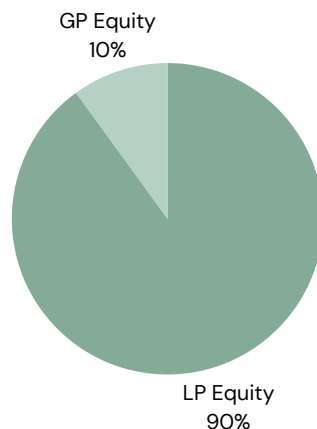
Levered Profit

\$8.28M

Levered Profit

PARTNERSHIP STRUCTURE

EQUITY SPLIT



Standard, Streamlined Partnership Structure

No mezzanine/preferred equity layers. Double promote model with a straightforward waterfall structure provides for investor clarity and aligned incentives.

PROMOTE WATERFALL

Return of Capital

100% of invested capital returned to all partners pro rata before any profit distribution



12% Preferred Return

LP receives 12% return before promote is triggered. Higher preferred return hurdle is structured to deliver minimum required LP return within single-tier promote structure



20% & 30% GP promote

Above the 12% pref, GP receives 20% of excess profits, and above 15% pref, GP receives 30% of excess profits as industry-standard performance incentive

The 12% hurdle reflects the opportunistic risk profile of this investment, guaranteeing LPs a strong baseline return before the GP participates in any upside

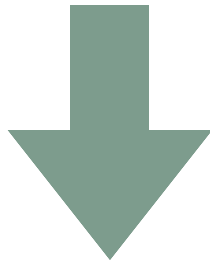
PARAMETRIC DEVELOPMENT ENGINE – GRASSHOPPER

We built a parametric modeling engine that links computational design, lifecycle carbon analysis, and financial performance modeling to evaluate 400+ pereto front building configurations simultaneously — proving that at 781 Fifth Avenue, the most sustainable designs deliver the highest investor returns, not the lowest.

In this framework, design optimization becomes financial optimization.

DESIGN VARIABLES

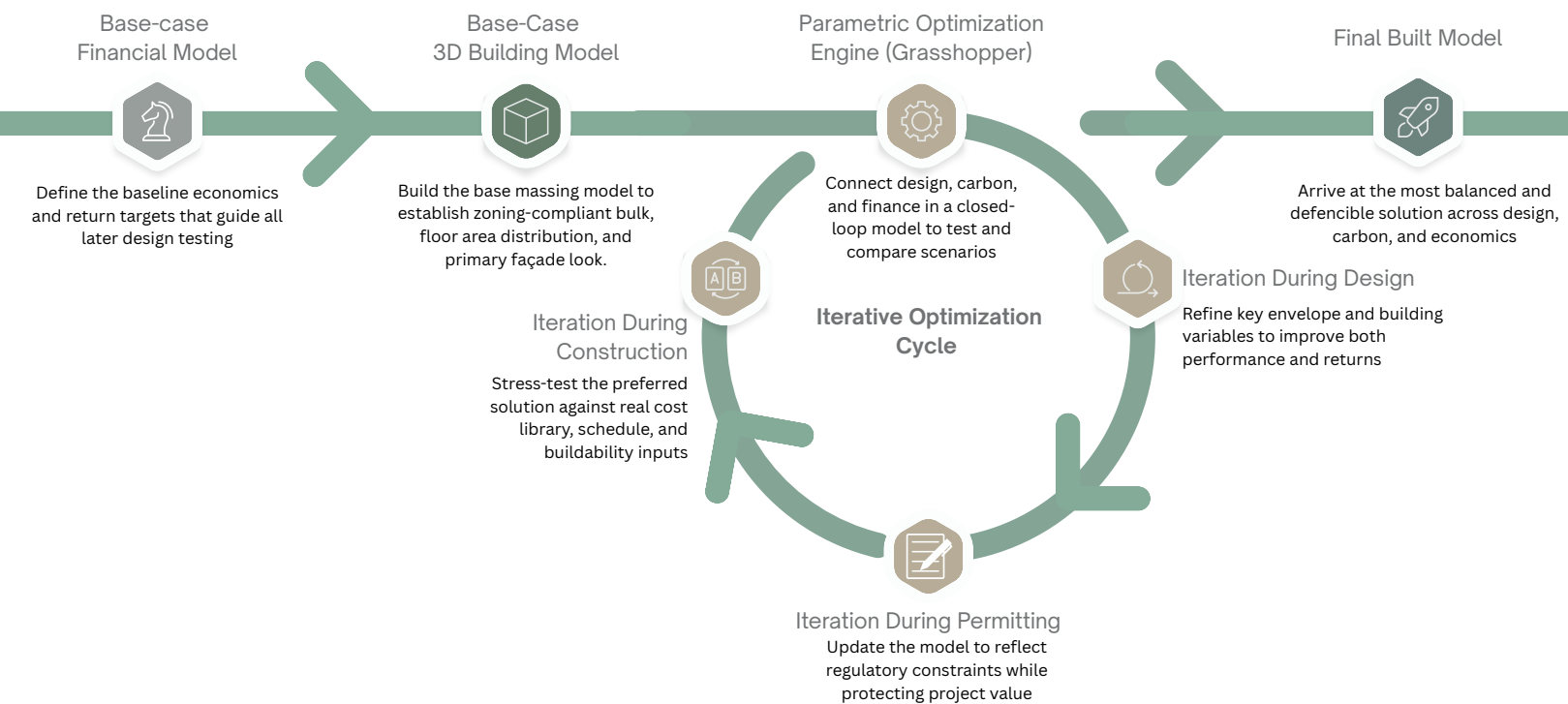
Structural system
(steel vs. mass timber vs. hybrid)
Envelope R-values
Window-to-wall ratio
Mechanical system type
Prefab percentage



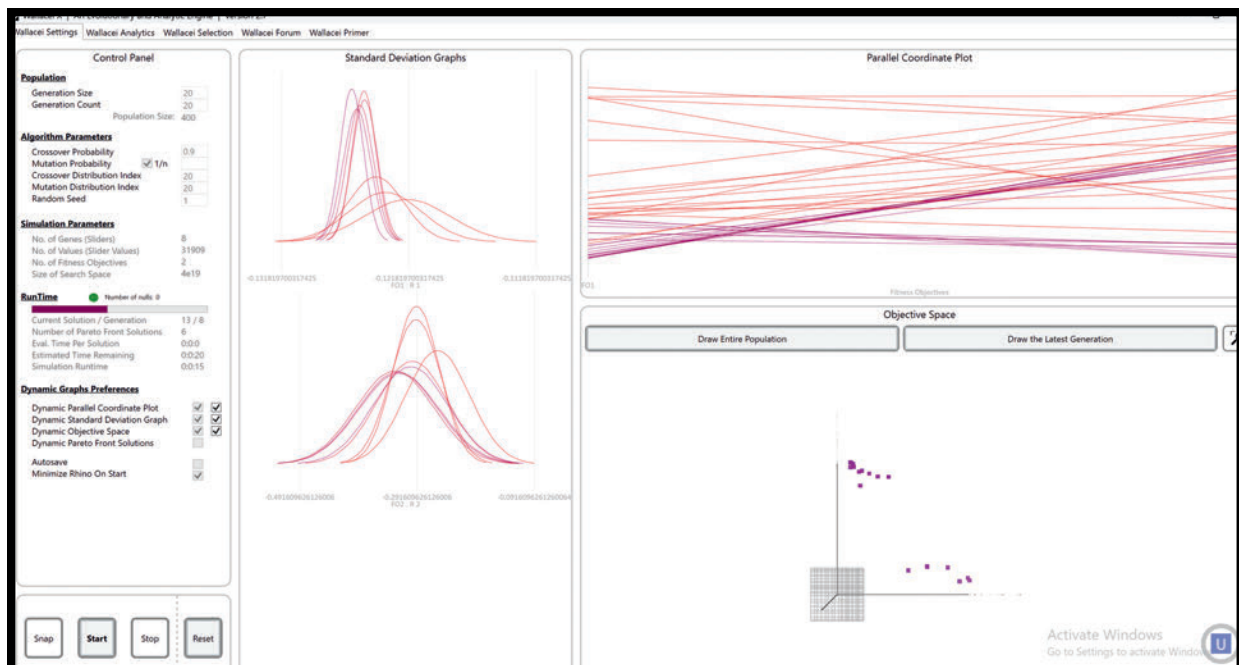
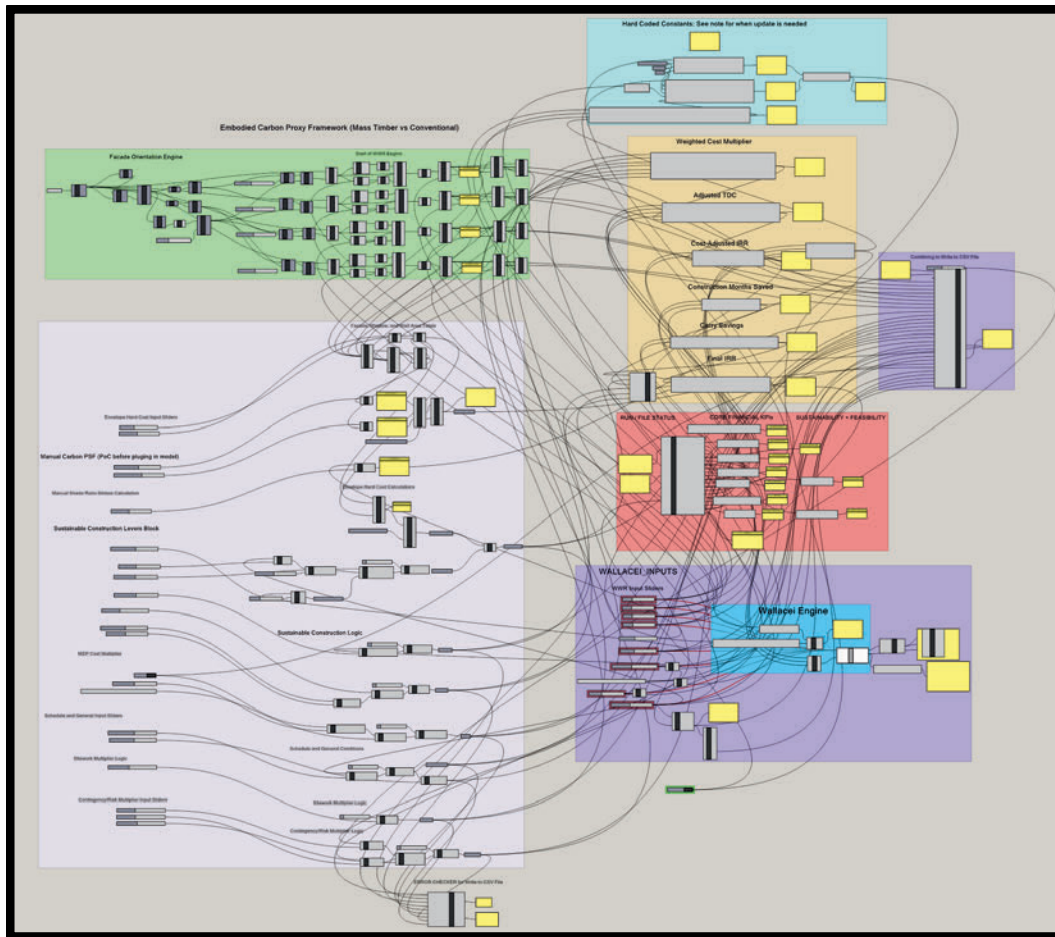
FINANCIAL OUTPUTS

Hard cost per SF
Construction duration
Financing carry
Operating expenses
IRR
Equity multiple
Exit value

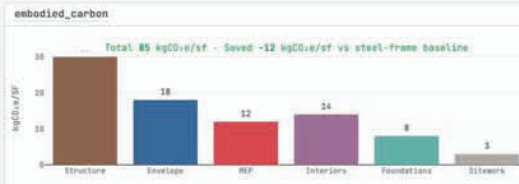
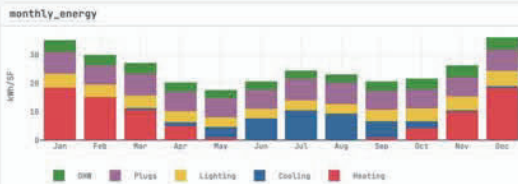
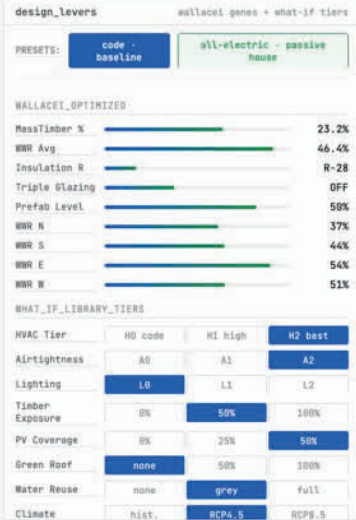
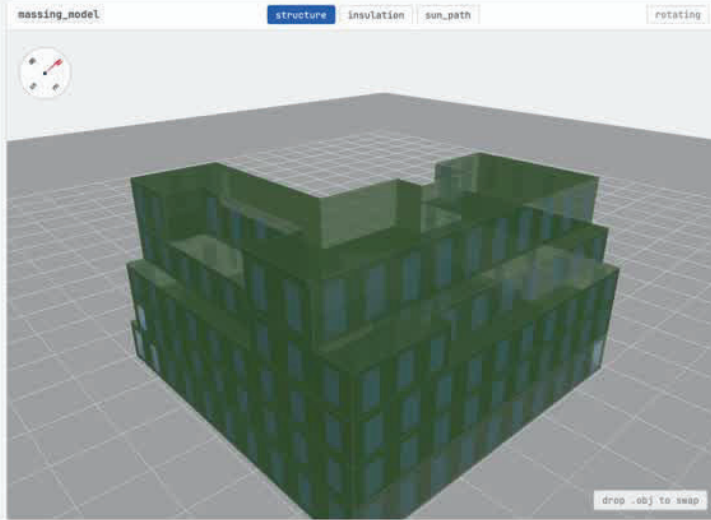
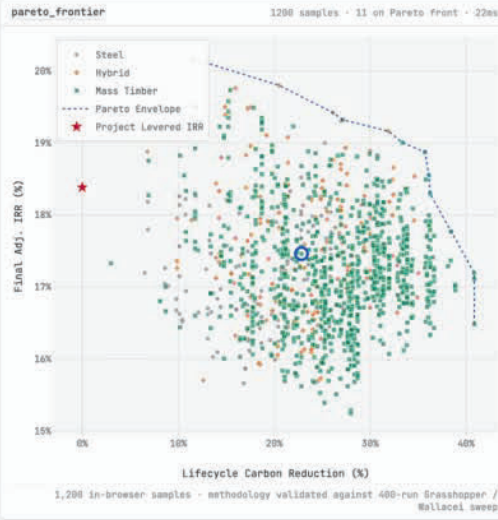
ITERATIVE OPTIMIZATION



GRASSHOPPER PARAMETRIC MODEL BACKEND



equity_multiple 2.58x optimized_irr 17.46% carbon_reduction 22.8%



THE TIMBER ON 5TH

781 FIFTH AVENUE

GREENWOOD HEIGHTS, BROOKLYN,
NEW YORK CITY

Master in Real Estate Development
Columbia University
Spring 2026

Capstone Group 12

Daniela Solovey (ds3465)
Ivan Levin (isl2129)
Jesse Silva (jds2347)
Sofia Sanglard (ssr2205)
Sterling Grimes (sg4619)

WHY INVEST?



APPENDIX

GROUND FLOOR



2ND AND 3RD FLOORS



4TH FLOOR



5TH FLOOR



INTEGRATED PERFORMANCE ENGINE: FINANCIAL + ENVIRONMENTAL OPTIMIZATION

Key output KPIs used to evaluate financial feasibility and environmental performance

Unlevered IRR

The annualized return generated by the project based purely on project cash flows, before the impact of financing. It measures the intrinsic performance of the development itself and allows comparison across different capital structures.

Lifecycle Carbon

The total embodied and operational carbon emissions generated by the building over its modeled lifecycle. This includes material production, construction impacts, and long-term energy use. It measures total environmental footprint.

Carbon Reduction %

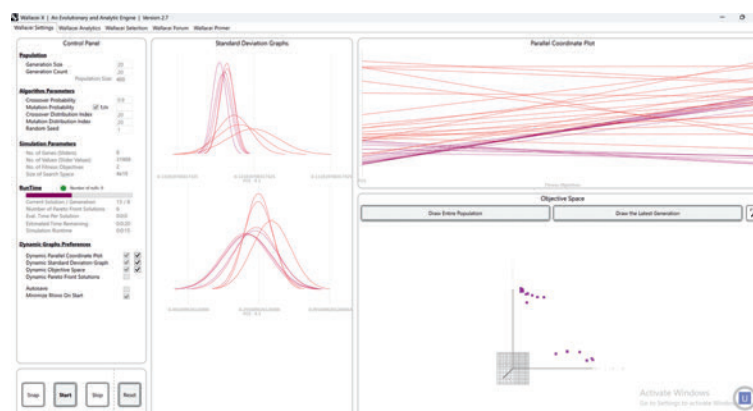
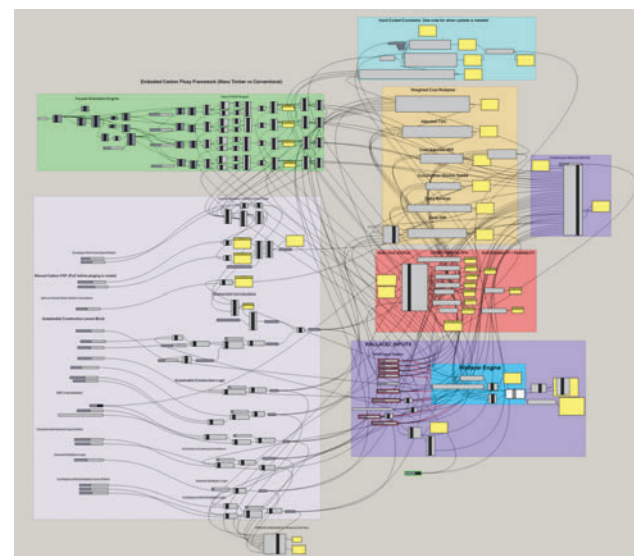
The percentage reduction in lifecycle carbon compared to a defined baseline (e.g., conventional construction). It quantifies the environmental benefit created by sustainable materials, systems, and envelope strategies.

Schedule (Months)

The total estimated development timeline from construction start to stabilization. It reflects the impact of construction methods, prefabrication, and system complexity on delivery speed and capital exposure.

Total Development Cost (TDC)

The fully loaded cost of delivering the project, including hard costs, soft costs, contingencies, and financing assumptions. It directly impacts yield-on-cost and return metrics.



PSYCHOGRAPHICS

LOW-RISE LIVING – Midscale middle age mostly without kids

- **Age Ranges :** Age <55
- **Presence of Kids :** Mostly w/o Kids
- **Homeownership :** Renters
- **Employment Levels :** Service Mix
- **Education Levels :** Highschool

ASPIRING A-LISTERS – Midscale older mostly without kids

- **Age Ranges :** Age 45–64
- **Presence of Kids :** Mostly w/o Kids
- **Homeownership :** Renters
- **Employment Levels :** Mix
- **Education Levels :** Some College

URBAN ELDERS – Upper midscale older mostly without kids

- **Age Ranges :** Age 45–64
- **Presence of Kids :** Mostly w/o kids
- **Homeownership :** Renters
- **Employment Levels :** Mix
- **Education Levels :** College Graduate

MULTI-CULTI MOSAIC – Midscale younger mostly with kids

- **Age Ranges :** Age 25–44
- **Presence of Kids :** Mostly w/ Kids
- **Homeownership :** Mostly Renters
- **Employment Levels :** Mix
- **Education Levels :** Highschool

THE COSMOPOLITANS – Upscale younger family mix

- **Age Ranges :** Age 25–44
- **Presence of Kids :** Family Mix
- **Homeownership :** Homeowners
- **Employment Levels :** Management and Professional
- **Education Levels :** Graduate Plus

Source: <https://claritas360.claritas.com/mybestsegments/#zipLookup>

LOCAL DRIVERS OF DEMAND

GREEN SPACES

Green-Wood Cemetery Sunset Park

Green-Wood Cemetery is one of Brooklyn's most significant green spaces that functions as a historic landmark and an informal park. Sunset Park is an official nearby park that includes athletic fields, playgrounds and spaces for public gathering. These outdoor spaces strengthen long term demand for the area.

INDUSTRY CITY

Job Growth

With the continued expansion of Industry City, there is growing opportunity for employment in fields like tech, design, manufacturing, and food production. Local job growth drives demand for nearby housing.

PROXIMITY TO TRANSIT

MTA Bus – Route B63, B11 MTA Subway – D, N, R, W Trains

Multiple subway lines along 4th Avenue provide direct access to Downtown Brooklyn and Manhattan. There are also many bus stops near 4th and 5th Avenue that connect with the subway at key transfer points. This can support demands of commuters and residents alike

RELATIVE AFFORDABILITY

Compared to nearby submarkets like Gowanus and Park Slope, this neighborhood in Brooklyn offers more attainable rents. Without the cost premiums that more established neighborhoods have, this area offers more affordable pricing that continues to attract renters, homeowners, and small businesses.

WHAT THE COMMUNITY ENVISIONS FOR THE AREA

COMMUNITY BOARD 7 SUNSET PARK 197-A PLAN ¹

The plan envisions the Sunset Park waterfront and adjacent upland areas as a **sustainable mixed-use** neighborhood that balances industrial, commercial, residential, open space, and waterfront access. It emphasizes development that **promotes economic growth without compromising environmental quality** or the character of existing residential areas.

OVERARCHING GOALS:



The 197-a Plan emphasizes economic revitalization without displacement, the preservation of Sunset Park's **industrial base with flexibility for future adaptation**, improved physical and visual connections between the upland community and the waterfront, and a commitment to inclusive, environmentally responsible, and community-driven planning.

COMMERCIAL NEEDS ASSESSMENT ²

"This commercial district is a great place to be a part of. So many unique shops to go to including new, old, and innovative ones."

KEY COMMUNITY PRIORITIES:



The Commercial District Needs Assessment concludes that Sunset Park is poised to continue evolving as a diverse and vigorous consumer market, driven by its large, immigrant-led population, high residential density, and strong demand for neighborhood-serving retail and services. The study highlights sustained spending on everyday goods, food, health services, and personal care, alongside broad community support for new affordable housing, improved public realm conditions, and investments that enhance quality of life.

Source 1: NYC Department of Housing Preservation & Development Office of Neighborhood Strategies
Source 2: Sunset Park Brooklyn Commercial District Needs Assessment, 2022

CAPITAL MARKETS / FINANCING ASSUMPTIONS

CONSTRUCTION DEBT

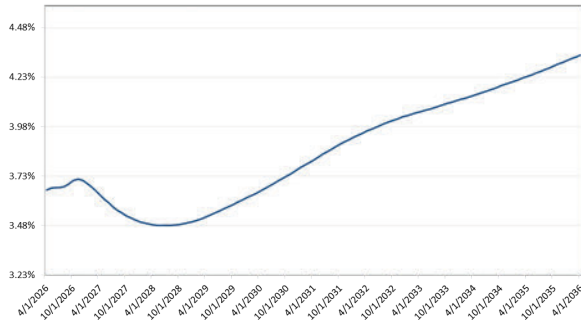


Chart: SOFR 1-Month Forecast from Chatham (as of 4/6/26)

221(D)4 CONSTRUCTION / PERMANENT (FHA)

Term	LTV	DSCR	Amortization	Rates*
40-Year	87%	1.15x	40	5.70- 6.15%

* Before MIP.

Source: [Northmarq](#) (as of 2/11/26)

Additional 221(D)4 loan details:
Fully amortizing for 40 years,
with an interest-only period up
to 3 years during construction;
prevailing wage requirements;
\$4MM min ([reference](#))

PERMANENT DEBT

CURRENT INDEX RATES

Term	Rate
5-Year Treasury	3.69%
7-Year Treasury	3.90%
10-Year Treasury	4.13%
30-Day Avg. SOFR	3.66%

*Rates are subject to change. Please contact your Northmarq representative for the most current rates.

FANNIE MAE - CONVENTIONAL

Term	LTV	DSCR	Spread (bps)	Rate
15-Year	65%	1.35x	105 - 135	5.18% - 5.48%
10-Year	55%	1.55x	95 - 115	5.08% - 5.28%
10-Year	65%	1.35x	105 - 135	5.18% - 5.48%
10-Year	80%	1.25x	125 - 155	5.38% - 5.68%
7-Year	55%	1.55x	105 - 125	4.95% - 5.15%
7-Year	65%	1.35x	115 - 145	5.05% - 5.35%
7-Year	80%	1.25x	140 - 170	5.30% - 5.60%
5-Year	55%	1.55x	110 - 130	4.79% - 4.99%
5-Year	65%	1.35x	120 - 150	5.10% - 5.40%
5-Year	75%	1.25x	155 - 185	5.45% - 5.75%
10 SARM	75%	1.00x	215 - 225	5.81% - 5.91%

* For loans less than \$6MM, please reach out to your Fannie representative.

Source: Northmarq (as of 2/11/26)

The capital market landscape has steadily improved over the last year, as regional and national banks are now offering low-cost construction financing at S + 200-300bps at 65% LTC ([source: Multifamilyhousingnews](#)). In addition, green construction financing options, such as C-PACE, offer additional bridge debt ranging from 5.75-6.25% ([source: Pace Loan Group & NYC Accelerator](#)).

ZONING ANALYSIS – UNDERBUILT SITES MEETING CAPSTONE CRITERIA



~26 Parcels meet the criteria for infill development within the designated area of Greenwood Heights and Sunset Park

Shared Zoning Characteristics

- ≤50% built (many are 30–45% built)
- No city ownership
- No landmark designation
- No religious or income-restricted use
- No DOB major jobs in last 20 years
- No recorded air-rights sales

As-of-Right Development Potential

- **Residential infill or mixed-use (res + local retail)**
- Mid-rise scale consistent with surrounding blocks
- No ULURP or rezoning required
- Height and bulk governed by contextual envelopes, not towers

Relative to Neighborhood Norms

- These sites are **representative**, not exceptional
- Similar underbuilt conditions recur block-to-block
- Indicates **scalable opportunity**, not a one-off anomaly

SOURCES & BIBLIOGRAPHY

Parametric Carbon-Finance Optimization Engine

EMBODIED CARBON BENCHMARKS

1. Lewis, D.J., M. Tsurumaki, and P. Lewis. Manual of Biogenic House Sections. Oro Editions, 2022. ISBN: 978-1-954081-44-8.
2. Hart, J., B. D'Amico, and F. Pomponi. "Whole-Life Embodied Carbon in Multistory Buildings: Steel, Concrete and Timber Structures." *Journal of Industrial Ecology* 25, no. 2 (2021): 403–418. DOI: 10.1111/jiec.13139.
3. Kumar, D., S. Alam, and M. Zhu. "Environmental Impact Assessment of Mass Timber, Steel, and Concrete for Mid-Rise Construction." *Building and Environment* 248 (2024): 111044. DOI: 10.1016/j.buildenv.2024.111044.
4. Hemmati, M., et al. "Comparison of Embodied Carbon Footprint of a Mass Timber Building Structure with a Steel Equivalent." *Buildings* 14, no. 5 (2024): 1276. DOI: 10.3390/buildings14051276.
5. Carbon Leadership Forum. WBLCA Benchmark Study v2. University of Washington, 2023. carbonleadershipforum.org/clf-wblca-v2/.
6. Structural Engineers 2050 (SE 2050). SE 2050 Commitment Program Database. se2050.org.

CONSTRUCTION COST DATA

7. Construction Cost Estimate. <https://www.rlb.com/americas/insights/>.
8. WoodWorks — Wood Products Council. Mass Timber Cost and Design Optimization Guide. WoodWorks, 2023. [woodworks.org](https://www.woodworks.org).
9. Think Wood. Mass Timber Construction Manual: Cost, Schedule, and Design Considerations. Think Wood, 2023. [thinkwood.com](https://www.thinkwood.com).
10. Canada Mortgage and Housing Corporation (CMHC). Mass Timber Construction: Schedule and Cost Advantages for Mid-Rise Residential. CMHC, 2022.

REVENUE & RENT PREMIUM DATA

11. Urban Land Institute (ULI). Biophilic Design and Real Estate Value. ULI, 2022. knowledge.uli.org.
12. CBRE Research. The Mass Timber Premium: Tenant Demand and Rental Performance in Commercial Real Estate. CBRE, 2023.
13. International WELL Building Institute. The Business Case for Healthy Buildings: A Global Review of the Evidence. IWBI, 2023. resources.wellcertified.com.
14. Hines and DLR Group. T3 Minneapolis: Performance Case Study — First Modern Mass Timber Office Building in the United States. Hines, 2020.

OPTIMIZATION METHODOLOGY

21. Makki, M., M. Showkatbakhsh, and Y. Song. "Wallacei: An Evolutionary and Analytic Engine for Grasshopper 3D." Version 2.7. Wallacei Ltd., 2019. wallacei.com.
22. Deb, K., A. Pratap, S. Agarwal, and T. Meyarivan. "A Fast and Elitist Multiobjective Genetic Algorithm: NSGA-II." *IEEE Transactions on Evolutionary Computation* 6, no. 2 (2002): 182–197. DOI: 10.1109/4235.996017.

PREFABRICATION

23. Smith, R.E., and J.D. Quale. *Offsite Architecture: Constructing the Future*. Routledge, 2017. ISBN: 978-1-138-82116-7.
24. McKinsey & Company. *Modular Construction: From Projects to Products*. McKinsey Global Institute, June 2019. [mckinsey.com](https://www.mckinsey.com).

ENERGY & OPERATIONAL CARBON

15. ASHRAE. ANSI/ASHRAE/IES Standard 90.1-2022: Energy Standard for Sites and Buildings. ASHRAE, 2022.
16. NYC Mayor's Office of Climate and Environmental Justice. Local Law 97 of 2019: Building Emissions Limits — Implementation Rules. City of New York, 2024. nyc.gov/l97.
17. U.S. Department of Energy. Commercial Prototype Building Models: Midrise Apartment. DOE, 2023. energycodes.gov/prototype-building-models.

FINANCIAL ASSUMPTIONS

18. Confidential developer interviews, 2025–2026. Brooklyn-based residential development firms (names withheld per NDA).
19. Passive House Institute US (PHIUS). PHIUS 2024 Cost Study: Incremental Costs for Passive House Multifamily Buildings. PHIUS, 2023. phius.org/research.
20. NYC Rent Guidelines Board. 2025 Housing Supply Report. NYC RGB, 2025. rentguidelinesboard.cityofnewyork.us.

