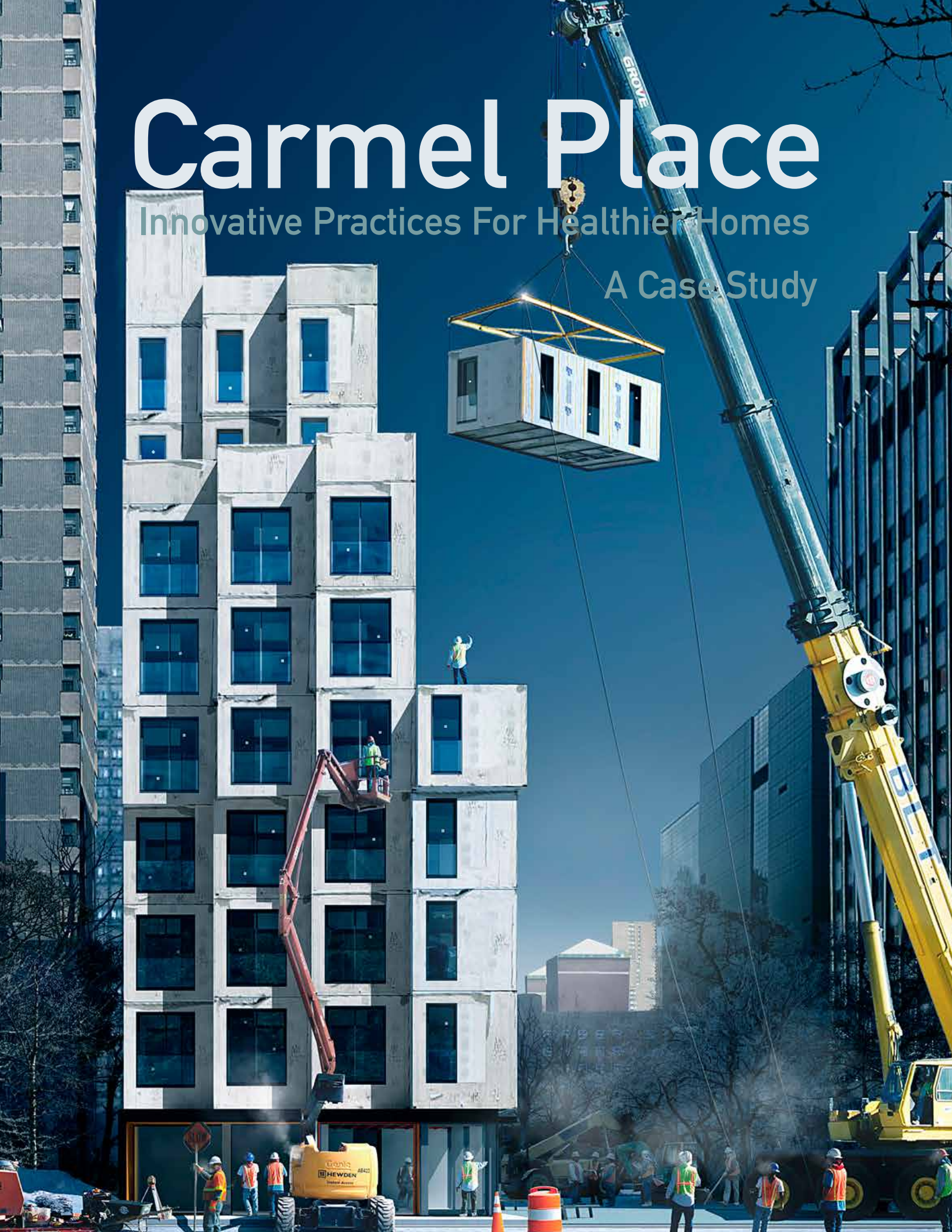


# Carmel Place

Innovative Practices For Healthier Homes

A Case Study



## Acknowledgments

### Project Team

LESPMHA - Lower East Side People's Mutual Housing Association  
Monadnock Development LLC  
Monadnock Construction inc.  
nARCHITECTS

For a full list of contributors, please refer to page 75. Without their generous contribution, this work would not have been possible. Many Thanks.

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This study was completed in Feb 2019



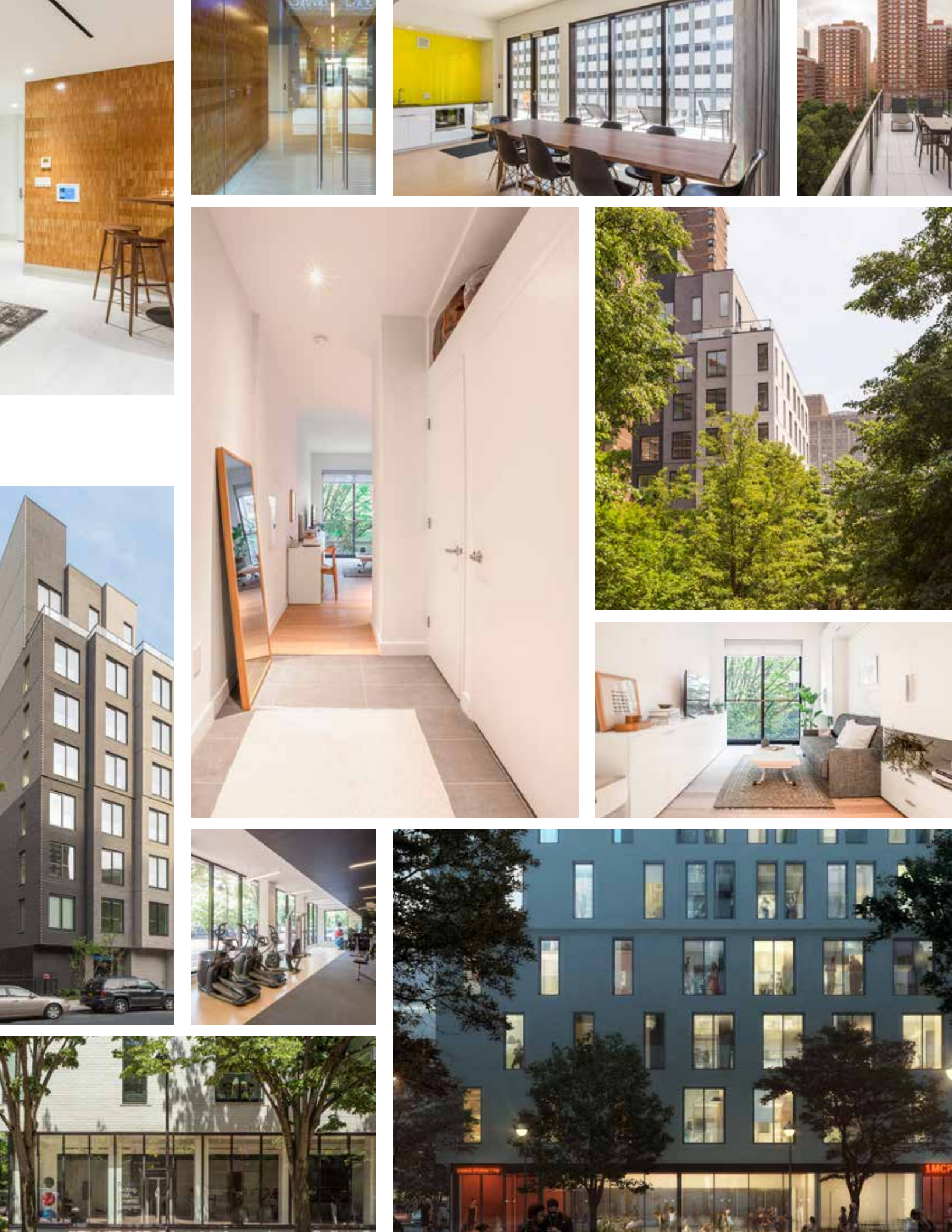
# Carmel Place

Innovative practices for Healthier Homes

## A Case Study

New York, NY  
Monadnock + Lower East Side People's Housing Association  
Opened June 2016





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SECTION 1

# INTRODUCTION TO CASE STUDY METHODOLOGY

This report is one of a series of five case studies initiated by Healthy Materials Lab at Parsons School of Design to record systems of processes and decision-making that go into the building of new affordable housing developments across the United States. Healthy Materials Lab team of researchers examine developments that incorporate healthier building products and developers that have a stated mission to transform and advocate for change in standard building practices within the affordable housing industry.

According to research by the Environmental Protection Agency, residents and building occupants in the United States spend more than ninety percent of their time indoors, and are therefore very vulnerable to health hazards posed by the products used to construct their interior environments. This includes increased cases of asthma and cancer, along with developmental and reproductive health issues. The health risks are particularly high for children, pregnant women, and people living in poverty.

Toxic chemicals are used in building products for many reasons, including performance, maintenance, and low cost. The regulation of chemical use in building products is within the purview of the Toxic Substances Control Act, which has been mostly ineffective in chemical oversight. As a result, many widely used interior building products may cause unintended chemical exposure for building occupants. The challenge for all of us working in the affordable housing sector is to find healthier affordable building product alternatives.

Ultimately, these case studies and research have the potential to impact the housing sector as a whole by demonstrating the health benefits associated with using healthier products for residents, staff, and visitors, thus creating more demand for these products.

The systems-thinking methodology used in our case studies interrogates quantitative and qualitative factors through a series of research methods such as stakeholder interviews, videography, photography, analytical mapping, diagramming, media coverage, stakeholder analysis, and a review of current census and other such data sources. This gives us an understanding of how, why, and when building product decisions are made establishing a current baseline of best practices for healthier buildings within the affordable housing industry.

The regional distribution of these case studies across the United States helps us recognize the key local influences

and obstacles in the process of healthier building construction. This enables a critical analysis of the current processes of funding, design, and construction within the affordable housing sector in each locality and highlights the challenges, and compromises that take place when procuring and installing these building products.

Through these case studies, an examination of existing benchmarks and certifications within the industry becomes possible. The Living Building Challenge, LEED, Enterprise Green Communities Criteria, Delos® Well Build, and state policies that promote better building practices can be studied within the context of affordability to analyze their accessibility, feasibility, and replicability.

Other building market sectors have larger budgets, which allow for the procurement of healthier products that are often associated with higher premiums. The affordable housing sector, on the other hand, is subject to restricted budgets that often result in the installation of inexpensive construction products that can contain toxic chemicals. Highlighting the innovative approaches that developer teams have utilized to achieve healthier affordable housing despite all these constraints, helps set a precedent for others to do so as well.

Additionally, this provides a list of existing affordable healthy building products that can be shared and analyzed. This list is currently contributing to the making of a library of better building products to be showcased in many contexts, including the Donghia healthier Materials Library at Parsons School of Design, The New School. Finally, this methodology can allow for other evaluation tools used by designers nationwide to be collected and shared, easing the specification process and paving the road to innovation through collaborative practices.

These reports intend to share a range of resources that will support the transformation of construction practices in the affordable housing sector in order to create healthier housing for all people. Our case study research will be disseminated through various channels, including written reports, short films, and animations. The aim is to target a wide audience by communicating difficult and complex topics in a widely accessible manner. Healthy Materials Lab initiated the case study of Carmel Place at Parsons School of Design with contributions from Monadnock Development, nARCHITECTS, and Monadnock Construction in New York City in November 2015. Supported by a grant from The JPB Foundation, this case study is part of the Healthy Affordable Materials Project.



Cover page: Elevation of Carmel Place Development  
p. 4: Photographic montage of the Construction and opening day of the development  
Left: Regional Distribution of the Case Studies



## SECTION 2

## HOUSING IN NEW YORK CITY

## 2a. The History of Housing

To comprehend the context of Carmel Place, an in-depth understanding of New York City's housing history and current scenario is essential.

With a population of 8.62 million, New York City is the largest metropolis in the United States, outpacing the next most densely populated city in the country, Los Angeles, by more than a 2-to-1 ratio. NYC real estate, particularly residential property, is regarded as one of the more remarkable aspects of New York City life. The City has struggled with significant housing challenges throughout its history, with affordability consistently being a vital issue for residents, policymakers, and other stakeholders.

In the late 1800s and early 1900s, comfort and safety were central issues in the struggle for housing reform, as revealed by the photography of Jacob Riis in *How the Other Half Lives*, his exposé of living conditions in low-income tenement buildings on the Lower East Side of Manhattan. His work was instrumental in inspiring legislators to institute the New York State Tenement House Act of 1901 which ensured that new buildings have outward-facing windows, indoor bathrooms, proper ventilation, and fire safeguards. This was a time when, apart from a small number of families in low-cost philanthropic endeavors, New Yorkers were entirely beholden to market forces without any government assistance or rental protections in place.

In the past one hundred and fifty years, the City's population has increased by more than tenfold, and today we face an unprecedented crisis in the availability of low-income housing. Confronted with a combination of demands, including economic recessions, limited buildable land, and increased homelessness, the current crisis cannot simply be understood as a housing crisis, but as a crisis of poverty.

The Brookings Institute identifies low-income status as a dependent factor that is frequently related to five dimensions of disadvantage: low household income, lack of employment, limited education, lack of health insurance, and living in a poor area. According to a report issued by the institute, "16 percent of the working-age adult population in the United States—more than 24.4 million people—not only struggle with low incomes but also face at least one additional disadvantage. Millions experience three or four of these challenges at the same time" (Kneebone and Reeves, 2016). Securing affordable housing is only one struggle facing many New Yorkers, but it is the one that can negatively impact all four of the other dimensions of disadvantage.

New York City is an unceasingly expanding city, attracting professionals, students, and workers from across the country and the world. In 2007, Mayor Bloomberg's administration formulated a strategy titled PlaNYC to address New York City's long-term challenges, including a predicted population increase to 9.1 million residents in 2030 (note: by 2015 we had already reached the 2020 projections of 8.5 million). The PlaNYC goals were to strengthen the economy, combat climate change, and enhance the quality of life for all New Yorkers, with housing being one of its ten target areas of interest.

Inspired by the projected spike in population, the Citizens Housing and Planning Council (CHPC)—a research and education organization which has been working to advance practical public policies in support of New York City's housing and neighborhoods—created a research initiative called Making Room. Making Room focused on examining the current living situations in various types of households, including ad hoc living arrangements born out of financial necessity. Their goal was to devise solutions as to how the City's housing stock could accommodate the evolution of inhabitation in New York City and its increasing population. In response to this research, the NYC Department of Housing Preservation and Development (HPD) launched adAPT NYC in July 2012 as a pilot program to develop a new typology of housing to adapt to the City's changing demographics.

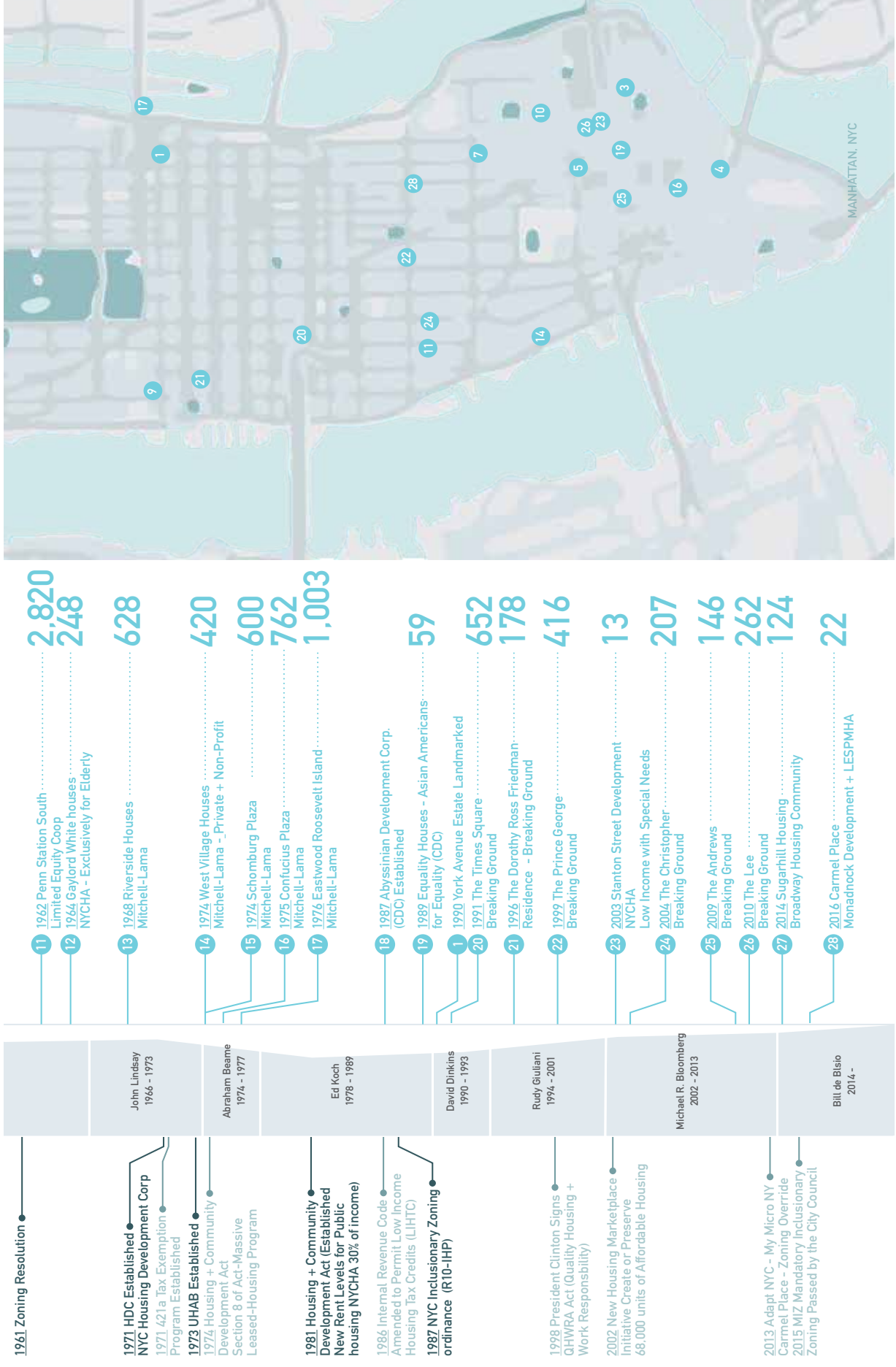
Creating "a new typology" of housing is an onerous task. Housing regulations formulated at the beginning of the 20th century to improve health and safety need revision to suit the 21st-century household and its living conditions. Existing regulations make it illegal for more than three unrelated adults to live together. According to studies conducted by CHPC, "at least 250,000 New Yorkers are estimated to be sharing housing in some informal or illegal way" (Perine and Watson, 2011). With no precise figures for the underground market of illegal housing rentals, we can deduce that this figure is a conservative estimate. In addition, people living alone occupy 33 percent of housing units in New York City and 46 percent of those in Manhattan. Allowing more spaces to exist legally that either allow for single residents to live alone or to share spaces seems a progressive and timely goal.

Left: Aerial View of Carmel Place set in Kips Bay



1900 Manhattan Population  
3.437 million

HOUSING UNITS



2014 Manhattan Population  
8.4911 million

26,305 Total Housing Units



2b. Why Carmel Place?

Carmel Place is a mixed-income, micro-unit housing development built by Monadnock Construction and Lower East Side People’s Mutual Housing Association. This development located in the vibrant neighborhood of Kips Bay, Manhattan addresses the need for income-targeted apartments, with 40 percent, or 22 of 55 units, designated as affordable. Of those 22 units, eight are allocated to formerly homeless veterans, and the remainder is to be allocated through a lottery. Affordability, in this context, means 11 units are available at 80% Area Median Income, or AMI (\$48,400 for an individual, \$55,280 for a two-person household), 5 at 145% AMI (\$87,725/\$100,195), and 6 at 155% AMI (\$93,775/\$107,105). The AMI is the income earned by a family right in the middle of an income group. This metric divides the data; half of the families earn more, and the other half earn less.

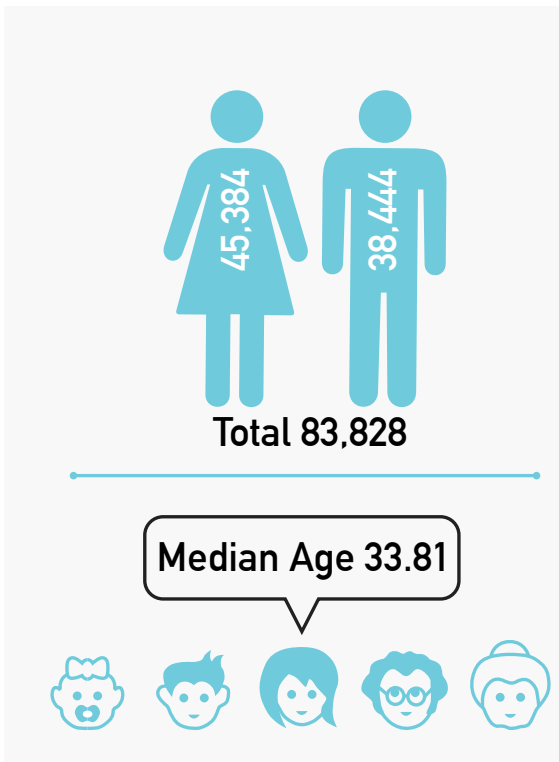
When the Jacob Riis Houses (NYCHA) on the Lower East Side of Manhattan opened in 1949, there were more than 13,000 applicants for the 1,768 units. In 1984,15,000 households submitted applications for 208 units in Bedford-Stuyvesant. In 2015, Carmel Place had 60,000 applications for the 14 available apartments, which computes to approximately 4,250 applicants per apartment. The New York Times reported in 2011 that “competition [for affordable apartments] is fierce, with as many as 10,000 applications pouring in for every 100 available apartments.” In the space of only four years, demand had become much more fierce and continues to do so, which speaks to the critical state of affordable housing availability in New York City. As of May 2016, HPD confirmed that there were 2,626 affordable apartments available with 2.54 M applications.

Responding to all of the challenges the City of New York faces, Carmel Place is ingenious in many ways. This unique all-micro-unit development project is the first multi-family building in Manhattan built using modular construction, the only housing development in New York City to have secured a zoning override which allows for the construction of apartments under 400 sqft, and the first micro-unit development in New York City targeted at individuals and couples. Carmel Place was

“How great would it be for a nurse who lives by themselves in Queens to be able to live close to their work.”

Bea De La Torre formerly HPD

also designed to achieve LEED silver status, and adhered to the Enterprise Green Communities Criteria (EGCC) (2011). Several zoning regulations needed to be waived for the development to be realized as outlined in the adAPT NYC Request For Proposals (RFP), issued on July 9th, 2012. The changes to the zoning, which can only happen on City-owned land, override the constraints on the size and density of the building and its units, allowing for more units to be built. As a result, more residents for whom market-rate rentals would be unattainable could be housed through the creation of more affordable units. Before the mayoral override, only 38 units could have been built on this site, as opposed to the 55 that were secured. With current high land and construction costs in New York City, for a project such as this to be financially viable, a developer would typically limit themselves to the luxury market and the creation of larger, more expensive apartments. The demand to provide as many affordable units as possible in a development is an issue of economics, as well as an ongoing challenge to managing costs throughout construction. While the construction costs associated with a modular building is not any lower than that of traditional construction, the time saved by building within a controlled environment can lead to labor cost savings.

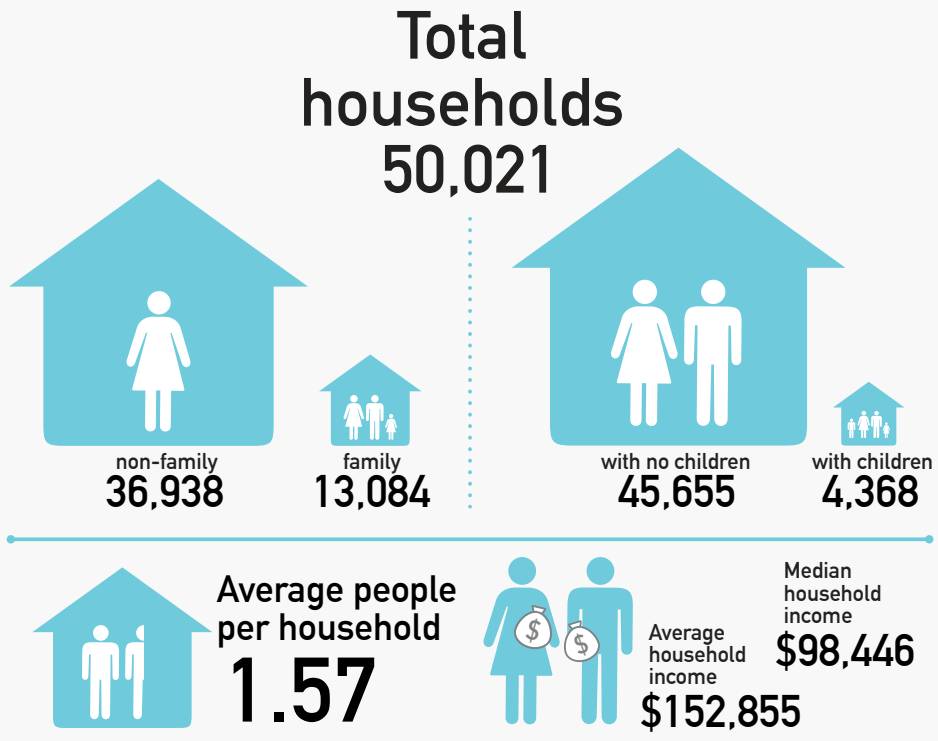


Left: Family Profile in Manhattan and Household Data  
Right: Age and Gender Divide in NYC

Though healthier building material choices were not included as a part of the RFP for Carmel Place, the project did use a collection of products and materials that were guided by aesthetics, durability, and LEED and EGCC certifications. This led to better, healthier alternatives to some more typical specifications. The innovative nature of this project, and its potential to signal a new typology of housing, identify Carmel Place an ideal case study for New York City. It also provides an opportunity to compare the materials that were used in this project to those used in other developments elsewhere that actively pursue the inclusion of healthier building materials.

Kips Bay, where Carmel Place is located, has a long association with health and healing. Bellevue Hospital, which sits directly to the east of Carmel Place, is the oldest public hospital in the United States. It was founded in 1736 as an almshouse for the City’s poor and continues to serve underprivileged populations, with 80 percent of its patients being medically under served city residents. Three blocks south of Carmel Place, at 23rd Street and 1st Avenue, is the Manhattan campus of the Veterans Affairs Hospital, which is an essential resource for the residents of the eight units at Carmel Place designated for formerly homeless veterans. The site’s

proximity to public transportation and local healthcare institutions was a critical factor for HPD. HPD wanted to be able to accommodate some of the workers from the nearby healthcare facilities so that they could have an opportunity to live close to their work, which would have been otherwise prohibitive at market-rate rents.



## SECTION 3

## ABOUT CARMEL PLACE

## 3a. The Context of Carmel Place

Carmel Place is located just off Manhattan's main east side thoroughfare of First Avenue which offers the most direct route from downtown Manhattan to uptown, the Bronx and Queens. Positioned on 27th street between Mount Carmel Place, a two-block street joining 28th and 26th streets, and First Avenue.

Flanked by large residential and institutional towers in the vicinity, most notably the NYCHA development at 344 East 28th Street, with which it shares the same block (Manhattan block 933) and to the south, the Department of Health's Public Health Laboratory. Facing west Carmel Place overlooks a public park, Bellevue Park South. The site was formerly a City-owned car park which was unofficially used by NYCHA workers, and residents and its appropriation in itself became a point of contention during the community review process.

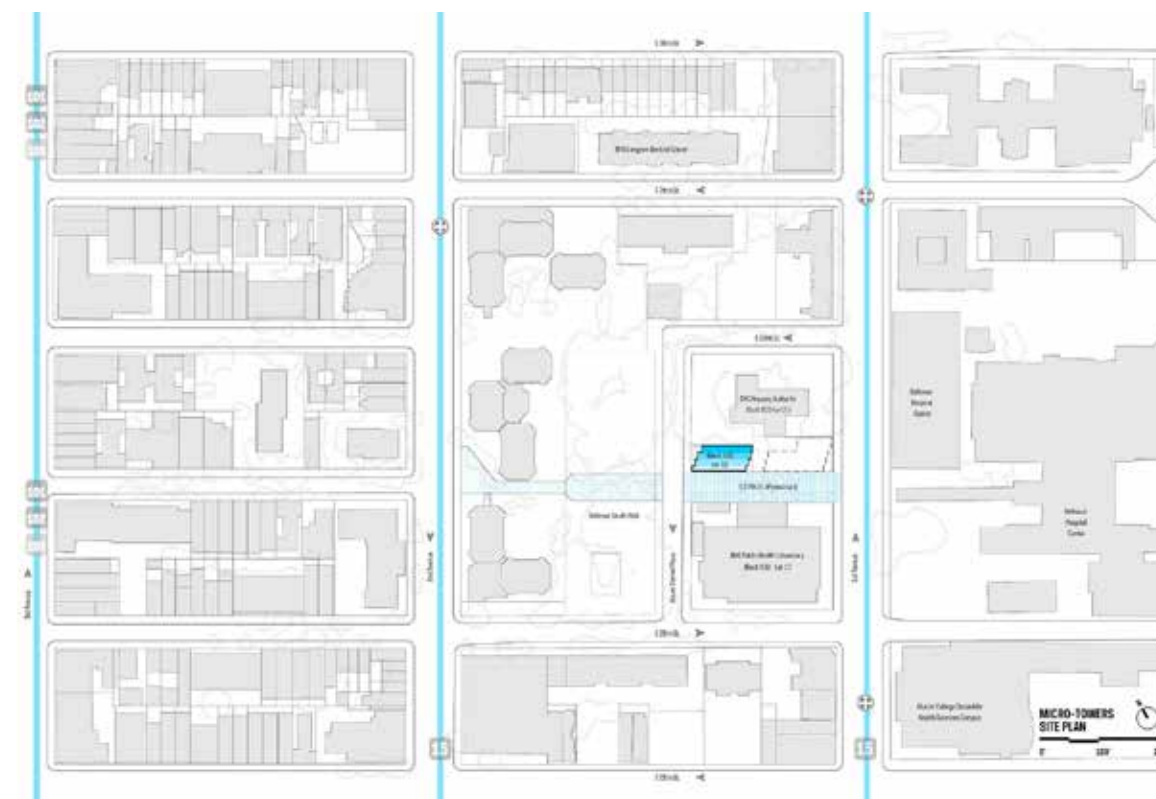
There is a strong presence of medical facilities along this stretch of First Avenue with emergency and acute care at Bellevue, NYU Langone medical center general hospital, the teaching schools of medicine and dentistry for Hunter

College and NYU, and the VA hospital on 23rd Street. These institutions combined with the First Avenue traffic make for a loud and industrious neighborhood.

District 2 has 20,140 rent-stabilized units, having suffered a 22 percent loss since 2007 (I Quant NY, 2015). While there has been an overall decrease in Manhattan's rent-stabilized units of 11 percent, the district ranks 4th in losing units in NYC. Despite gains, it is important to note that the district is still losing units much faster than they can be replaced and increases in rent-stabilized units from new construction are only temporarily affordable.

This particular pocket of Manhattan is anomalous to the rest of its Kips Bay neighborhood with a cross-section of groups—hospital workers, low-income residents, young professionals and mental health and substance abuse patients from the Bellevue facility, all cutting across 27th street and Bellevue Park South to access the subway and more opportunities for restaurants and shopping.

The primary criterion in choosing this site was that



Left: Entrance of Carmel place

Right: Context Carmel Place














the land needed to be City-owned in order to engage with the legal framework of zoning resolutions to allow development of micro-units. It was also essential that it be a site where residents would have access to public transport. The City looked at properties in Brooklyn, but any site in New York City above and beyond 96th street in Manhattan requires the provision of car parking, this obligation reduces the number of units, specifically affordable units, that can be built on a given site.

The site brought its own set of challenges, particularly in the context of modular construction as the lot size is 45' x 105' a total of 4725 sqft with the building footprint absorbing 3843 sqft of that area. This space allowed little storage for materials and none for the modules, which were delivered by truck, overnight with only the number of modules that could be erected the following work day.

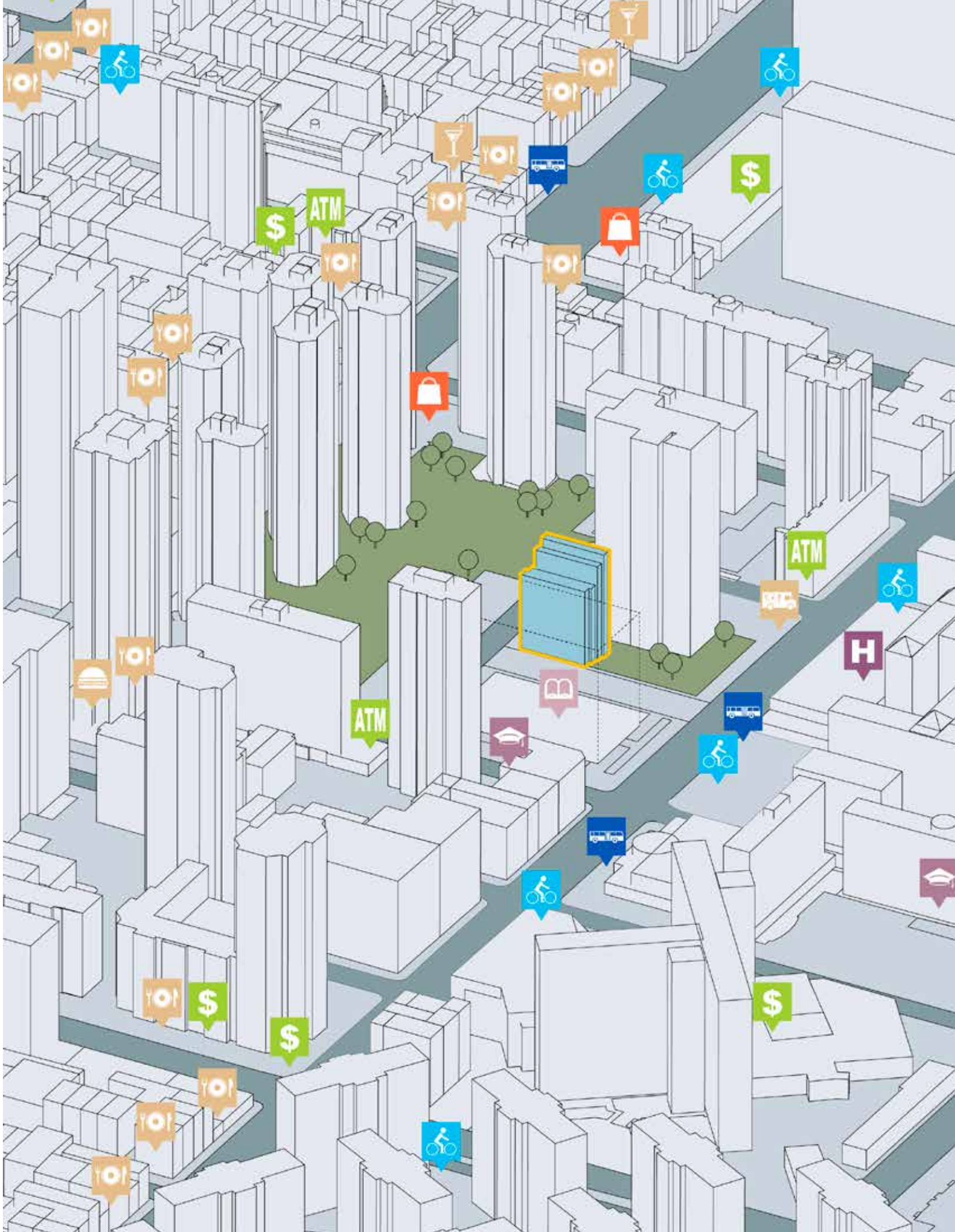
Carmel Place is a mixed-income rental building with forty percent affordable to a range of incomes, from low-income to middle-income households, each unit having a maximum of two tenants. The terms of the affordability agreement for the Mayor's office is that all of the eleven affordable units would be entered into Rent Regulation and registered with New York State Homes and Community Renewal (HCR) as per a thirty-year regulatory agreement. In order to make the affordable units permanently affordable, the developer is contractually obliged to see an extended Article XI tax exemption, or equivalent, for when the initial 421-a exemption expires in twenty years. Article XI will provide an additional forty years of tax-exempt status to the affordable units. Eight of the units receive project-based vouchers, utilized under the Veterans Affairs Supported Housing (VASH) program. Renting the affordable housing units through NYC Housing Connect, the source to find and apply for affordable units in the five boroughs. It is the one-stop-shop of affordable apartments as it features all units in the City regardless of being in all-affordable developments or mixed buildings. In all of the developments a percentage of units are set aside for different applicants, residents of the community board that the development resides in (50%), those with disabilities (5% mobility and 2% vision or hearing) and municipal employees (5%) the City also included a 25 percent preference for NYCHA residents, including but not limited to the 50 percent preference for Manhattan Community Board 6. Marketing of the apartments and the application process for the lottery typically begins when construction is approximately 70 percent complete. As of mid-June 2016, there were 1060

units, from studios to three-bedroom, available at varying degrees of affordability within the City, of those 257 were available in Manhattan. One of those developments with 55 units, owned by the non-profit Phipps Housing, is two blocks, directly south of Carmel Place but with studios starting at \$1,715/month—in contrast to Carmel Place's \$950, excluding those dedicated to the formerly homeless veterans— it qualifies more as middle income (affordable) housing.

LEGEND

-  Bars and Clubs
-  Bus Stops
-  Banks
-  Restaurants
-  ATMs
-  Fast Food Joints
-  Retail Stores
-  Cycle Access/ Parking
-  Library
-  Universities/ Schools1
-  Hospitals

Right: Services Adjacent to Carmel Place







### 3b. Modular Construction of Carmel Place

Construction of Carmel Place consisted of fabrication, transportation and stacking of 65 individual steel framed modules, of which 10 units form the building core and the remaining 55 are the as residential micro-unit. Following the on-site construction of the foundation and ground floor, the rest of completed modules were transported and stacked on top. These modules were constructed locally in the Brooklyn Navy Yard at the Capsys factory. They were designed there ready for installation of appliances and interior finishes. Dividing the construction process reduced on-site construction

noise and neighborhood disruption, while the controlled environment of the factory allowed the team to control quality and maintain critical interior dimensions. The reduction in on-site construction brings in some reduction in the cost of the building itself.

In addition to being the first micro-unit apartment building in New York City, Carmel Place is – at the time of writing – the tallest modular building in Manhattan, and one of the first multi-unit Manhattan buildings using modular construction.



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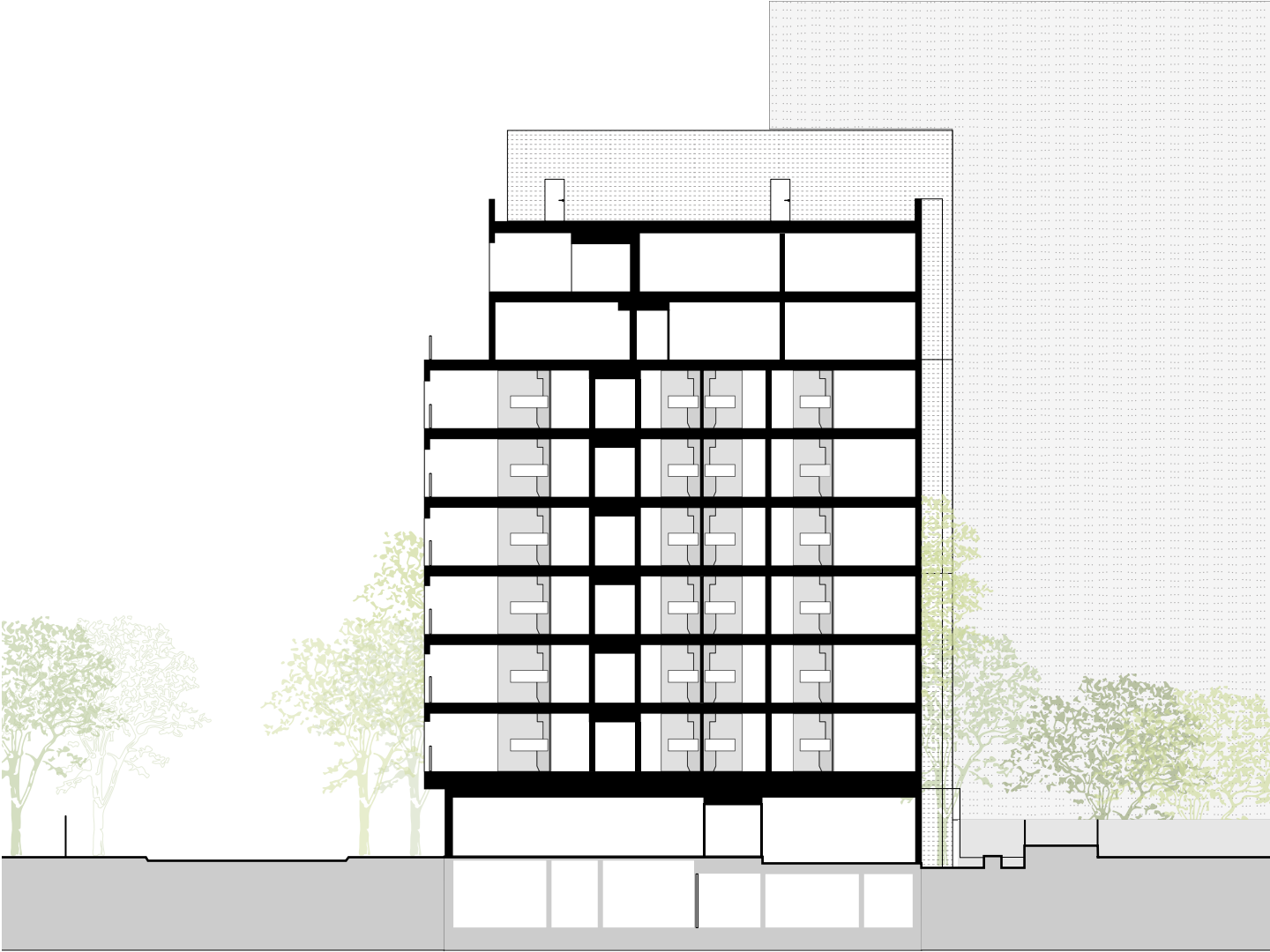


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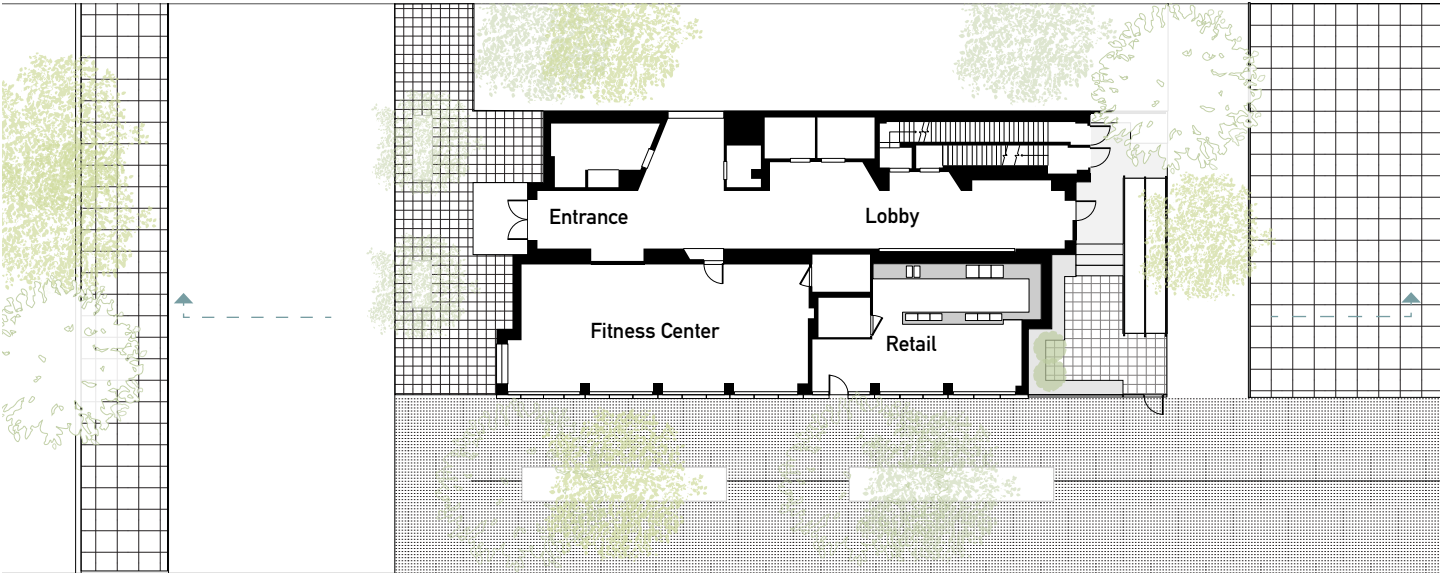


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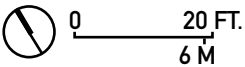




Section



First Floor Plan



3c. Architectural Planning of Carmel Place

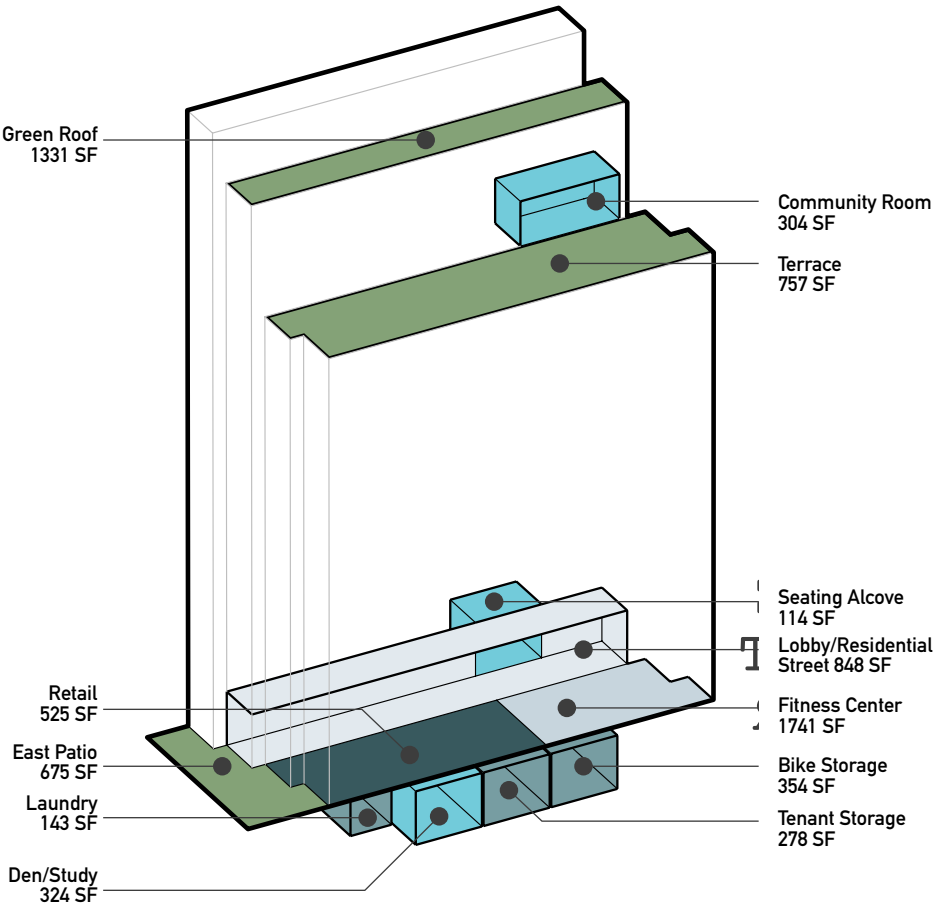
Designed as replicable and scalable new model for housing in NYC, the architects conceived Carmel Place as a microcosm of the city skyline. The building’s exterior resembles four slender “mini towers” that connect the concept of micro-living to the form and identity of the building.

The building is designed to provide an open social structure with inclusive community spaces such as the green roof, community room for gatherings, a reasonably spacious terrace, and a fitness center. The idea was to make it more than a affordable building housing individual units. The “mini towers” that are 11 foot wide reflect this goal by celebrating the beauty of small dimensions, while not highlighting individual micro-units on the facade. The colors used for the building’s exterior make connections to the project’s local context.

The open communal amenities are accessible to all residents of Carmel place. The spaces are designed to

serve a variety of functions and are located centrally, enhancing the tenants’ active connection to the community. A spacious and well-lit lobby connects Mt Carmel Place’s sidewalk on the west to an exterior resident porch on the east. Conceived as an interior street that is flexible space, this space could be used to host community events.

In addition to containing public spaces with built-in seating, the lobby opens to a large street-level and fully glazed gym that fronts the pedestrian 27th street and adjacent park. In the cellar, residents have access to a den, storage, bike storage, and laundry, while at the 8th floor, a community room with a pantry leads onto a public roof terrace with sweeping city views. Spaces typical of a home are dispersed throughout the building, thereby encouraging residents to interact with their neighbors throughout their daily routine.



Left: First Floor Plan and Section Carmel Place  
Right: Community Space in Carmel Place

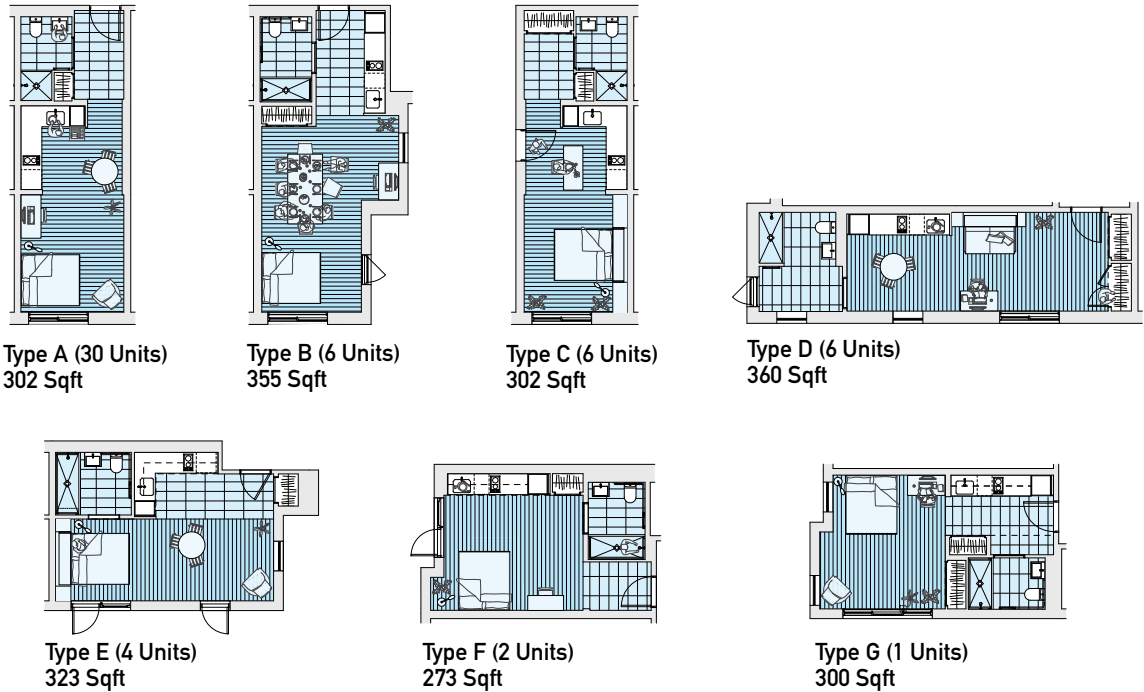
### 3d. Unit Interior Planning

Of the 55 rental residential micro-units, in Carmel Place-22 are marked as affordable housing units, of which 8 are Section 8 – reserved for formerly homeless US veterans (these apartments will be provided with complementary integrated furniture). The 33 market rate units have the option of including furniture and concierge services. The remaining 14 affordable housing units at Carmel Place saw a huge demand with over 60,000 applicants in 2016 after the completion of their model unit.

nARCHITECTS’ design goals for the unit interiors was to achieve a sense of spaciousness, comfort and efficiency, even while shrinking their footprint. To achieve this goal, the architect-developer team increased the size of everything except the floor area: 9’-8” ceilings result in a volume that is close to or exceeds that of a regulation 400sf apartment, which, coupled with the abundant daylight made possible by 8’ tall sliding windows and balconies, maximize the perceived volume of space. Extra storage space is located in the added height above

the bathrooms. nARCHITECTS also worked with Resource Furniture to source flexible built-in furnishings that integrate storage, couch and bed into the layout of almost half of the units (including those dedicated to veteran’s housing). Additional furnishings were provided by Stage 3 Properties through Ollie, an all-inclusive living solution that provides residents with furnishings and amenities. The building’s five basic micro-unit types vary in size and configuration, thereby broadening the spectrum of choice for small family households.

The building’s 8’ tall windows, placed in apartments, corridors and stairs, recall proportions used in New York’s 19th century brownstones, one of the architect’s references for the building’s interior proportions.



8’ tall windows with 9’ 8” high ceiling maximizes the perceived volume of space in the apartment

Left: Different Unit Typologies-Plans  
Right: Images of Type A Housing Unit





3e. General Overview Carmel Place

Location

335 E  
27th Street,  
Kips Bay,  
Manhattan,  
NY

6

Community  
District

Zoning

R8/C2-5  
Overlay

Override to  
Increase Dendity

Typology

Micro Apartments

92 Modules  
2 Weeks to Erect

Rental  
housing

Number of Users

110  
max

Number of units

55

Occupant type:

22 Affordable Units  
14 Lottery  
8 Formerly Homeless  
Veterrans

33 Market Rate

Building

4  
Towers

10  
Floors

Tallest Modular  
Building  
in Manhattan

Site Area

4,725 sq ft

FAR

6-02

Building Footprint

3,843 sq ft

Lot Coverage

(80%)

Interior Lot Area

225 sq ft

Corner Lot Area

4,500 sq ft

Gross Building Area

29,000 sq ft

Residential Building Area

30,018 sq ft

Exterior Space

3,525 sq ft

Interior Amenities

5,470 sq ft

Microunit

260 - 360 sq ft

per Unit / 9' 10" ceiling

Volume

10% < Standard 400 sq ft with 8' ceiling

Total Floor Area

28,239 sq ft

Residential: 27, 561 sq ft  
Commercial: 678 sq ft  
Parking: 0 sq ft

Bicycle Parking Spaces

28

1<sup>st</sup>  
NYC  
Microunit  
Apartment  
Building

NYC Council  
District

2

25

The green roof and a reasonably spacious terrace provide a open social structure within this Affordable Housing Structure.

Right: Community spaces in Carmel place. Images of the Eighth floor common terrace.





3f. Lessons Learned

Innovation

- Not relying on typical materials for affordable housing but focusing on aesthetics and durability (within the job’s budget) which in turn resulted in healthier choices
- City led pilot program to explore a viable option for a new typology of housing that could be replicated to maximize the affordable units in the city.
- Reduced apartment size but added a variety of communal spaces to support living in a small space
- Focus on health regarding light and air by installing high ceilings with large operable windows
- The design of the development not limited by working with modular units, the architects approached the design of this building as they would any other not just stacking the module one on top of the other.
- The volume of units is only 10 percent less than a standard 400 sqft. Apartment with 8’ ceiling
- Choice of modular units allows for higher quality control of the units at the fabrication site and a safer work environment.
- If the lot was larger, the prefabricated units could have been stored on site to maximize the efficiency of construction.

Strong Relationships +Partnerships

- A strong collaborative relationship between all of the stakeholders because of the nature of modular construction from the on-site of the project
- Close working relationship between the City (NYC HPD) and housing advocacy group CHPC using their resources and expertize to think about the future of housing and in turn, share that with the City
- Relationships between different groups involved in the creation of housing in NYC as illustrated in the board of CHPC with its 90 members from all areas of housing development and construction including two members from Monadnock Development and one from resource furniture.

Zoning and Leadership in Policy

- Zoning regulations last updated 55 years ago in 1961, don’t adequately reflect the current needs of the city, its households and living conditions.
- New York City as a pioneer in housing policy with the first tenement laws, comprehensive zoning ordinance and public housing project is a leader in the nation regarding policy, with other major cities referring to practices here to guide their development.
- Other high-cost, high-density cities are also assessing the concept of micro-unit apartments to provide smaller and less expensive housing options.
- Zoning overrides made it possible to build 55 units instead of 38 with current ordinances which is critical to the creation of affordable units.

Financing

- AMI does not accurately reflect the demographics of each city neighborhood or borough; this metric is currently excluding the extremely low-income, low-income and working poor of many districts in NYC.
- The expiry of tax-exemption 421-a has caused a slowdown in requests for permits and the development of affordable housing.

Broader Understanding of Community

- Government and Community leaders were working together to advocate for the maximum number of affordable units in the development.
- Council Member Mendez championing of formerly homeless veterans to be allocated 8 of the 22 affordable apartments and be within walking distance of the VA hospital.
- Living on your own doesn’t mean being alone multiple communal spaces designed throughout the building providing opportunities for residents and guests to socialize

Broader understanding of Health

- City to identify existing opportunities adjacent to sites which can be maximized for the health benefits of the residents as with Bellvue Park South a dedicated neighborhood gathering point with playground, exercise stations, volleyball and basketball courts
- The architect’s mindset of designing spaces to allow small households to live together more efficiently and healthily rather than focus on square footage.
- Modular units with their double-walls, ceilings, and floors have enhanced the acoustical performance of traditional units which translates to health benefits particularly in a dense urban neighborhood.



SECTION 4

# INCOME-TARGETED HOUSING IN NEW YORK CITY

A critical part of this case study and the greatest challenge of this debate is to understand what affordability means. While it is important to have an understanding of the expression “affordable housing,” it is essential to be aware of its meaning within the different contexts of cities, neighborhoods and income levels. The common question is “affordable for whom?” when discussions arise around affordability. Sarah Watson, deputy director of CHPC, prefers to use the term “income targeted, subsidized housing,” which is a more helpful way of indicating different levels of affordability, it could also be simply put as “below market rate.” The rule of thumb in the U.S., used as an indicator of assessing affordability, is a family spending no more than 30 percent of their income on living costs (rent and utilities). With varying income levels (extremely low income, very low income, moderate income, middle income, and high income) 30 percent of each of these can be vastly different. In a country where wages have remained stagnant since the 1990s and in a

2019

\$15/hr

NYC Minimum Wage

\$1,850/month

Average 1 Bedroom Apartment Rent in NYC

102 hrs/week

Work Hours needed to afford 1 Bedroom in NYC

30 % of income goes to housing

Income Targeted Housing is Necessary

The Market Excludes Low income residents Because of

> Increasing Demand for Housing

> Rising Land Prices

> High Cost of Construction

City where rents have increased by as much as 75 percent since 2002—a rise of 31 points greater than the rest of the country—this measure, which has been in place for the past 35 years, inadequately reflects the needs of the City’s current residents. Affordable housing in New York City relies on government involvement to plug the gaps of the financial proforma so that low-income groups can be reached. Government intervention, through tax breaks and funding, requires a provision for long-term affordability, up to 30 years, which currently can be renegotiated or allowed lapse on expiry.

Most New Yorkers live in multi-family rental housing rather than owning homes. According to the 2014 Housing and Vacancy Survey (HVS), rental units comprise 64.2 percent of New York City’s available housing stock, 76 percent more than the proportion of rental units in the nation as a whole. New York City in 2014 had a total of 3,400,093 housing units, the largest housing stock since the first HVS was conducted in 1965. New York City’s housing is not only dominated by the size of its rental housing stock but unlike most cities, the bulk of rental units are rent regulated. Of the 2,184,297 occupied and vacant rental units reported in the most recent HVS, 38.9 percent were unregulated, or “free market.” The remaining units were rent regulated. The HVS also found a citywide vacancy rate of 3.45 percent in 2014, below the 5 percent threshold required for rent regulation to continue under State law.

Income-targeted housing is an incredibly important piece of the fabric of New York City, with one of the most expensive housing markets in the country, it is under tremendous pressure, derived from an increasing demand for housing combined with rising land prices and the high cost of construction. The minimum wage in New York City in 2015 was \$8.75/hr. Working at minimum wage one would have to work 98 hours a week to afford an average one bedroom apartment with an approximate rent of \$1,100/month. Currently, a 400 sqft apartment in Kips Bay rents from \$2,500/month. While all aspects of housing are challenging in these conditions, catering to the working poor is particularly taxing when the infrastructure of public housing itself is overburdened from huge deficits, reduced financing and fewer tax exemptions for the construction of new developments.

Across the Affordable sector, rents are determined by the Area Median Income (AMI), also known as the Median Family Income (MFI). The AMI in a specified area, determined by respective states, is the income earned by the family right in the middle of the income group, i.e.

half the families earn more the other half earn less. The AMI for NYC in 2015 was \$60,500 for an individual, which is calculated by the US Department of Housing and Urban Development (HUD) and adjusted for family size so that family incomes can be expressed as a percentage of AMI. These percentages are then divided into income categories

The most perplexing thing about this flawed metric is not just that all five boroughs register the same AMI (when the reality is starkly different) but also Westchester, Rockland, and Putnam counties, some of the wealthiest counties in NY State are included in this calculation, skewing the figures even further.

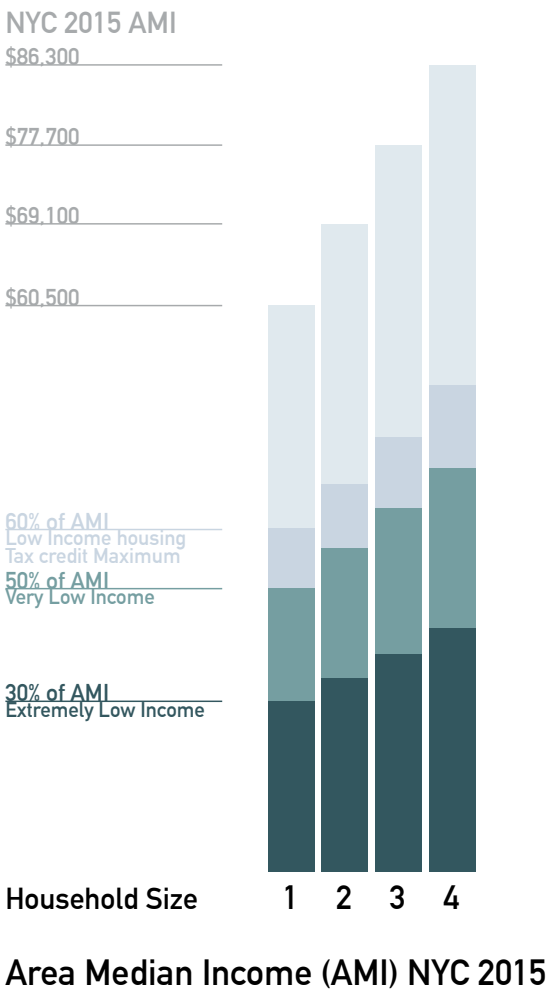
One of the federal interventions to create housing

- Extremely low income = <30% of AMI
- Very low income = 31% - 50% of AMI
- Low income = 51% - 80% of AMI
- Moderate Income = 81% - 120% of AMI

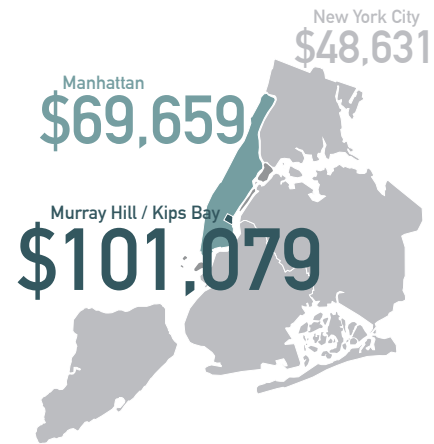
targeted to residents who are in the low-income (60 percent AMI) or below is to offer Low Income Housing Tax Credits (LIHTC), to avail of these, developers building affordable housing must cater to these categories. Carmel Place does not qualify in this regard; their affordable category starts at 80 percent of AMI which sits on the cusp of “Moderate income,” while accommodating middle-income earners these affordable apartments remain out of reach of the three different categories of low-income households and the working poor of New York City.

In 2014 1.7 million New Yorkers were living at or below the poverty line of \$21,000 per annum for a family of three. This statistic is based on the Official Poverty Measure (OPM) which, defined in the 1960s, looks at the minimum income required to cover food and daily needs. The Supplemental Poverty Measure (SPM) has since been introduced (2011) by the federal government to serve additionally as an indicator of economic circumstances. It not only focuses on income but also accounts for the necessities of food, shelter, clothing, and utilities and is adjusted for the geographic differences in the cost of housing. By SPM standards, 23 percent of New Yorkers face income poverty. Material hardship, “the chronic or

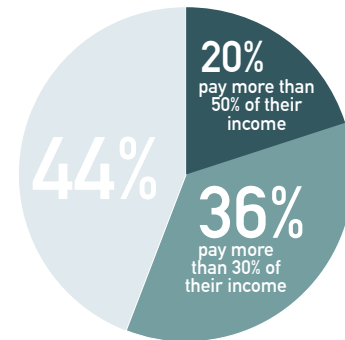
acute inability to make ends meet - lacking finances for food, housing, medical care or utilities (Wimer 2014) on the other hand affected 48 percent of all adult New Yorkers in 2012 and 2013. In that period, 37 percent of New Yorkers suffered severe material hardships, defined as a combination of lack of basic resources, having to stay in a shelter, having utilities shut off or, inability to pay a doctor.



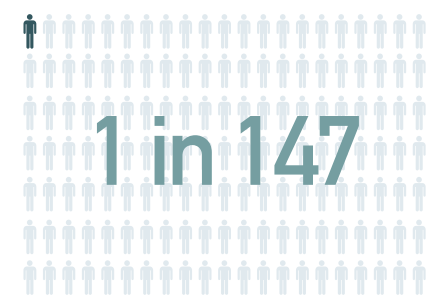




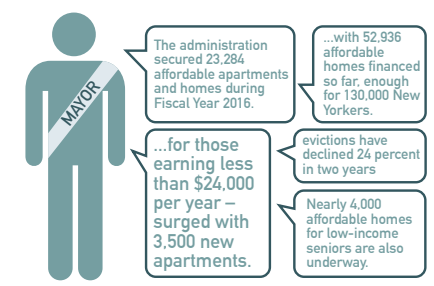
Median Incomes of NYC is not representative of the neighborhood specific AMIs



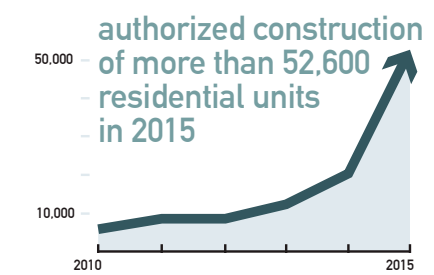
56% of New Yorkers are rent burdened 20% of which are spending more than 50% of their income on rent.



More than 58,000 people are in homeless shelters in New York and at least 3,100 more sleep on the streets and subways



Mayor De Blasio's 10 year plan



Skyrocketed # of construction permits because of 421-a tax exemption program expiration in 2016

SOURCE: 2015

Faced with record homelessness rates, the highest since the Depression, there is increased pressure on Affordable housing stock. In February of 2016, there were 57,000 people recorded living in shelters, 2,000 of whom have sufficient income to pay for low-income rent but are unable to find apartments, an additional 3,000 people choose to live full time on the streets. Current proposed federal budget cuts to permanent housing programs could lead to the loss of 500 shelter beds from what was available up to May 2016. In a City that is required to provide shelter for the homeless as a result of a landmark decision in the 1979 lawsuit, Callahan v. Carey, this is a staggering loss (Coalition for the Homeless). While New York City provides over \$1 billion annually for homeless services, the federal government continues to cut funding with “12 transitional housing facilities in New York City losing all of their HUD funding (Nahmias, 2016).” Despite the struggle to accommodate this steadily growing community the federal government, based on an initiative started by President Obama has made significant inroads in finding long-term housing solutions for one group - homeless veterans. “The Department of Housing and Urban Development (HUD) has reported that the number of veterans staying in shelters or on the streets has dropped by nearly 80% since 2009... In New York City almost 3,000 rental assistance vouchers have been distributed in the past six years to the recorded 3,689 homeless veterans in the city in 2009 (Stewart, 2016).” In addition, Mayor Bill de Blasio unveiled a plan in November of 2015 to invest \$2.6 billion over 15 years to create 15,000 new units of supportive housing aimed at various homeless populations.

One of New York City’s leading organizations dedicated to fighting poverty is the Robin Hood Foundation, which was formed 27 years ago with the goal of lifting 1

million New Yorkers out of poverty. Of the \$150 million which they grant each year, half is dedicated to children, towards education and youth programming, and the remainder to filling basic family needs, such as housing, food, and jobs. In the past two years, the foundation has involved themselves in a more capital approach towards affordable housing with the objective of stimulating the development or preservation of affordable housing. Affordable housing defined by the Robin Hood foundation means that a family that is making minimum wage “will get by and have a decent home to live in (Bea de la Torre, 2016).”

Bea De La Torre spoke in conversation with the Healthy Materials Lab about Robin Hood’s current project, New Stories. They are looking at opportunities with City-owned single-story buildings with high capital needs that can take additional density, specifically public libraries. The public library system has 207 branches, many in low-income neighborhoods. Robinhood plans to work together with the New York Public library system and the City, matching City funds, up to five million dollars, to renovate each location, and with the additional funding, leverage an opportunity to build affordable housing on top of each library. This is an innovative method of making land available for affordable housing which can be replicated in the same format with schools, hospitals, police stations, Human Resource Administration centers, utilizing air rights and the vertical nature of the city.

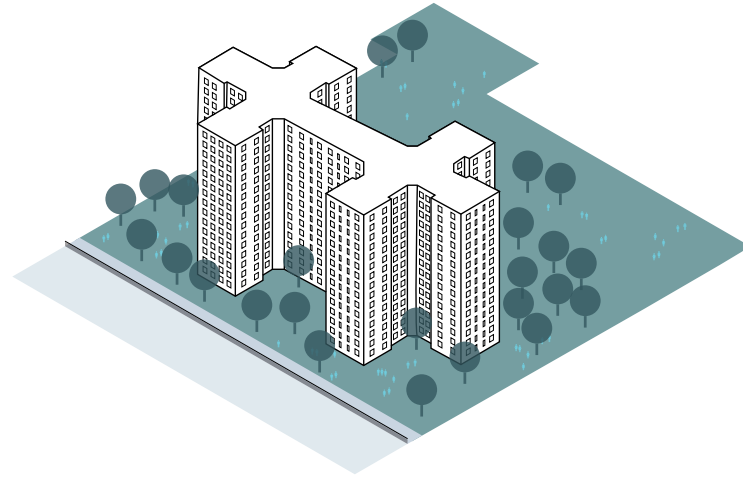
While there are many types of affordable housing available in New York City, the current stock does not reflect the growing needs of extremely low and low-income residents. Affordable housing for such groups is becoming an increasingly scarce commodity. In New York City there are a wide range of housing programs from different eras, as outlined in the following diagram, which make it a complex entity. It is the scale and the variety of the different affordable housing programs in New York which separates it from the rest of the country.

“The aid, care and support of the needy are public concerns and shall be provided by the state and by such of its subdivisions...”

Article XVII New York State Constitution



## NYC HOUSING PROGRAMS



### 1. NYCHA

The New York City Housing Authority (NYCHA) owns and operates 177,666 public housing apartments in New York City, 53,113 of which are located in Manhattan, housing 175,747 families in total. It guarantees permanent affordability for the tenants who do not exceed the established income limits, which vary depending on family size.

Low-income tenants in public housing pay 30 percent of their household income towards rent, up to the maximum rent levels for apartment size. The wait time for non-priority category household is on average nine years.

NYCHA owns the land that the developments are built on, but the federal government, HUD highly regulate it.

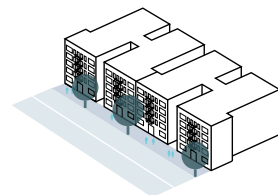
### 3. SECTION 8

The section 8 program allows tenants to rent apartments in privately owned buildings by paying 30 percent of their income towards rent while the government pays the difference between the tenant's portion and the full rent of the apartment. The program's goal has been to provide the choice of where to live, creating economically diverse neighborhoods as opposed to ones with concentrated poverty, which is how public housing is often seen.

Portable Vouchers: Funding for the program has run out, and the waiting list for vouchers is currently closed, with exceptions in a limited number of developments. This scheme currently supports 400,000 people.

Project-based Section 8: This program is a subsidized housing program for particular developments. There are approximately 90,000 project-based Section 8 apartments in New York City. When these government contracts expire, landlords may be able to 'opt out' of the program and raise rents to market rate.

When a tenant moves out of a Section 8 apartment, the landlord has the option of renting at market rate. If the low-income tenant is unable to find another Section 8 accepting apartment, they lose the voucher.

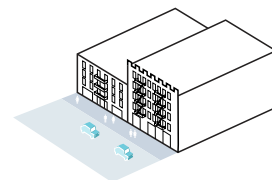


### 4. RENT STABILIZATION

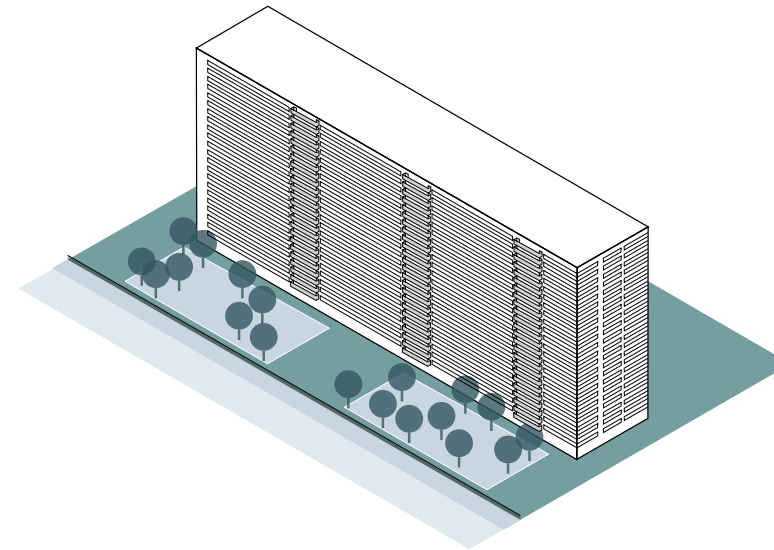
Rent stabilization is a set of laws that regulate rents and leases in certain privately owned apartment buildings in New York City and some suburban counties. It was enacted in 1969 to combat a sharp rise in rents, and generally governs buildings of six or more units that were built before 1974. There are approximately one million rent-stabilized apartments in New York City.

The legal rent and eligibility criteria are not based on the tenant's income levels. Rent regulation laws govern the rent-increases of certain privately owned apartments. Landlords can apply to deregulate an apartment that legally rents for \$2,500 or above, and where the combined household income exceeds \$200,000 for two consecutive years. Landlords can only raise rents in rent-stabilized apartments at levels set by local rent boards, and tenants cannot be evicted or denied the right to renew their lease, with limited exceptions.

Rent stabilized buildings have much lower rents than those created through subsidized affordable housing programs. The powerful landlord lobby has gotten politicians to significantly weaken rent regulation in the past 15 years, most significantly by allowing landlords to entirely destabilize apartments when tenants move out, leaving subsequent tenants with no protections.



### 2. MITCHELL LAMA BUILDINGS



Mitchell Lama was a middle-income housing development with over a 105,000 apartments. A program of the Limited Profit Housing Companies Act in New York that operated through the mid-1950s through the mid-1970s. The Mitchell Lama created both rental housing and limited equity cooperative housing.

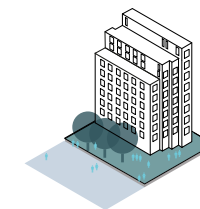
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### 5. NEW AFFORDABLE HOUSING CONSTRUCTION

New affordable housing programs are typically financed with Low Income Housing Tax Credits (LIHTC) or are a part of market-rate developments in programs such as 80/20 or Mandatory Inclusionary Zoning (MIZ).

There is no central waiting list for prospective tenants, and eligibility criteria differ from development to development, and sometimes, unit by unit. To avail of LIHTCs, units must be available to households making less than 60 percent of AMI.

Once a household rents an apartment, the income eligibility, requirements are no longer the basis of the rent, even though households are required to recertify their incomes each year.



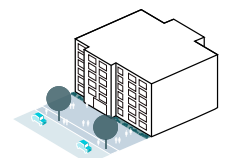
### 6. 421 a TAX EXEMPTION PROGRAM

421-a is an incentive established in 1971 that gives developers a 10-year exemption for building a multi-residential project on vacant land. Since 2008 the program was overhauled requiring the developers to set aside 20 percent of their units for affordable housing. The premise of the program was to offer developers of vacant or underused land a real estate tax exemption for the construction period (up to 3 years), followed by a 10-year-long exemption period which operates as an abatement.

The program was not just meant to be beneficial for the developers but also to be passed on to the tenant in the form of the apartments being rent stabilized during the exemption period. While the exemption provides significant savings, it is time-limited.

The suspension of the program is in part because of failure to reach an agreement to ensure union-level wages for the construction workers on those jobs. If it reinstated it would mean increased construction costs and if it is not, it may mean a drop in land prices.

The 421-a exemption is not an affordable housing program, while it does provide 20 to 35 percent affordable units in developments that avail of it, it is mainly used to benefit market-rate developments, and the range of affordability often excludes low, very low and extremely low-income groups.





## SECTION 5

## PARTNERSHIPS &amp; POLICY

## 5a. Finalists for adAPT NYC

Thirty-three teams submitted proposals for adAPT NYC, a record number of entries for HPD in its history. The RFP was downloaded 1,600 times in all five boroughs, nationally in Boston, Chicago, San Francisco, Miami, and Denver, and internationally in London, Berlin, Athens, Hong Kong, Bangalore, and Sydney.

Here are the finalists for the adAPT NYC competition with a brief outline of their submission.



**Pocket Living (London) + BFC Partners (NYC)**  
Developers, Rogers Stirk Harbor + Partners and Alexander Gorlin Architects.

At the time of application, the developer had just completed five projects with compact one bedrooms in London. They proposed a 10-story building with 75 units from 250-350 sq ft.



**“CO: Compact, Connected, Complete”** submitted by Jonathan Rose Companies (Developer) , Curtis + Ginsberg, Grimshaw (Architects), Scape Studios (landscape design) and Life Edited (Apartment interiors).

This proposal along with its 60 units, averaging in size of 303 sq ft each having a balcony. An added component to this proposal was a “Product Library” where residents could check-out larger, bulky items for infrequent use like chairs or cooking equipment.



**“Tandem”** was the proposal by Hamlin Ventures LLC, Forsyth Street Advisors LLC + Rogers Marvel Architects and Future Expansion Architects with 80 units from 265-300 sq ft.

This team had increased amenity space compared to that offered in current 80/20 buildings, including laundry, bicycle storage, professional meeting space, music practice room and art studio, dining room, double height lounge with screening room, roof garden, and yoga studio.



**“Studio House”**, proposed by The Durst organization and Dattner Architects.

Both companies have experience with affordable housing in NYC. This proposal included ten stories with 60 units averaging 303 sq ft with a rooftop terrace and lounge, gym and co-working space.



**“Max”** by Blesso Properties, Bronx Pro Group LLC + HWKN and James McCullar Architects

This proposal was with 56 apartments each 250 square feet also highlighting the importance of building community beyond the walls of the apartment with amenities and shared spaces of communal kitchen, climbing wall, gym, deck, library, and vegetable garden.





## 5b. The Team

While ‘The Team’ is generally considered to be the groups or individuals who worked on a project from the design stages through finished construction, for this Case Study we have broadened the team to include those organizations whose involvement was critical to this project’s fulfillment from the onset.

CHPC and HPD played a crucial role in the realization of Carmel Place. They forged strong relationships with the developer and the Team as a whole and had continued to maintain a connection with the project throughout construction. It was important for the City to choose a team that would be able to successfully execute the project under the demands of all of the criteria but also is innovative in a way that would herald a new way of thinking about designing and building housing for twenty-first century New York. There was a robust collaborative process between the Team, the complexity of the project necessitated this approach whether from negotiating building tolerances to  $\frac{1}{8}$ ” (generally associated with making furniture) or exchanging ideas on material choices.

Monadnock Development led this team from the onset with the co-owner of the Lower East Side People’s Mutual Housing Association (LESPMHA), joining when the project was already underway. LESPMHA is a non-profit, established in 1987 during the last term of the Koch administration that has rehabilitated vacant multi-family buildings owned by the City, and constructed new-multifamily buildings, specifically in the Lower East Side of Manhattan at a time when the City was calling on non-profit and for-profit developers to undertake developments of the administrations ten year housing plan. Their goal as an organization is to provide long-term affordable housing for New York City residents. While it was not directly involved in the design or construction of Carmel Place, it will oversee and provide support for the formerly homeless veterans’ component of the affordable units. Monadnock Development has been creating sustainable housing (both rental and homeownership) in New York City for more than a decade, with a special interest in generating affordable housing since 2008. They decided from the onset to employ all of their own expertise and to pursue a modular development for this proposal. The Monadnock team also comprises of sister organizations in modular fabrication, Capsys and Monadnock Construction. The general contractor and construction management company have worked in New York City since it was established in 1975. It is from this foundation that its other entities grew.

Creating affordable housing is an important part of the organization’s mandate, and depending on the year and the particular projects, 30 to 80 percent of their work is in the affordable housing sector. Capsys was formed in Brooklyn, New York in 1996 to build 691 single family homes for Nehemiah II in the New Lots section of East New York. This development was a phase in the Nehemiah Program, a 100 percent affordable, home-ownership program for first-time homeowners in East New York, Brownsville and the South Bronx.

“In the past 6-8 years we have been really focused on affordable housing, that’s where our expertise lies, that’s where our relationships lie with the city, that’s where a lot of our construction knowledge lies. So, we’ve built and developed thousands of units in the city and the boroughs across the city and they range in very low income, housing for formerly homeless people to middle-income homeownership to buildings which mostly are rentals. We work with the City a lot as a partner in terms of them providing the subsidy, municipal bonds and then also the state and through the subsidy given by the federal government.”

(Tobias Oriwol 2016)



The other critical team player were the architects—nArchitects—a Brooklyn based architecture firm founded in 1999 by principals Eric Bunge and Mimi Hoang and based on three core principles—to advance conceptually driven, socially responsible and technologically innovative architecture. While housing has been a central interest to the firm, and affordable housing would fit into their ethos, Carmel Place is their first built affordable housing project. Monadnock Development reached out to them being confident that would bring a fresh eye to this unique RFP.

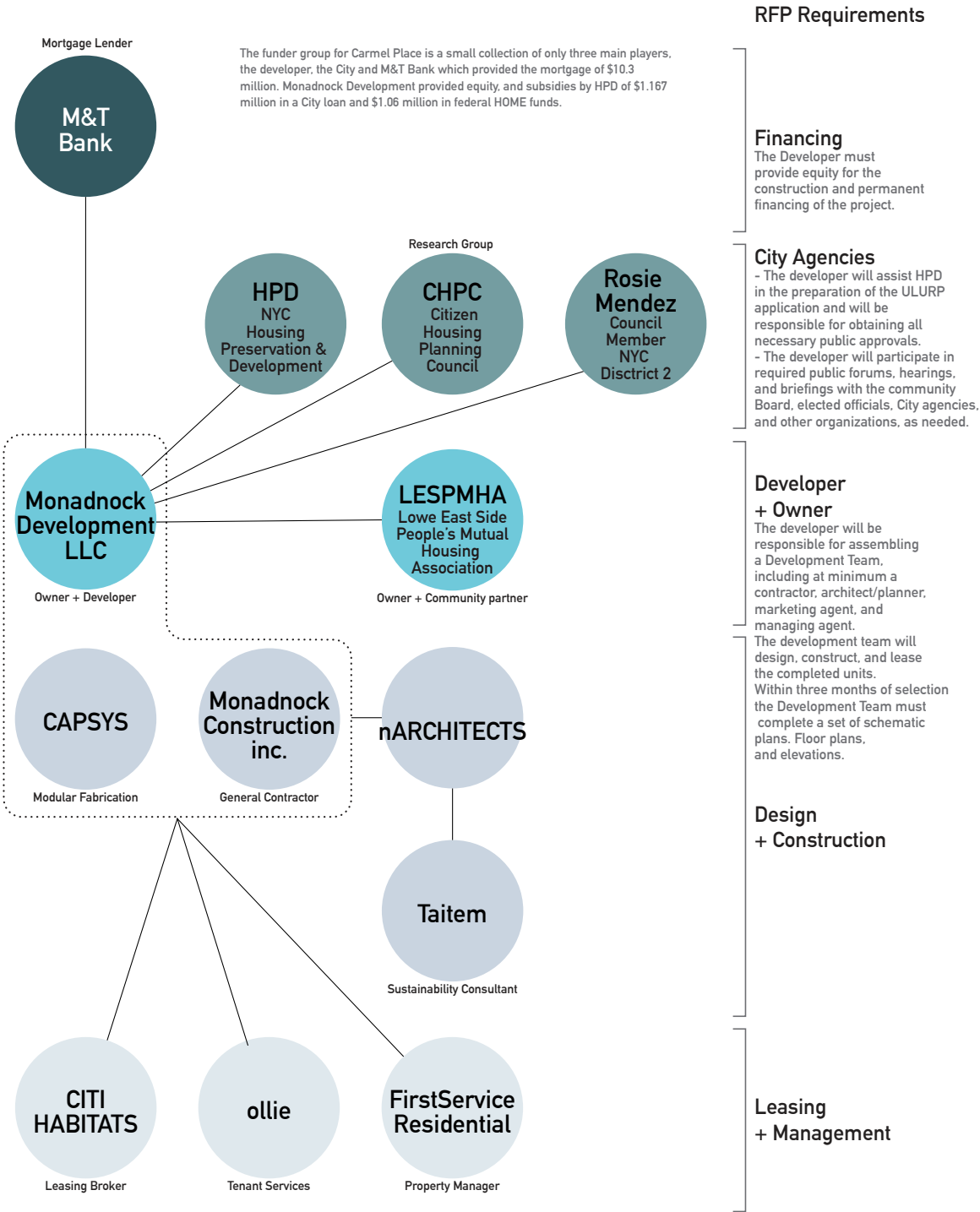
Their practice covers several different types of architecture beyond residential—cultural, public spaces and pavilions—and their interest in housing is its future, how populations will live. This question encompasses issues such as affordability, demographics, design, and thinking about relationships between living and working. nArchitects felt that this was an excellent opportunity to challenge the public’s preconceptions about living in small spaces whether it be the City’s history of SROs or the issues faced with overcrowding. The principals were keen to acknowledge the team effort involved in the design of Carmel Place led by project architect Ammr Vandal.

As previously mentioned CHPC and HPD were instrumental in the realization of this project both bringing their own expertise at different stages to incubate ideas for the RFP. CHPC is a New York City based research and education group established in the 1930s as part of the New Deal, at a time when public investments were being injected into the city as a response to the Depression. The organization, with a board of 90, is made up of practitioners working in real estate across the country—developers, architects, lawyers, landlords, financial and industry experts—all who recognize the value in housing. Their audience is ultimately government and industry leaders, shaping policy and the housing market. Currently, their board has two members of Monadnock Development, and their secretary is the Marketing Director of Resource Furniture. CHPC has a variety of research and education initiatives which range from technical and small initiatives to large-scale research projects such as the aforementioned Making Room, the catalyst for this pilot, inspiring the City to test these ideas and explore the potential for more efficient, compact and denser housing to respond to the demographic change. HPD as the nation’s largest municipal housing preservation and development agency actively works to promote the construction and preservation of quality

affordable housing throughout the city. It provides financing through loan and development programs and enforces building standards by responding to housing code violations. As was the case with Carmel Place, HPD provides low-interest loans to developers and allots publicly owned land through the RFP process. Bea de la Torre was the Assistant Commissioner of Planning, Green, and Marketing at HPD through the inception, planning, and development of Carmel Place. In an interview for this case study report, she explained the excitement created by the RFP with submittals from teams who were new to affordable housing design but were captivated by the potential to create a new typology of housing.

Once the winners were announced in January 2013, the community outreach began which included meeting with the community board and City Planning Commission. The role of the team was to provide testimony for the project, communicating why it was a much-needed development for the City and speaking to the health benefits of living in small spaces that were well designed, particularly betterment in quality of life with increased light and air from 7’ x 9’ windows in each unit. The City Council Member for Kips Bay, Rosie Mendez, has been a strong advocate of preserving affordable housing in District 2, through sponsoring, voting and passing bills that improve the rights of tenants, preserving rent-stabilized apartments, and securing tax abatements for buildings to maintain permanent affordability. At Carmel Place, she has worked relentlessly to ensure that eight of the affordable units would be made available to the formerly homeless veterans, who are now within walking distance to the VA hospital on 24th street and First Avenue.

STAKEHOLDERS DIAGRAM





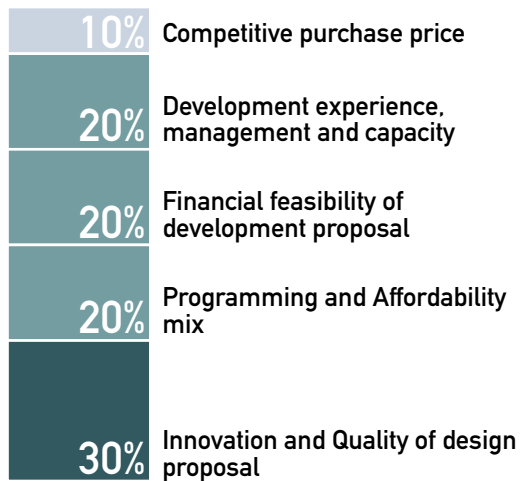
CRITERIA  
FOR SELECTING  
PROJECT + TEAM

- . Completeness of proposal
- . Comparable development experience
- . Comparable management experience
- . Conformance with RFP
- . Ability to finance
- . Feasibility of development proposal
- . No adverse findings

The primary parameter of this RFP was to build as many micro-units as possible (75 percent or more), to make it as affordable as possible and maximize how much money was to be paid to the City for the land acquisition. In addition, there was a detailed scoring sheet, noted above, in which design, financing, and affordability are more heavily weighted. Another factor taken into consideration was the track record of the developer, contractor, architect and property manager, to ensure that each was able to execute a budget of this size in the timeline that had been proposed. The relationship between the number of affordable units and financing is the first negotiation in affordable housing, with a deal being executed for the most feasible proposal. After winning the competition, there was a yearlong re-zoning and Urban Land Use Review Process (ULURP) which had significant involvement from the community board, city council, and city planning commission allowing for the scheme to be refined further over this time.

“The architects were involved from the beginning in the process and part of the conversation throughout the time of refinement. Because all of those things—design, financing, affordability—were up for discussion and because this was an RFP about design, about changing zoning laws, the design played a larger role than in other affordable RFPs where the main goal is to create as many affordable units as possible. This one was really meant to test specific zoning laws so there was a lot of attention paid to quality of life in the unit, livability, fair housing

EVALUATION  
OF PROPOSAL



guidelines, making sure that the building was compliant with everything so there was a ton of input on that and nARCHITECTS has been with us since the beginning and has been the one to answer those questions (Tobias Oriwol, 2016).”

The team continued to grow as the project developed. Stage 3 Properties had previously approached Monadnock Developers with their business idea for providing services and amenities in rental units. While Monadnock Development believed in the model, it was not until the adAPT NYC proposal that they found an opportunity to work together. Ollie, whose enterprise aims to foster community within buildings through social events, offers services to residents of the building, including cable, WiFi, housekeeping and a weekly errands. This convenience is available to all residents at a monthly fee but has been donated by the developers to the Veterans in their units. They became involved in Carmel Place in early 2015 with an already established relationship with Resource Furniture, the distributor for the Italian company Clei, whose furniture, with its health and sustainability ambitions, Ollie specify and install in all their units. Steve Spett, co-owner of Resource Furniture was present at the stacking ceremony and was so inspired by the Council Member Mendez’s commitment to formerly homeless veterans that he offered to donate their furniture to them.

5c. Land Use Policy - Rezoning Process

New York is a true leader in housing policy with a series of notable firsts in the nation, including its tenement laws, its first comprehensive zoning ordinance, and its first public housing project. The challenge of today’s economy is not only the preservation of what exists for middle and low-income residents, but also in the creation of a new typology of housing stock that best reflects the needs of the City’s current and projected residents.

The Mayor’s ability to implement a series of zoning overrides which allowed the potential of a low-rise luxury only building to become a mid-rise luxury building with 40 percent affordability was a major reason for this project to be possible. As mentioned earlier, zoning resolutions govern all building and development; they are constraints that were put in place to preserve comfort, safety and livability which mandate unit size, building height, and footprint. Over half a century since the last major overhaul of the zoning resolutions, today we are faced with a rapidly growing city, a changing demographic and an existing housing stock that cannot meet current needs. With no previous city-led initiative envisioning what a new typology of housing could look like, this pilot study marks a new beginning in which the City was faced with and embraced a means or rethinking the future of housing in New York City. As the City has control of what can be built, it is responsible for directives to encourage innovative design. The process of making an amendment is long and arduous, but as a pilot study, the City was able to call on the Mayor to make one-time zoning overrides, provided the land is publicly owned.

This RFP from HPD was atypical because it was not 100 percent affordable and because it proposed more than 75 percent micro units. Except for this project, it was illegal to construct an all micro-unit building at that time. The City department wanted to explore a viable option for a new typology of housing that would equally advance a feasible micro-unit pilot project that is replicable to maximize the affordable units in the city, as is their exclusive, standard aspiration. Now, in 2019, more micro unit buildings are up-coming and being planned and built.

The goal of the RFP was to encourage innovative thinking on the design and construction of micro-units to cater to the new smaller household types, revealed through the Making Room study to now be a substantial portion of the City’s current and projected population. The zoning overrides would primarily govern the size and density of units allowing the most efficient use of livable

space. Rethinking the current minimum unit size of 400 sqft (introduced in 1987, Quality Housing Program) for a single user household gave rise to a guideline of 250 - 350 sqft, as well as other resolutions which dictated building height, setback and lot condition. As is the nature of a pilot project it provides the potential for development of micro-units on privately owned land.

“While talking about affordable housing in NYC, there was a need to start thinking about the unit composition itself from a square footage perspective. According to data collected there are a significant number of single person households across the spectrum of age, ethnicity, economic status, etc. that perhaps would be interested in living in smaller units. The supply and demand were not meeting up. So we started to think about alternative housing models that potentially could address the needs of single person households. That is how adAPT NYC was born.”

Bea De La Torre 2016





SITE SPECIFIC ZONING

The zoning overrides at Carmel Places are directly related to issues outlined in the Quality Housing Program (1987) which consists of four components:

- neighborhood impact,
- building interior,
- recreation space and planting, and
- safety and security.

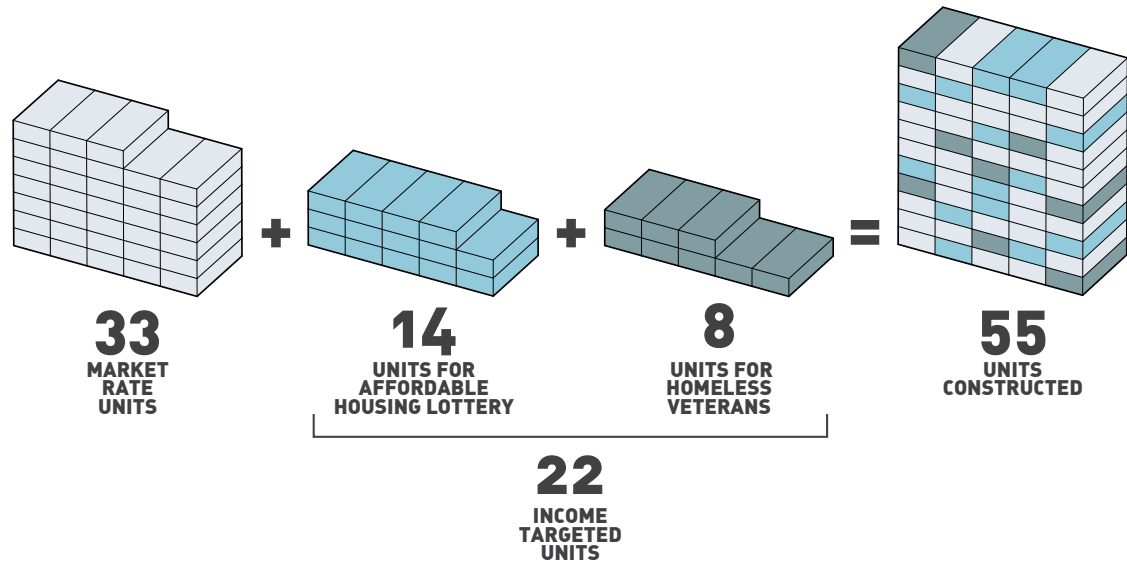
The neighborhood impact component controls the effect of the Quality Housing building on the neighborhood and includes mandatory bulk regulations. The building interior component sets a minimum size of a dwelling unit (400 sq ft for all new construction), mandates proper refuse storage and disposal systems, and encourages laundry facilities and daylight in corridors. The recreation and planting component establishes minimum space standards for indoor and outdoor recreation space and requires the planting of open areas between the front building wall and the street. The safety and security component encourages fewer dwelling units per corridor.

The clear takeaway from this scheme is that had the overrides not been put in place for this project a developer would only have been able to construct 38 apartments on

that lot. To make the project financially viable those units that would have had to be larger, luxury apartments to make a return on the construction costs and would have excluded any possibility of affordable units.

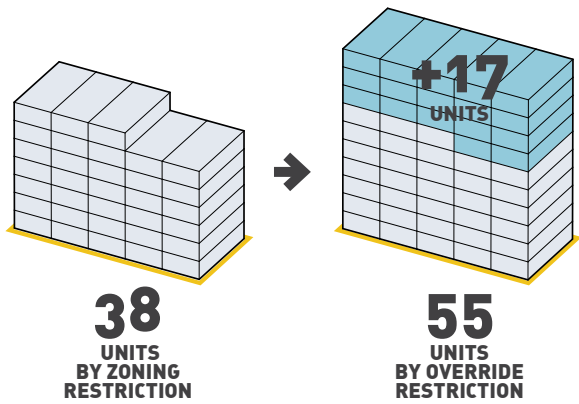
Mayor de Blasio’s affordable housing plan “NextGen NYCHA” established a long-term strategy to stabilize the current status of NYCHA. One component of the program is to join forces with private developers who will purchase fifty percent ownership of six developments and inject \$350 million into them and an additional \$100 million in refurbishing existing NYCHA units. Two of the developments that have been identified are Holmes Towers on Manhattan’s Upper East Side which has 2, 25-story buildings with 537 units on 2.8 acres a fraction of the property’s total acreage of 16.2. As part of this deal, there will be one new building constructed with 300-400 units. Wyckoff Gardens in Brooklyn which currently has 527 units in three 25-story buildings on less than an acre an additional 550-650 units are proposed for the 5.8-acre site. With this quantity of land available, NYCHA and its partners can potentially utilize the FAR without impinging on landscaping and play areas that bring such health benefits to the residents.

Carmel Place Apartment Types



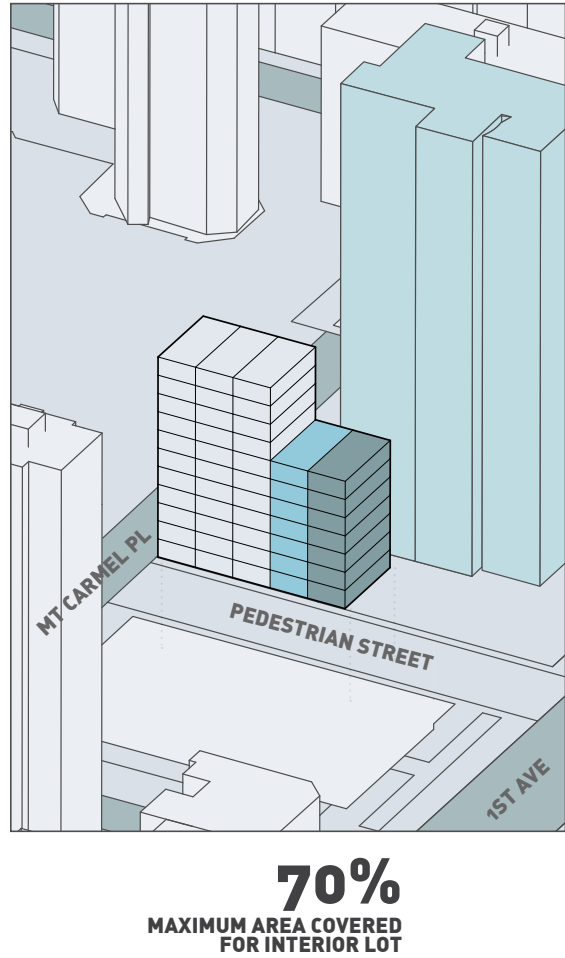


### Zoning Districts Determine Dwelling Unit Density

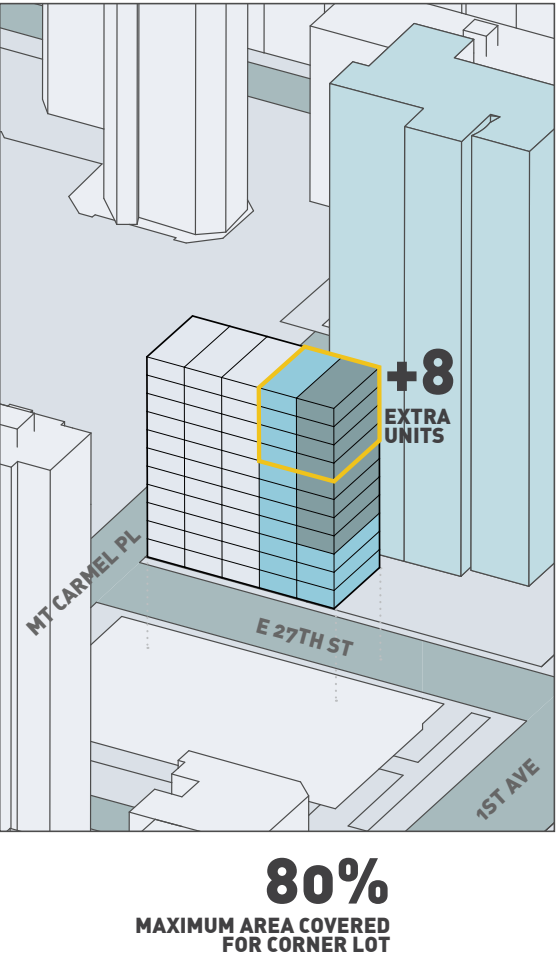


RESIDENCE DISTRICTS (R) are the most common zoning districts in NYC (=75% of the city's zoned land). To regulate the diversity in residential building forms, the zoning resolution designates ten basic residence districts R1-R10. The numbers refer to bulk and density (controls that maximize size and placement of a building and the maximum number of dwelling units permitted on a zoning lot, respectively) with R1 having the lowest density and R10 having the highest. NYC Department of Panning. ZR SEC 23-22 Restricts the number of dwelling units that can be built in an R8 district - The maximum number of dwelling units shall equal the maximum residential floor area permitted on the zoning lot divided by a factor of 740 NYC Zoning Last Amended 02/02/2011

### Lot Locations Determine Lot Coverage

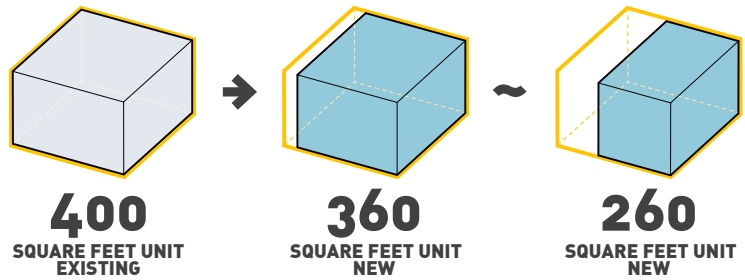


ZR SEC 23-145 Regulates the maximum area that a lot can be covered, corner or interior. This site has both a corner or interior lot condition - Maximum lot coverage and floor area ratio for Quality housing buildings.

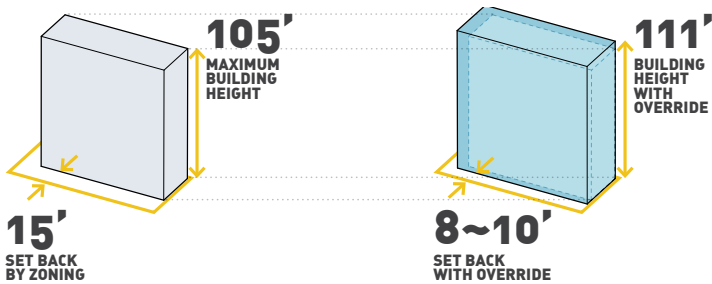


Corner lot: 80%, Interior lot: 70% NYC Zoning Last Amended 02/02/2011

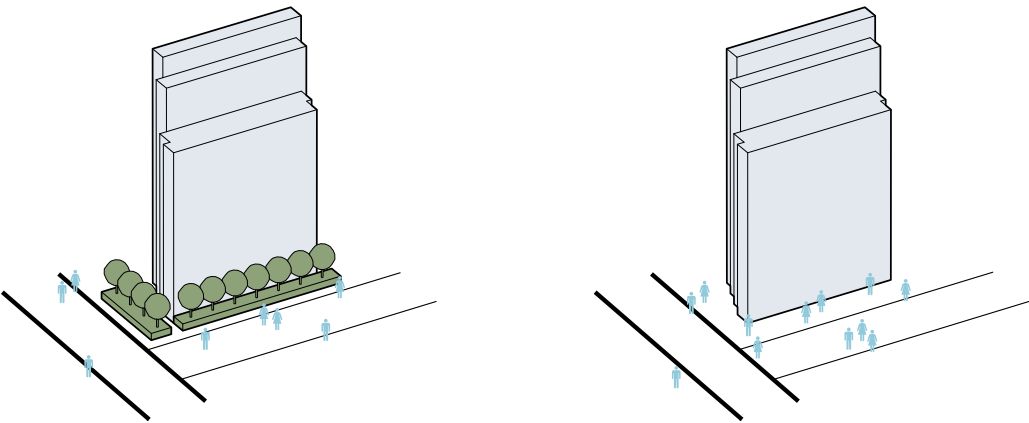
### Smaller Households = Smaller Units



### Site Characteristics Determine Height and Footprint



### Integrate vs. Isolate



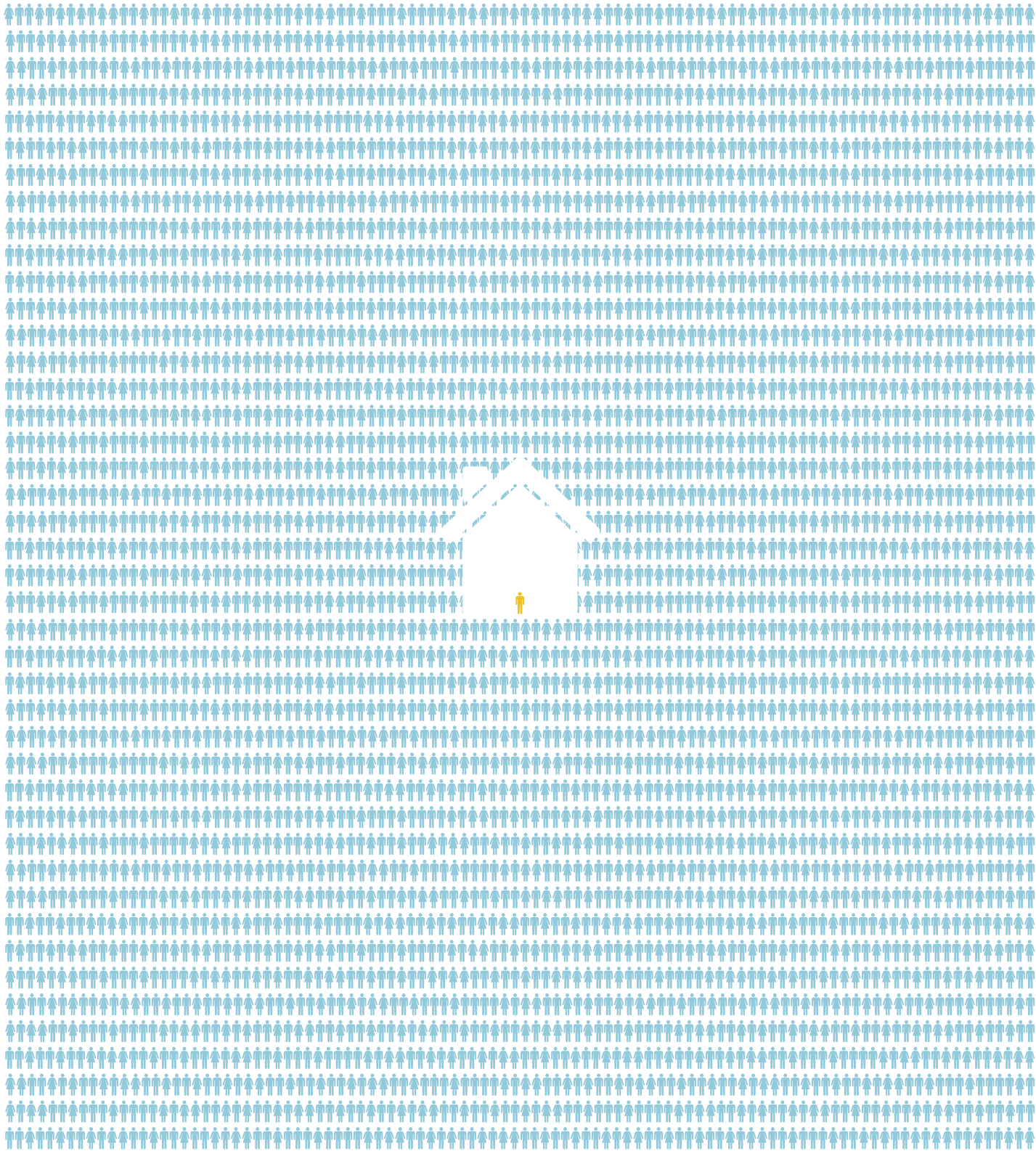
ZR 28-33 Requires plantings in the area of the zoning lot between the street line and the street wall of a residential building constructed under the Quality Housing Program in an R8 district. In the interest of creating a shared and active pedestrian space and strengthening



the project's relationship to the surrounding urban environment the override was recommended. NYC Zoning Last Amended 02/02/2011 & 09/24/2013 Respectively



**14** AFFORDABLE APARTMENTS  
**60,000** APPLICATIONS



**4,285** APPLICATIONS PER APARTMENT

### 5d. Housing Policy and funding in the income-targeted sector

Delivering a funding solution at the submittal stage was one of the requirements of the RFP. Working with a small number of funders simplifies this process. There is an inherent demand for speed and certainty as HPD launched adAPT NYC in July 2012, announcing the winner in January 2013.

For all affordable housing developments, that cater to populations earning 60 percent or lower of the AMI, developers can avail of LIHTC for those units specifically. These tax credits, which are administered by the HPD, once sold can be a significant percentage of the equity of a project reducing the remaining financing costs in which investors receive a reduction in corporate federal income taxes for ten years. Rather than emulating the scale of public housing this scheme is geared towards smaller scale projects that rejuvenate rather than replace neighborhoods. Nehemiah Housing Development that Capsys and Monadnock construction have built extensively for is a choice example of LIHTCs being used in affordable housing. The Nehemiah Program was established by local churches in the Bronx and Brooklyn, local organizers and the City of New York (the City’s contribution to provide vacant city-owned land) to build affordable housing without Federal Assistance. East Brooklyn Congregation (EBC) are a non-profit group comprised of religious organizations, schools, homeowners and voluntary groups representing East New York, Brownsville, Ocean Hill and Bushwick, founded in 1980. They have created 3,298 Nehemiah Homes and 898 rental units. The Nehemiah Program offers assistance with down payments to anyone who can qualify for a FHA (Federal Housing Administration) loan which is a mortgage insured by the FHA. Borrowers with these loans can avail of mortgage insurance which will protect them if they default on the loan, a requirement for those putting less than 20 percent down. Once EBC completes Spring Creek Nehemiah, they will have created 4,525 homes in Brownsville and East New York. While Carmel Place did not utilize this stream of funding, HPD typically apportions \$12-14 million in credits each year to approximately 20 plus projects resulting in 1,000 low-income units. By 2010 in excess of 80,000 units, with approximately 210,000 residents, had been built with the help of LIHTC. In NYC only 122,000 units were developed or preserved by 2013, another indicator that the units that are being built are catering to the middle income or higher groups. Federal HOME funding, also administered by HPD, is another economic stream that was adopted by the developer. The HOME Investment Partnership Program provides grants that fund activities

associated with the development and redevelopment of affordable housing for rent or ownership. The grants can also be used to provide rental assistance for low-income households. HOME is the largest federal block grant to state and local governments designed exclusively to create affordable housing for low-income households.

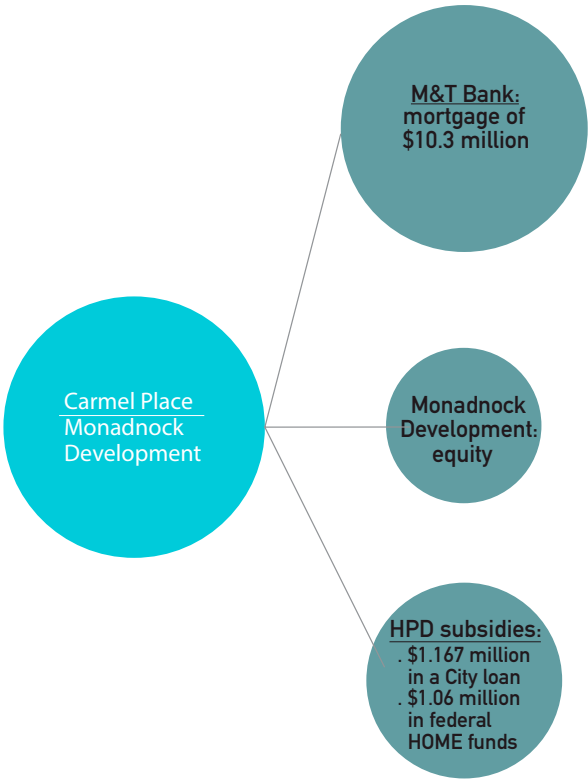
The initial objective of the RFP was that very low-income households would be included in the affordable make-up, but as is the primary struggle with the math of affordable housing the number of affordable units is constantly being negotiated depending on the number of total units and land price. Land price and buildable land are the main toggles which determine the amount of affordability in any given development. The eight apartments governed by the VASH program will operate as per Project-based Section 8 vouchers, which this means that these tenants only pay 30 percent of their income towards rent.

The funder group for Carmel Place comprises of three main players, the developer, the City, and M&T Bank which provided the mortgage of \$10.3 million. Monadnock Development provided equity and subsidies by HPD of \$1.167 million in a City loan and \$1.06 million in federal HOME funds. The loan from the City required that the development be 40 percent affordable but this in conjunction with the land price, land formerly owned by the City, was also negotiated and finalized at \$500,000. Depending on the levels and the combinations of affordability achieved in New York there are various agencies from which to qualify for subsidy and opportunities to avail of City Council funding if it is a project that is well received by the community.



The funding process of any affordable construction is a careful balance of dollars, number of units and amenities. There are a variety of ways for the funding to be structured, to maintain the goals of the Team, but the framework for the financing is essentially the same across cities.

The Main Players:



Ultimately, an affordable development is designed to increase its access to targetted income group. The government helps plug the funding gap to create a viable financial pro-forma.

“You have a building, and it either makes financial sense, or it doesn’t so somewhere if you are going to bring the rents down, if you are going to artificially structure the rents in a portion or the whole building, there has to be some other plug-in as a source of financing, so it’s just done in different ways in different programs so there could be a plug-in of a tax credit, it could be a plug-in of free land if the city owns it, it could be a plug-in for an 80/20 where you are getting bond financing, and you are using the luxury apartments to cross-subsidize the lower ones.”

Sarah Watson 2016

New York State Housing Finance Agency (HFA) offers tax-exempt financing to multifamily rental developments in which at least 20 percent of the units are set aside for low-income tenants in what is commonly referred to as the 80/20 projects. According to the Federal Tax Code, a minimum 20 percent of the units must be set aside for households with incomes at 50 percent or less of the local Area Median Income (AMI), adjusted for family size. Alternatively, 25 percent in New York City must be affordable to households whose income is 60 percent or less than the local AMI, adjusted for family size. There is no added incentive in this program to go beyond these percentages and create more affordable units. Under the 80/20 program, for specific periods the project’s affordable units must remain affordable to low-income households and these units will be subject to a Regulatory Agreement between the owner and HFA. The agency’s regulatory agreement assures that the maximum rent for these affordable units cannot exceed 30 percent of the applicable income limits. The remaining units in the project are rented at market rates.

Some other methods of creating the plug-in are tax credit programs, in which the developer can take tax credits and sell them, capital grants from the government, and grants for supportive housing. In the 1980s when the City was crippling under many financial issues, the City claimed land that had been abandoned and used it as an incentive, by giving it for free to developers, to stimulate the market.

Whether catering to middle income or low income or very low income, the program details demand information on the source of finance or the incentives. The level of income targeted in development will dictate the plug-ins that are sought — the lower the AMI that a development caters to the more plug-ins that are required to make the project financially viable. A significant number of projects are around 60 percent of AMI because that is the major sources of financing.

The agreed land price of \$500,000, even by 2013 standards, was much lower than the market rate at the time. From the perspective of HPD, the idea was to let the developers leverage the value of the land at a decreased price in order to be able to subsidize more affordable housing units. In the submittals, there was variation in land prices. According to Bea de la Torre, some were higher bids but only offered 20 percent affordable housing as opposed to 40 percent. The challenge for the City was to manage these variables, HPD has the land valued and can use that as a basis and factor it into

financing from the onset. The developers also go through the same process. Typically, with City RFPs the land price is nominal, as little as one dollar because the goal is maximizing affordable housing. In this case, as a pilot study, the City was agreeable to reducing the percentage of affordability to explore a new typology of housing.

For Monadnock Development, Carmel Place is atypical too as it does not have their classic, affordable housing structure. Their projects are typically much larger, 100 units or more. Therefore, when building on that scale, the primary vehicle for financing is tax-exempt municipal bonds, which are administered through the IRS to the state and then administered by the state to localities within the state. New York City’s insatiable need for affordable housing takes up most of that need, these become a large part of the financing depending on the affordability levels that are provided. The development teams can also qualify for low-income tax credits, a federal program which provides tax credits in return for delivering affordable housing. City subsidies, from different agencies, are also available and can be used to fill the gaps.

Monadnock rarely has construction loans or traditional mortgages. Instead, they rely on bond financing. The bond financing requires a developer to get credit enhancement from a lending institution, the lender teams up with a tax credit investor who provides a lump sum of money up front for the future stream of tax credits that will be released over the life of the development. It is this lump sum of money that is used to fund the project. The credits are in turn purchased by public or private entities which provide credit advancement to fund such a long-term investment.





## SECTION 6

## CERTIFICATIONS: STRIVING FOR HEALTH AND WELLNESS IN AFFORDABLE HOUSING

Although certification was not a primary initiative for the project, the Team was required to comply with Enterprise Green Communities Criteria (EGCC, 2011) as it is mandatory in all city-funded projects. Carmel Place is the first affordable development in which Monadnock Development has sought LEED Silver, while their construction company has built LEED Silver market rate developments for other owners. Monadnock has a goal of improving the neighborhoods within which all of its housing types are built. It was through the architecture of the RFP that Monadnock realized the potential for achieving the LEED Silver standard. While pursuing many sustainability goals in their work, this is also the first residential project for which the architects will have achieved this certification.

“Carmel place encompassed a whole quality of life. It wasn’t just limited to a two-dimensional shape or how big the rooms were. It was really how people could live in this building, live in this neighborhood how the building could function and serve as a prototype for this type of development in the future and we thought that encompassed many things including transit-oriented development, density, energy efficiency and material selection and affordability. It’s really about rounding out the whole identity of the building during the RFP process so that was when we decided we could feasibly get LEED Silver on this building (Tobias Oriwal, 2016).”

The premise of the design guidelines was to “promote innovative design that facilitates the development of functional and affordable Micro-units... present a mixed-use building whose exterior design is as innovative as its interior design.” This innovation is guided by a scheme, The EGCC Checklist, operates nationally and informs all RFPs issued by the City of New York and City authorized projects. It is a green building framework whose objective is to encourage healthy, sustainable and environmentally beneficial design specifically within the affordable housing market. The overarching goal is that residents in affordable housing will be “healthier, spend less money on utilities, and have more opportunities through their connections to transportation, quality food, and health care services (Enterprise Green Communities Criteria, 2015).” Carmel Place complied with the 2011 checklist. The checklist is modified and gives some additional clarifications for HPD projects in New York City. The EGCC operates on a points system with all projects having to adhere to the criterion’s mandatory measures. Depending on the type of construction a minimum number of additional points are required

(New construction +35 points, Substantial Rehab and Moderate Rehab project +30 points). There are eight categories in which to achieve points, and within each category, there is a mix of mandatory and optional points.

- Integrative Design,
- Location + Neighborhood fabric,
- Site Improvements, Water Conservation,
- Energy Efficiency,
- Materials Beneficial to the Environment,
- Healthy Living Environment
- Operations + Maintenance

HPD encourages all projects to go beyond the minimum set of criteria. Carmel Place’s intended optional points were 56, 21 above the recommended 35.

In filling out the checklists, the team was required to identify who would take responsibility for each item and what their strategy would be to achieve the required points. In the case of Carmel Place, these roles were divided between the developer, architect, general contractor, modular manufacturer, and sustainability consultant. As the checklists are reported in two stages, an initial submission which occurs during the design phase and a final certification within 60 days of the project completion, it requires the team to develop their strategies for health and sustainability from the onset of the project. The requirements at the beginning of the project include an overview of the project, a project site plan, a context map, the energy modeling form and the intended methods of meeting the Criteria outlined as a part of the Green development plan that is generated by Enterprise Green Communities. The categories that are of a particular interest to us at Healthy Material Lab are “Materials beneficial to the environment” and “Healthy living environment” and while we would hope that these categories would be expanded to include a more rigorous approach to material selection and installation, the team at Carmel Place did pursue all available points from each of these categories.



The EGCC updated in October 2015, and the NYC Housing Preservation and Development also revised their criteria for projects which they finance. In addition to amendments to the overlay, the significant new requirement is that the project architect, general contractor, and developer each have to attend a “Green Communities Healthy Homes Training” which is conducted by the Department of Health. This training is a three-hour seminar which focuses on the integration of healthy building practices during building design, construction and renovation as well as ongoing building operations and maintenance. The key areas covered are pest management, smoke-free housing, and active design. The Healthy Homes NYC certificate is valid for three years. Enterprise Green Communities recognizes the impact the built environment has on health and wellbeing and has restructured and included more criteria to address this.

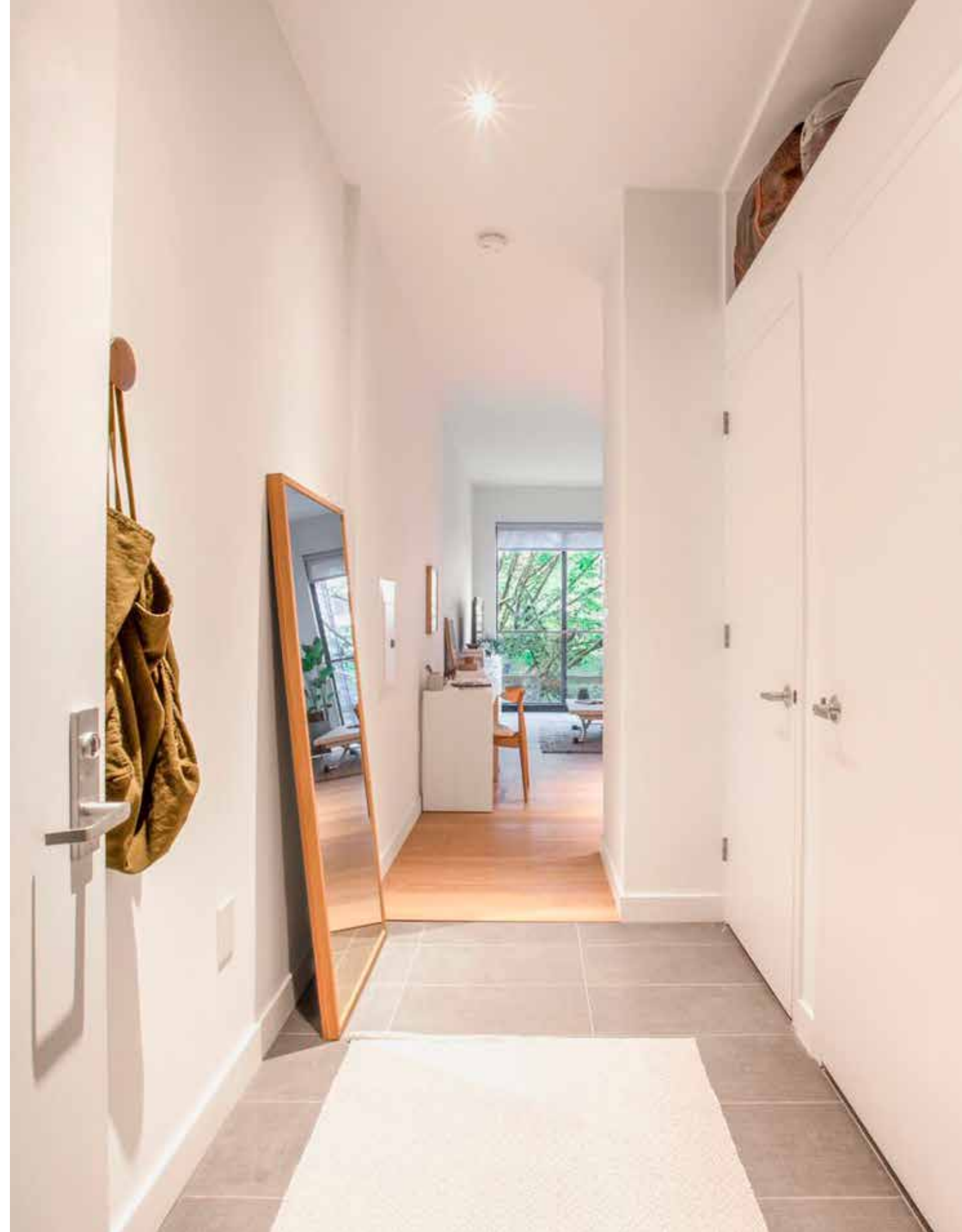
**“Where you live, work, learn and play impacts health outcomes. Unfortunately, data shows that low-income and certain racial and ethnic minority populations are disproportionately affected by these factors, and often suffer from poor health. Low-income communities often suffer from higher rates of asthma, cardiovascular disease, diabetes, cancer, mental health issues, and injury and death (resulting from violence, substance abuse, and transportation-related incidents), relative to higher-resourced surrounding communities.”**

Enterprise Green Communities Criteria Manual 2015, 21

The 2015 criteria also is supported with a guide to incremental costs which outline an estimate of what it will cost, in addition to standard construction costs, to meet the criteria. This guidance allows the design team to provide for the additional costs in their budget from the project’s inception but also an opportunity for overall assessment of the benefits of implementing specific criteria in each project.

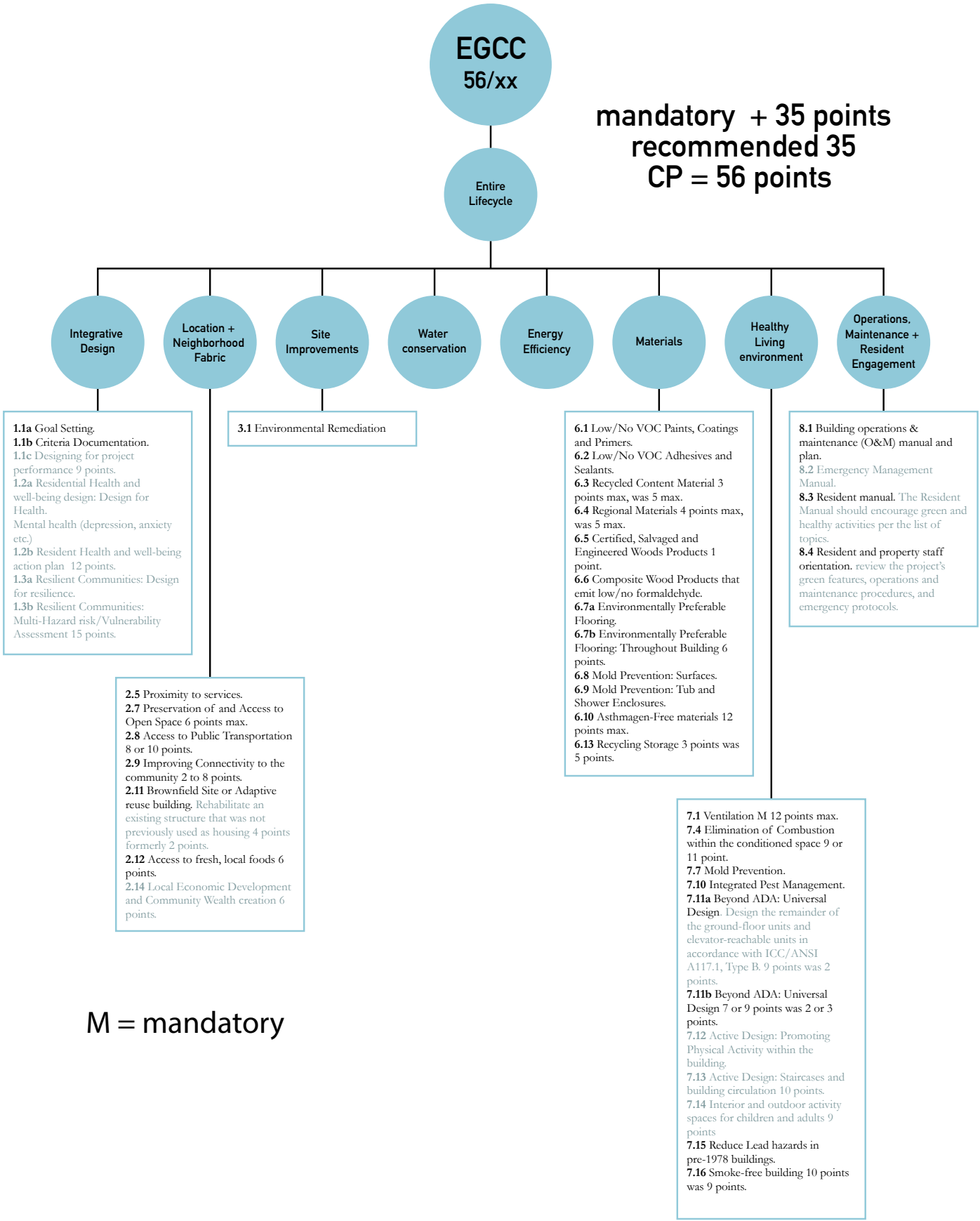
In terms of category name changes for the EGCC “Materials beneficial to the environment” simply becomes “Materials” in the 2015 revised checklist and there are notable changes to the lists and some mandatory elements are moved from the Healthy Living Environment to Materials such as

- 6.6 Composite wood products that emit low no formaldehyde, Environmentally Preferable Flooring,
- 6.8 Mold prevention: Surfaces,
- 6.9 Mold prevention: Tub and Shower enclosures and a new standard has been included
- 6.10 Asthmagen-Free materials, although optional and not required by HPD, carries a maximum of 12 points. As, according to the City of New York, Asthma is the leading cause of emergency room visits, hospitalizations and missed school days in New York City’s poorest neighborhoods it could be hugely beneficial to make this a mandatory requirement as the EGCC is targeting the affordable housing market. This particular guideline recommends not installing products that contain ingredients that are known to cause or trigger asthma giving specific products to avoid in the categories of Insulation, Flooring, Wall coverings and Composite woods

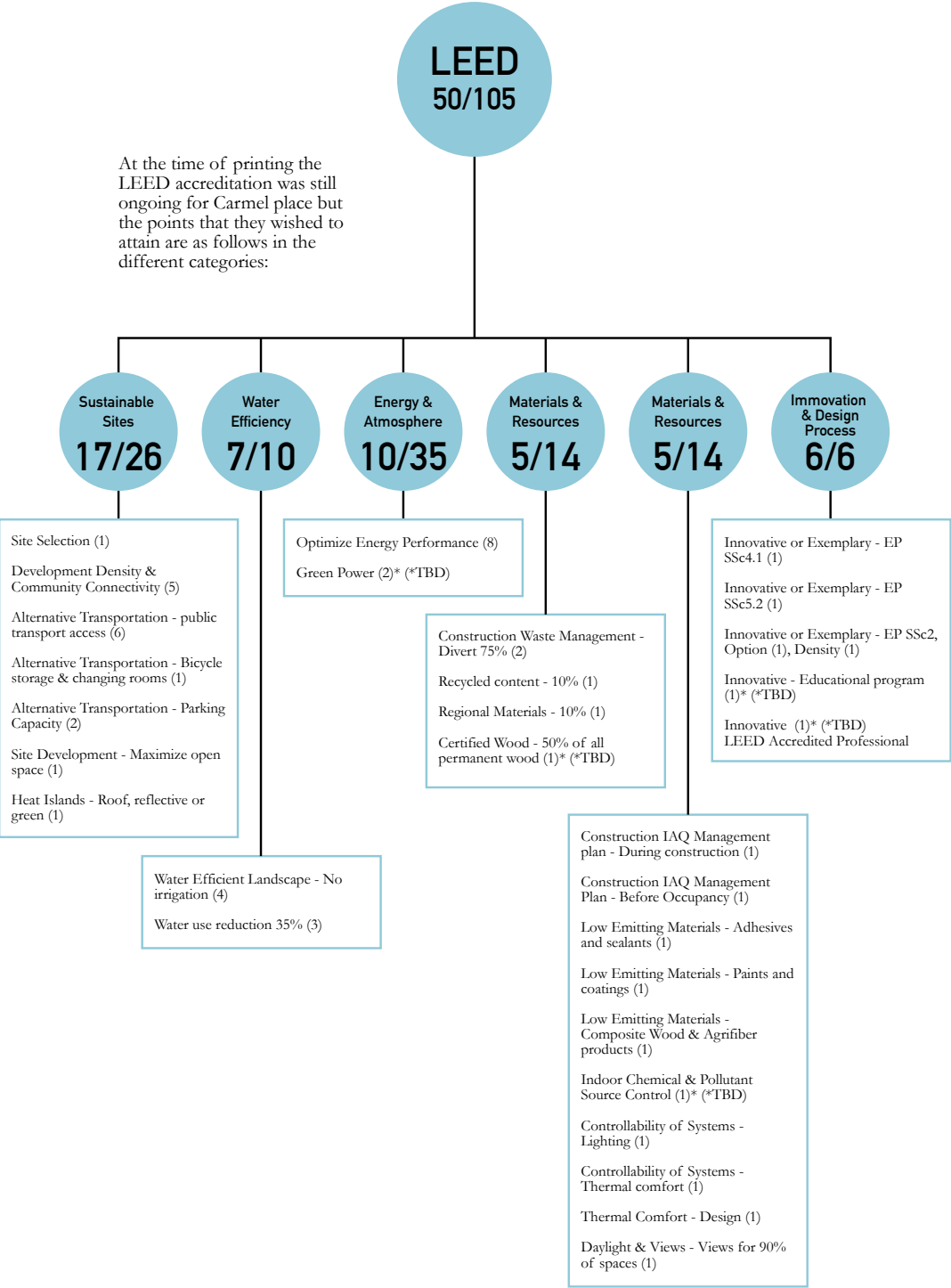




CERTIFICATIONS DIAGRAM



M = mandatory



Each rating system remains open and available for certification for at least six years after the rating system registration close date.



The significant points changes made in Materials

. Recycled Content Material - 5 points max (2011) 3 points max (2015)

. Regional Materials - 5 points max (2011) 4 points max (2015)

. Certified, Salvaged and Engineered Wood Products - 5 points (2011) 1 point (2015)

. Environmentally Preferable Flooring: Throughout Building - 4 points (2011) 6 points (2016)

. Recycling Storage - 5 points (2011) 3 points (2015)

For Environmentally Preferable Flooring, which has been a mandatory guideline since 2011, includes an HPD clarification that “hard surface flooring products may be pre-finished environmentally preferable materials, such as bamboo.” This overlay has been removed from the 2015 checklist but it is more specific in requiring that any hard surface flooring products must be either ceramic tile or solid unfinished hardwood floors (as opposed to “unfinished hardwood floors”) and prefinished hardwood flooring must also meet the Scientific Certification System’s Floorscore program criteria.

Resident Health and Well-being requirements were outlined to encourage teams to access local health data or community engagement to identify at least one relevant Resident Health Campaign. In addition, teams were encouraged to identify the sources used, as well as the building design and programming factors, that can enhance the health of the residents to include at least one optional standard associated with the Resident Health Campaign(s).

While Enterprise Green Communities has made great strides in developing some more comprehensive criteria for built affordable housing projects, and HPD’s particular commitment to this sector is notable, it would be encouraging to see more stringent mandates on specific criteria, particularly relating to indoor air quality. “75 substances linked to asthma are found in paints and adhesives - two products found in most typical indoor environments (Perkins + Will, 2012).”The No/Low VOC requirements for paints, coating, primers, adhesives, and sealants could be strictly No VOC. This change would force specifiers to look to the healthier alternatives, if this can happen through the Health Department in NYC and they include it on their overlay. If this case study were to identify one disease that is of grave concern to New Yorkers, particularly those with children and in

high poverty neighborhoods, it would be asthma.

Asthma is an environmental disease, and its prevalence is related to poor housing conditions and poor indoor air quality. Asthma constitutes a significant public health problem. “In 2014, approximately 17.7 million (7.4%) adults and 6.3 million (8.6%) children indicated they currently had asthma (CDC, 2014).”

“Asthma affects people of all races, both sexes, and all ages, and it affects people in every region of the U.S. However, asthma is seen more often among children, women, and girls, African Americans, Puerto Ricans, people in the Northeast, those living below the federal poverty line, and those with particular work-related exposures.”

CDC National Asthma Program [http://www.cdc.gov/asthma/pdfs/breathing\\_easier\\_brochure.pdf](http://www.cdc.gov/asthma/pdfs/breathing_easier_brochure.pdf)

As reported by the Children’s Environmental Health Center at Mount Sinai asthma rates have tripled in the past three decades and become the leading cause of emergency room visits, hospitalizations, and school absenteeism. It affects 250,000 New York children and disproportionately minority children. The indoor air pollutants that are generally found in homes and schools, and commonly linked to asthma, are secondhand cigarette smoke, pesticides, molds, VOCs, insects (cockroaches) and rodents (mice). While eliminating VOCs and creating smoke-free buildings is critical, so is designing and building interiors where openings are sealed, and there is no opportunity for insects and rodents to enter and flourish within the unit, building, and development. Using materials and products, for example, solid wood kitchen cabinets, as opposed to those made of composites which can harbor cockroaches, can help combat negative health externalities.

LEED is the most recognizable of green building certifications on a global level. USGBC, a privately run not-for-profit manages the certification. It is third-party verification for green buildings and communities, with a mission to improve a building’s impact from a sustainability and environmental perspective by evaluating performance over the life cycle of a building. While considered a well-meaning initiative it also has many detractors who claim it does not truly strive for a greener community in which its certified buildings live.

The LEED rating system offers four certification levels for new construction—Certified, Silver, Gold, and Platinum—that correspond to the number of credits accrued in five green design categories: sustainable sites, water efficiency, energy and atmosphere, materials and resources and indoor environmental quality. LEED standards cover new commercial construction and major renovation projects, interiors projects and existing building operations. Standards are under development to cover commercial “core & shell” construction, new home construction and neighborhood developments.

Carmel Place is in the process of achieving LEED Silver® status which is awarded if it reaches 50-59 points, their goal is 55 points (LEED Certified™: 40-49, LEED Gold®: 60-79 points earned, LEED Platinum®: 80+ points earned). The maximum number of points that can be achieved is 110.

Each LEED project must also meet Minimum Program Requirements (MPRs), also known as the minimum characteristics that a project must possess in order to be eligible for certification. In LEED 2009, for which Carmel Place submitted the MPRs, are as follows:

1. Must comply with environmental laws (all applicable federal, state and local building-related environmental laws and regulations).
2. Must be a complete, permanent building or space (No building or space that is designed to move at any point in its lifetime may seek LEED certification)
3. Must use a reasonable site boundary (all land that supports the building is to be included, cannot include land owned by another other than project owner and any given lot may only be attributed to a single LEED project building)
4. Must comply with a minimum floor area requirement (minimum 1000 sq. ft. of gross floor area, Camel Place has 29,000)

5. Must comply with the minimum Occupancy Rates - Full-time equivalent occupancy (The LEED project must serve 1 or more FTE occupants)
6. Must commit to sharing building’s energy and water usage data (for at least five years, beginning occupancy)
7. Must comply with a minimum building area to site area ratio (the gross floor area of the project building must be no less than 2% of the gross land area within the project boundary)

As with the Enterprise Green Communities criteria, all of the primary team members —Monadnock Construction, nArchitects, Capsys, Titem Engineering—were involved in the process and each had a responsibility in their own given area, across all categories. There are also mandatory requirements within each category, except for Innovation & Design Process and Regional Priority. Indoor Environmental Quality has two prerequisites - Minimum IAQ Performance and Environmental Tobacco Smoke (ETS) Control.



## SECTION 7

# INNOVATION IN HEALTH AND DESIGN

"From the perspective of HPD it is an integrated approach doing all the things that you need to do from a building materials perspective, creating opportunities for active exercising and if you could put a hydroponic farm to service the CSA it's a complete combination"

-City Agency

"I think the issue of healthy material may be one facet of health in micro units. If we think about it as a set of different scales of contact, the bigger scale of urban sprawl, urban expansion, the burden on transportation, and other sorts of infrastructures can be mitigated by dense, livable, healthy cities where you can walk to work. These shouldn't become micro-unit buildings instead be buildings that allow small households to live efficiently and healthily."

-Architect

Innovation also comes from each of the stakeholders bringing their perspective on health to this job as can be revealed in the following quotes.

"Council Member Rosie Mendez, a vocal advocate for affordable housing who has served Manhattan Community District 2 since 2006, was also the prime sponsor in a bill (06/11/2014) to reduce asthma causing toxins. One of its proposals was to develop a pamphlet explaining the hazards associated with indoor allergens and a guide outlining work practices that can be established, available to any member of the general public."

-Local Government

"Specializing in sustainable low-middle income and market rate apartments and homes, Monadnock primarily see their health initiative to be achieved through sustainability and resolving complex projects that improve their neighbourhoods"

-Contractor

"We created a program-ollie- which provides housekeeping services, organizes community events and social and physical activities that ensure a better quality of life to the residents which encompasses health for that organization."

-Stage 3 Properties



**“We still have a master bedroom and smaller kids bedroom which only works for a family. For example, it’s not an ideal arrangement for people sharing space. It has a very specific market in mind and that market is going away.”**

Sarah Watson, CHPC 2016

What is particularly noteworthy for a project that has a 40 percent affordable housing component, is that it has maintained the same materials and finishes throughout. One of the stipulations of programs with city or state incentives is that developers must disperse the affordable units throughout the building so as not to segregate low-income renters. Also, so that the building is more cohesive as a whole, regulations also include requirements for fair distribution of views, access to shared spaces and appliance of equal sizes but not brands. It is not required that the finishes are the same throughout. HPD insisted that the development would include amenities that invite resident interaction such as a gym, resident lounge, and outdoor terrace. Other recommendations were a virtual doorman, laundry facilities, storage room, and bike room.

As earlier discussed, Monadnock Development looked to a design team that had not previously worked in affordable housing. nArchitects had not built a modular building, but Monadnock found their work to be very interesting and believed that they would be able to embrace the modular nature of the building. For nArchitects technical innovation is a key element of their work and as a practice, they embrace working with new materials and ways of building, alongside tried and tested practices, which brings an element of risk and experiment to a project. They have, therefore, cultivated a means of working that allows them to push innovation.

Within this category of the future of housing - affordability, demographics, design, relationships between living and working - nArchitects are very interested in exploring the notion of ‘The Dispersed House.’ This

concept represents a shift from the typical apartment or “beehive mentality of little cells (Eric Bunge, 2016),” to creating shared spaces and providing amenities which allow connections to be forged between residents, in effect creating social spaces in the building which become an extension of individual units. They attribute the success of their design to following the RFP guidelines very stringently while also being able to make a statement within the many constraints they were given. In the building design they sought to make a big gesture in the aesthetic of the building by offsetting the modules, and through use of different colors of the exterior brick, they created the appearance of four towers rising out of the ground.

Innovation is evident in designing a building which is modular but is designed as if it were a more traditional construction type. The variety in the module types (13) demanded rethinking the classic stacking of the same one or two modules on top of each other to create a dorm-room or hotel scenario that conveys the familiar look of modular housing. nArchitects designed a building which is modular in every way but was designed without any of the common restrictions that would be associated with modular, minimal number of module types as an example.

**“As an architect to be involved in something that could really shift the housing paradigm of New York is really exciting”**

Mimi Hoang, Principal, nArchitects 2013

## 7a. Designing Innovative Income-Targeted Housing

Modular design itself is a relatively new building type, but has its roots in what was considered the future of housing when Sears Roebuck & Company began to sell mail order homes through their Modern Homes Program at the turn of the 20th century. In the years 1908 - 1940 they sold in excess of 70,000 homes with 477 different housing styles from the elaborate to a simple cottage catering to the customers of different economic levels. This range of choices enabled the customer to design their own home, and allowed the kit of parts to arrive and be constructed on site. At the same time the assembly line concept was also introduced into manufacturing through Ford Industries. This method of working allowed more stringent quality control and reduced construction time. Both of these principles, prefabricated building components and assembly line fabrication, when adopted by the housing construction industry resulted in the birth of the modular home business. By the mid 19th century modular building becomes a new form of housing construction which can be more easily understood as a fabrication process in the factory and reverting to construction on site.

Capsys have been in operation at the Brooklyn Navy Yard since 1995 and has built in excess of 3,000,000 sq ft in that time. At the time of construction of Carmel Place, Capsys was the only New York City approved modular fabricator and had twenty years of experience with multi unit developments. Since the beginning of 2016 it was acquired by Whitley manufacturing and is no longer part of the Monadnock family.

The attractiveness of Modular design, while not a cost or labor saving method of construction, is that it can, in ideal circumstances, reduce the project schedule by 50 percent. This does not necessarily mean that such projects are less expensive to build, but rather, that efficiencies of time can make it a much more effective way of building. On the construction site the foundations and ground floor are constructed, once the units are stacked they are bolted together. Each module, with all of its bathroom and kitchens fixtures, electrical and plumbing installed, is then connected leaving only the installation and application of flooring and exterior brick. This method of construction requires a lot of decision making up-front. Design decisions that would not necessarily need to be made at this point in a traditional building, for Carmel Place had already been finalized from the beginning of the process.

“Here you have to figure it out in the shop drawings early

**“We also loved that it was modular construction. We thought that there are a lot of things to be tested there from a pilot perspective also. Efficiencies and potential cost reductions or reductions in time which ultimately equal cost as well.”**

Bea De LA Torre HPD 2016

on. You have to make all the decisions including light fixtures early, it’s like a factory, the materials have to be there.” Peter Hansen, Monadnock Construction 2016

The primary challenge for Carmel Place from the perspective of the contractor is the limited size of the site itself. The units were driven by night over the Manhattan Bridge and had to be held on site from 2:00 AM to 7:00 AM, when the job site opened. While being a New York specific project, the construction process was particularly time consuming and required careful scheduling to make the journey in the allotted time, with a limited number of units—those that could be stored and stacked in any given day—being transported by night.

**“It is site specific, it’s building specific, some buildings are better suited to modular construction those are ones that are completely composed of studios like this one, it’s minimizing these types of units that you have that makes the assembly line nature of modular construction more beneficial”**

Tobias Oriwol 2016



In terms of installation, the modules were lifted onto a preconstructed foundation, cellar and a steel podium, which would carry the second floor through the ninth floor. There is no additional steel that is built on site above the ground floor. The modules were then stacked on each other, relying on the structure of the adjoining modules. All of the plumbing and electric from each of the units is run through a single chase in the hallway, the chases are lined up and connect to each of the floors above and below. Once stacked the chases are connected and welded together.

The design of the building, with setbacks in plan and in elevation, leads to a more complex construction. As the structure is offset as it goes up, with units moved 4 to 6 inches back or out, requires, from a structural standpoint, careful consideration. Despite these challenges, the modules, starting on the second floor, were stacked on top of each other at a rate of approximately one every 15 minutes.

“To fit in a floor plate of 8 modules with 2 elevators and a scissor stair requires a single loaded corridor, it was a tight squeeze to get the amount of apartments that we have in this building so we’re butting up on a lot of the minimum dimensions from building code standpoint, from fair housing guidelines, from multiple dwelling law guidelines so everything is compliant (Tobias Oriwol, 2016).”

Modular has inherent attributes that cost more. The modules are completely closed boxes, each has a floor and a ceiling with another module on top with another floor and ceiling. Double walls, floors and ceilings provide a highly beneficial feature for soundproofing, which was a major concern for HPD when they developed the RFP. Acoustics impact the health and quality of life within the apartment, however the additional soundproofing also influences the height of the building which is governed by zoning. Each unit, being a closed box, could be stored on site while being protected from the elements. This was not as big an issue for Carmel Place for which modules were delivered the night before they were installed, meaning their exposure to the elements was minimal. However, this is a major consideration for other modular development, where, in the interest of time and money, all units, upon completion, would be delivered to and stored on site. The benefit of building indoors is that it is more controlled, it is safer and less wasteful. When building indoors weather is not a concern and concrete can always be poured, drywall erected and floors tiled as it is always the right temperature. Weather related delays are avoided. It is also less wasteful because there is more

control over the surroundings and it is more efficient in terms of materials as leftovers can be reused which on a traditional site would be thrown out because of a lack of storage space. In the factory location, scrap can be placed in a dedicated area and used in another part of this project or an entirely different project down the line. In a traditional construction job there is a daily or weekly pickup of garbage so there is no opportunity to store materials and reuse them for another project. An additional safety measure is that as the fabrication happens at ground level, workers are not dealing with construction at a significant height. Working on one module at a time contributes to a less risky environment and to less on site danger. This is the tallest modular building Capsys built and yet each piece was built, unit by unit, on the ground.

In terms of project management and oversight, there were essentially two sites, the factory and the site on 27th street. Many of the critical interior aspects had already been reviewed and built when the modules arrived on site.

Modular is an ideal candidate for the construction of affordable housing as can be seen in the successful collaboration between Capsys, Monadnock Construction and The East Brooklyn Congregation (EBC). Together they have worked on 1,000+ units in East New York since the creation of Capsys. The success of these units is due to the simplicity in the number of modules used. Working with two modules per development makes the installation phase significantly more straightforward than when using 13, as was the case in Carmel Place.

## 7b. Researching and selecting healthy building products

As with affordability, defining Health brings it’s own set of issues. This stems from the divergences in definitions and expectations of what health means to different stakeholders, committed to healthier buildings and communities. There has been a lot of discussion on mental and physical health, whether in relation to exercise and eliminating conditions such as obesity, or creating smoke free and pest free environments, both of which contribute to asthma. We are asking that the question of health be asked in a more foundational way. In other words, how can we introduce products and materials into the built environment that do not negatively impact the health and wellbeing of residents?

Not having previously worked in affordable housing, nArchitects did not already have an established library of “affordable” products and materials that they could reference for this project, instead they approached it as they would have any of their other residential project. Bringing the same objectives and goals, to develop a lean material palette (“less materials to specify, less mistakes to make! (Eric Bunge, 2016)”) with aesthetics and durability governing choices. It is their own design aesthetic that led the architects to use natural materials. Material performance was a also very important factor as the project was striving for LEED Silver certification and the EGC criteria previously outlined.

“I’m suspicious of checklists or any top down approach that dictates what kind of material you use, how they can really help our city [is] if we could measure the energy that we are using in these buildings. I have a suspicion of any kind of limitations that are dictated to us, but it would be great to improve our knowledge for sure. So I wish someone would provide a very clear database of experiments and laboratory tests demonstrated along with the medical discipline to demonstrate the actual health benefits of these materials but I’m not sure if it’s a question of all the architects in the sense that being told how to specify materials but industries producing these materials maybe have to subjected to some testing ultimately. [Then] when all the stuff is put out there we know that it’s healthy (Eric Bunge, 2016)”.

As architect Eric Bunge explained, there were no initial specifications going into the project, more a constant dialogue of specifying, testing and reviewing individual products and alternatives to make sure they all met the same criteria. Each material went through several rounds of testing. In the context of modular building, and with the overlays of certification checklists, often products and materials were eliminated as they did not meet the criteria needed. This resulted in constant team involvement to

“ I think it just has been intuitive to us to gravitate towards natural materials which are inherently more healthy”

Eric Bunge, Principal nArchitects 2016

find materials that could successfully be installed. This also allowed them to think of materials they had previous experience with that may not be typically used in rental buildings. The wall paneling as an example, had been tried and tested and the architects were confident about its performance. In the context of Carmel Place, the play of light on the wood panels offered a level of quality to the lobby interior.

At all times, and particularly in the affordable housing market, the deciding factor in product and material choices is the cost. In different instances they found great materials that were surprisingly inexpensive such as the bathroom wall tile—glossy white with a texture—which was the result of “a little bit snooping in unexpected places (Eric Bunge, 2016).” This particular material in question is a porcelain tile which is a better alternative, not simply in terms of its materiality but also through the nature of its installation. Having been installed floor to ceiling, meeting another porcelain tile on the floor, there is no opportunity for mildew to develop on the walls. Additionally, the joining and sealing where the materials meet prevent rodents from entering the apartment via the bathroom, demonstrating that while taking a closer examination at the materials used in a project is essential to health in a building, the way in which they are installed is also critical. Poorly installed floors, wall finishes, kitchen cabinets and baseboard, which create even minuscule openings, can allow pests access to an apartment, and once they establish a source of food they proliferate.

The furniture made available to all of the units but installed, at no additional cost, in the units for the formerly homeless veterans is designed to optimize space in small units. Distributed by Resource Furniture in the U.S. and Canada, it is manufactured by an Italian company, Clei. The company has its own commitment to sustainability and health by using recyclable materials - particle board, wood, glass, iron and aluminum and lacquers that are water based, non- toxic, solvent and formaldehyde free.



7c. Resident engagement and Community building

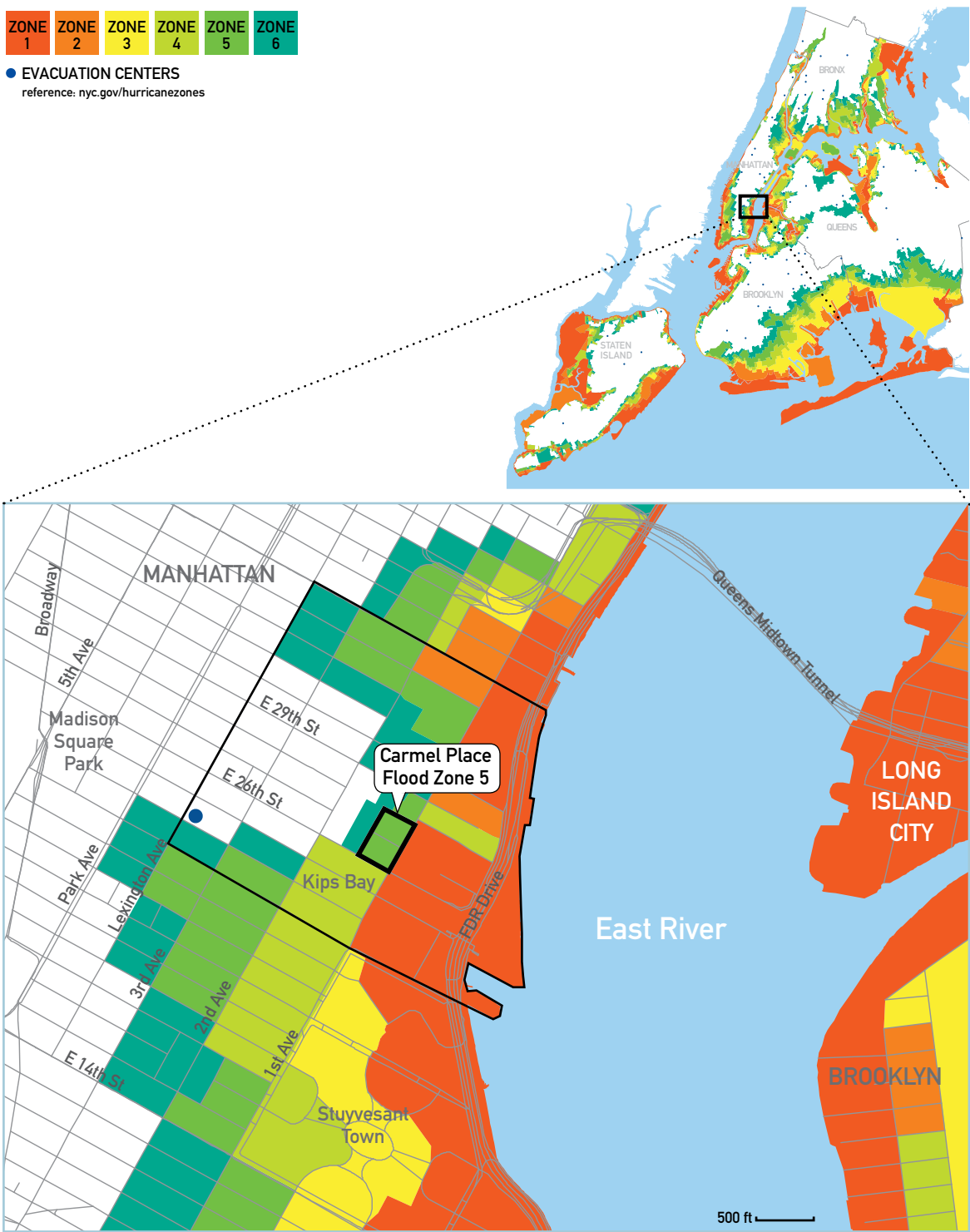
While post occupancy studies were not a standard practice for Monadnock Construction prior to Carmel Place, it is something that they are thinking about implementing, particularly in terms of energy studies. They do however, offer warranties on all of their work and keep Post Occupancy Repair (POR) logs to record any performance issues or problematic equipment. This in turn becomes a reference catalogue of unsuccessful materials and products to be avoided in future jobs.

Both project’s certification criteria have certain demands which pertain to the Living in phase of the job. Enterprise Green Communities mandate that a building maintenance manual, which addresses maintenance schedules, must be created and the updated 2015 version expands this to include maintenance guidance. The most recent EGCC has a new category (8.2) for an emergency management manual which outlines how to respond to an emergency, pertinent for Carmel Place as it resides in zone 5 of the flood zone areas for New York City. More critically it is adjacent to and directly west of flood zone 1, the grounds of Bellevue hospital. A resident manual is also mandatory as is resident and property staff orientation. In addition, the 2015 version of the criteria states that it should encourage green and healthy activities in order for residents to fully appreciate the benefits that these design measures bring. Although the criteria refers to “green cleaning guidelines” the “green” focus is more specifically on energy efficiency and water conservation. The 2015 criteria expands the property orientation to include residents and staff in addition to the property manager. These areas of expansion in the EGCC are encouraging and it is our hope that the assessment and education of building products, and requirements for their maintenance, will become an increasingly significant part of the process for all stakeholders involved.

The governing body for LEED, USGBC, does require that Energy performance data is shared for 5 years beyond the completion of a project but it does not have the resources to monitor projects further. Although LEED status can be revoked if at any point the minimum program requirements are not being made. It is recommended to use green cleaning products but there are no recommendations for products, similar to chemical content in paints and sealants, the onus is on the owner to specify the products and to implement methods of cleaning and schedules. What makes Carmel Place currently unique in the arena of affordable housing developments in the city is the

partnership it had forged with Stage 3 Properties, which offer services and furnishings to the units that they manage, under the company name of Ollie (phonetic play on all-inclusive). Carmel Place has adopted a service package that accompanies the rentals, it is available to all residents but offered at cost (\$163/month) for the affordable units, and has been donated to the units for the formerly homeless veterans. It is a business model that has been developed over the past ten years by two brothers based in New York but operates nationally. They currently have four projects in progress and are evaluating a further 40. As part of the feasibility study for Stage 3 properties which the owners regard as a housing solution platform for rental units, they met with 400 developers over the course of two to three years, it was at this time that they first met Monadnock Development. In 2012 Monadnock Development reached out to Ollie to get involved in managing Carmel Place. “Bledsoe (owner) say’s Stage 3’s work on outfitting micro units isn’t just about living in a small space, but about living life well in a small space (Rhodes, 2015).”

For the developer, Ollie provides space layout, interior design, sources and installs furniture, leases and operates the space for them and the arrangement is either fee based or operates as a master lease model depending on the development and the degree that they are involved in the development. The mission of Stage 3 Properties is to provide a better quality of life on a personal level through the in-apartment services they offer - WiFi, Cable, furniture, and Housekeeping - weekly tidys and monthly deep cleans. They have also partnered with an app based service Hello Alfred that can also run errands such as laundry pick-up, grocery shopping and mailing packages. On the communal level Ollie offers events and get-togethers in the buildings within which they operate and between buildings, so that an Ollie member can join networking opportunities—pot luck dinners, games nights, outdoor activities—in other neighborhoods. Each building has a community manager who creates social programming to bring the residents together. Tenants also get membership to Mangnises, a club which caters to millennials offering curated social events, work spaces and reduced priced hotel rooms in different cities. This may be the one part of the package that could exclude some of the tenants as the member base for Mangnises is 21 to 35. It will be interesting to see as the company grows if the “all-inclusiveness” it promises will be all-inclusive to the residents!

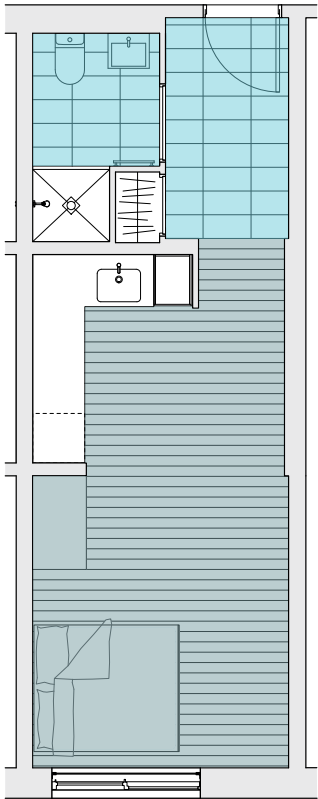


Right: Flood Plans (reference: nyc.gov/hurricanezones)





MATERIALS  
LIST



TYPE A (30 UNITS)  
302 SF (VARIES)  
not to scale

The Material List	Location
<div>1. WOOD Division 6<ul style="list-style-type: none"><li>. Engineered Wood Flooring: Kars, Serrant County, Ash</li><li>. Wood Flooring: Kaswell, Micro edge grain, Maple</li><li>. Wood Base: Poplar, painted</li></ul></div> <div>. Solid Wood Sill: Maple, Satin Poly to match adjacent flooring</div> <div>. Wall Paneling: Kaswell, Prefinished Ply-Type w/2-6-1</div> <div>. IPE Roof Pavers, Tile Tech Pavers, Natural Wood</div>	<div>1. WOOD Division 6<ul style="list-style-type: none"><li>. Typical Habitable Space &amp; Kitchen Floor</li><li>. 8th Floor Community Room Floor</li><li>. Ground Floor residential Recreation Space</li><li>. Ground Floor Residential Recreation space, typical Unit Kitchen, Habitable space, Entry area and closet to all apartments, *th Floor Community Room</li></ul></div> <div>. Cellar Residential Recreation Space, Ground Floor Foyer &amp; Lobby Walls</div> <div>. 8th Floor Exterior</div>
<div>2. PLASTICS AND COMPOSITES Division 10</div>	<div>2. PLASTICS AND COMPOSITES Division 10</div>
<div>3. THERMAL AND MOISTURE PROTECTION Division 7<ul style="list-style-type: none"><li>. Insulation: Foamular 400/600/1000 XPS rigid foam insulation, Johns Manville Unfaced/Foil Faced Formaldehyde Free Fiber Glass Insulation Enhanced with Bio Based BindeR, Thermafiber Continuous Insulation Rain Barrier 45</li></ul></div>	<div>3. THERMAL AND MOISTURE PROTECTION Division 7</div>
<div>4. FINISHES - Wall Boards Division 9<ul style="list-style-type: none"><li>. Wall/ceiling/Damp/Wet Location Gypsum Board: Gold Bond Brand EXP Sheathing,</li><li>. Wall/Ceiling Gypsum Board: Wall Gold Bond Brand Fire Shield Gypsum</li></ul></div>	<div>4. FINISHES - Wall Boards Division 9<ul style="list-style-type: none"><li>. Throughout</li><li>. Throughout where fire wall needed</li></ul></div>



The Material List	Location
<div>5. FINISHES - Tiles + Sheet Flooring + Carpet</div> <div>Division 9</div> <div>. Carpet Tile: Tretford, Carpet Roll, 538/Silver Birch</div> <div>. Carpet Tile: Tretford, Carpet Roll, 523/Larch</div> <div>. Gym Flooring: Expanko, Reztec, Rubber, Velocity, Roll</div> <div>. Tile - Wall: Units Bathrooms, Tile Depot, Soda, Ceramic, White</div> <div>. Tile - Floor: Units Bathrooms, Nemo tile, Twill, Porcelain, Graphite</div> <div>. Tile - Floor: Units Bathrooms, Nemo Tile, Materla Project, Porcelain, Nero</div> <div>. Tile-Wall: Public WC, Nemo tile, Materla project, Porcelain, 04 Bark</div> <div>. Tile - Wall/Floor: Utility, Daltile, P125, Porcelain, Pure White</div> <div>. Tile Floor: Ground Floor, Nemo Tile, Materla Project, Porcelain, 01 Bark</div>	<div>5. FINISHES - Tiles + Sheet Flooring + Carpet</div> <div>Division 9</div> <div>. Floors 2-9 Typical Corridor Floor</div> <div>. Floors 2-9 Typical Corridor Floor</div> <div>. Ground Floor, Residential Recreation Space,</div> <div>. Typical Bathroom, Wall</div> <div>. Typical Unit: Habitable Space, Floor, Bathroom, Floor, Entry Area &amp; Closet</div> <div>. Typical Unit Bathroom</div> <div>. Ground Floor WC</div> <div>. Cellar, Floors 2-9 Typical Conditions: Refuse Room Floor, Walls</div> <div>Ground Bathroom Floor</div> <div>. Cellar Public Corridor, WC and Recreational Space</div> <div>Ground Floor Lobby, Reception, Package and Storage Rooms</div>
<div>6. SPECIALTIES</div> <div>Division 10</div> <div>. Entry Mat/Grating: CS Pedi System, Pedimat, Aluminum, Carpet inset: Tan</div> <div>. Wallpaper: Flavor Paper, Vapor, Silver Mylar wallpaper, Silver</div> <div>. Wallcovering: Koroseal, Patty Madden, Zircon LXS-ZIR, 27 Steele</div> <div>. Wallcovering: Koroseal, Patty Madden, Sazi Texture LXB-SZT, 06</div> <div>. Back Painted Glass, ¼” Low-Iron Temp Glass, paint</div> <div>. Painted GWB-Walls, PC1</div> <div>. Painted GWB-Ceilings, PC1</div> <div>. Painted GWB-Walls, PC2, PC9</div> <div>. Painted CMU Block, PC1</div>	<div>6. SPECIALTIES</div> <div>Division 10</div> <div>. Foyer Ground Floor</div> <div>. Ground Floor: Lobby Walls</div> <div>. Cellar: Public Corridor Walls</div> <div>. Typical Unit Kitchen Walls</div> <div>8th Floor Community Room: Walls</div> <div>. Cellar, Ground Package &amp; Storage Room Walls, Typical Unit: Kitchen,Habitable Space, Entry Area &amp; Closet Walls</div> <div>8th Floor: Community Room Walls</div> <div>. Cellar, Ground Floor, Typical Unit</div> <div>Floors 2-9 Typical Corridor &amp; Refuse Room Ceiling</div> <div>8th Floor Community Room Ceiling</div> <div>. Ground Floor Foyer, Lobby, Residential Recreation Space &amp; Retail Walls. Floors 2-9 typical Corridor Walls</div> <div>. Cellar</div>

The Material List	Location
<div>7. FURNISHINGS</div> <div>Division 12</div> <div>. Fiberglass Planters: Chandler, Contemporary Rectangular Planter, Fiberglass, Silver/Grey</div> <div>. Vinyl Upholstery: Designtex, Alchemy 3353</div>	<div>7. FURNISHINGS</div> <div>Division 12</div>
<div>8. MASONRY</div> <div>Division 4</div> <div>. Engobe Utility Brick, Clen-Gery, Engobe Brick, White, K08-6008 Smooth &amp; Velour</div> <div>. Engobe Utility Brick, Clen-Gery, Engobe Brick, Light Grey, K12-3009 Smooth &amp; Velour</div> <div>. Engobe Utility Brick, Clen-Gery, Engobe Brick, Dark Grey, K12-3008 Smooth &amp; Velour</div> <div>. Engobe Utility Brick, Clen-Gery, Engobe Brick, Black, K13-3063 Smooth &amp; Velour</div>	<div>8. MASONRY</div> <div>Division 4</div> <div>Facades</div>
<div>9. METAL</div> <div>Division 5</div> <div>. Painted Steel Decking, PC3, PC4</div> <div>. Metal Soffit: Powder Coated Aluminum</div> <div>. Aluminum Planter, ” Powder Coated Aluminum</div>	<div>9. METAL</div> <div>Division 5</div> <div>. Cellar</div>
<div>10. OPENINGS</div> <div>Division 8</div> <div>Windows: Winco Windows 1150 Series 2” and 4” Thermal fixed and projection window</div> <div>Door: Winco NC STH Superthermic Terrace Door 3410 Series 4” Thermal Fixed and Slider Windows</div>	<div>10. OPENINGS</div> <div>Division 8</div> <div>Windows &amp; Doors</div>
<div>11. EXTERIOR IMPROVEMENTS</div> <div>Division 32</div> <div>. Brick Pavement, red, Reclaimed on site or match existing</div>	<div>11. EXTERIOR IMPROVEMENTS</div> <div>Division 32</div>
<div>12. CONCRETE</div> <div>Division 3</div> <div>. Epoxy Painted Concrete, Concrete</div> <div>. Sealed Structural Slab</div>	<div>12. CONCRETE</div> <div>Division 3</div> <div>. Cellar</div> <div>. Cellar, Bulkhead Mechanical Room &amp; Elevator Control Room Floor</div>



# MATERIALS LIST

## WHAT WORKS

	PRODUCT	LOCATION	PROPERTIES	COMMENTS
FACADES	Glen-Gery Brick	Facade of the building. In the following colors- White, Light Grey, Dark Grey, Black.	LEED NC v3 Credits	
INSULATION	Johns Manville Unfaced Foamular	Fiberglass Insulation: where there is 1" mineral wool on the exterior of the wall	Formaldehyde-free, made of long, resilient glass fibers bonded with bio-based binder, 30% post consumer recycled content, Green Guard Gold Certified.	Product is not LEED certified
PAINTS	Benjamin Moore Ultra Spec 500	Interior Unit Walls and Ceilings, Corridor Walls, Bike and Tenant Storage Ceiling, Doors and Frames Aluminium Soffit	Cradle to Cradle Certified Silver qualifies for LEED v4 Credit Zero VOC	DUNN EDWARDS is a similar paint which is Ethylene Glycol free and is a LEED gold certified manufacturing Facility but not as affordable as Benjamin Moore.
TILES	Merola Tile Soda Blanco	Apartment Unit Bathroom Walls.	Concerns: glazes may contain heavy metals, importing from Thailand requires additional transportation	DAL TILE is a locally produced ceramic tile with LEED certification. Soda Blanco is now discontinued.
WALLPAPER	Flavour Paper Silver Mylar Wallpaper	Silver Wallpaper	PVC-free, FSC certified, 10% recycled content, locally produced in Brooklyn.	Investigate chemical content of dyes used in wallpaper.
	Koroseal Patty Madden Zircon, Sazi Textures	Steele and Tuxedo Grey Wallpaper	Contains recycled content	Product is not LEED certified.
ADHESIVES	The Zinsser Co. Sure Grip Plus Mold and Mildew-Proof Commercial Wall Covering	Adhesive used for installing wallcoverings.	This product helps prevent Mold and Mildew.	Investigate chemical content added to make the adhesive mold and mildew proof is advised. This product is not LEED certified.

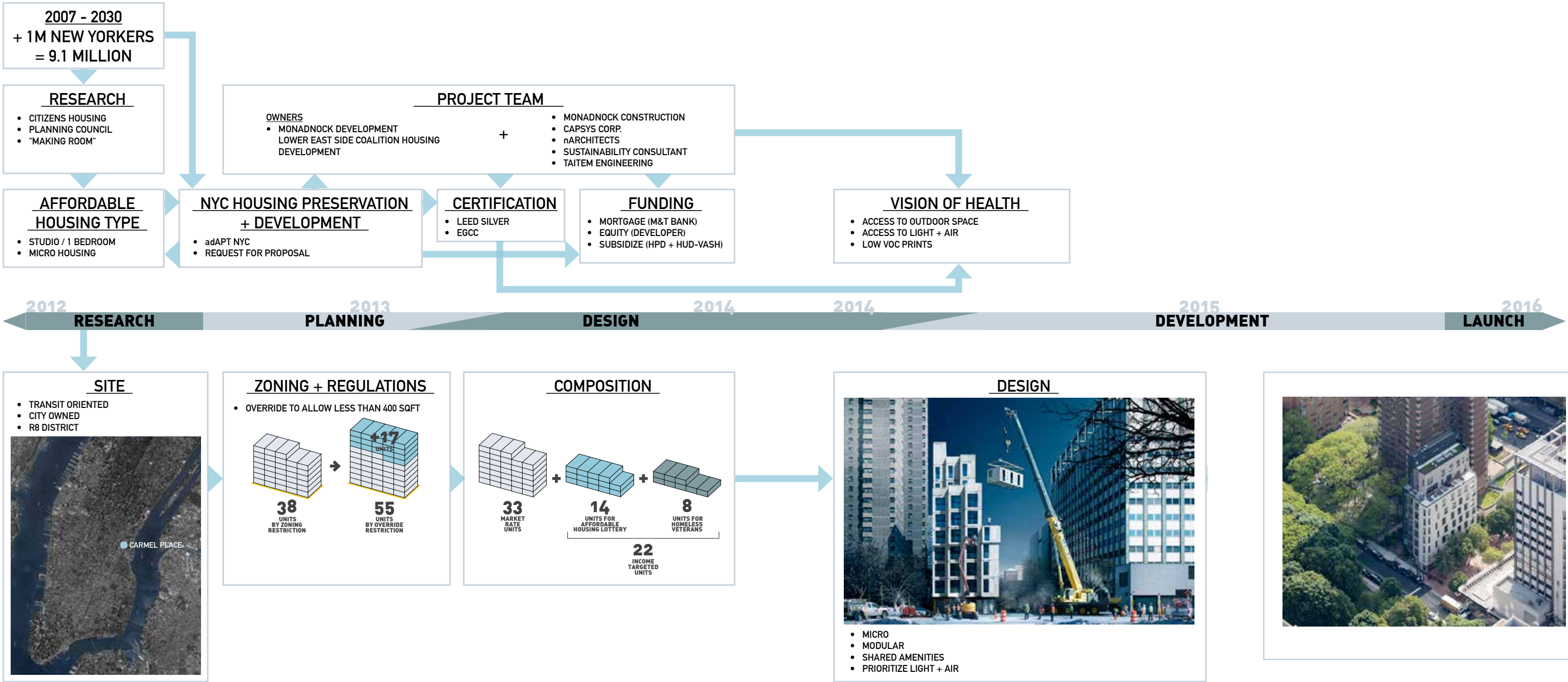
	PRODUCT	LOCATION	WHAT WORKS	COMMENTS
WOOD	Kars- Serrant County Engineered Wood Strip Flooring	Within the Apartment Units- Living, Kitchen and Hall	"Woodlock" connection avoids adhesive, Low VOC	Using a "Woodlock" connected flooring throughout- such as Kars is recommended. Kaswell's T&G connection requires additional adhesive for installation.
	Kaswell- Micro Grain Edge Engineered Wood Flooring	Game Room and Lobby	Forest Stewardship Council Certified.	
STONE	Pental Quartz Engineered Stone	Kitchen Counter Tops	Green Guard Gold Certified	This product is made in China. A locally quarried granite would be a better alternative.
CARPET	Tretford 538 Silver Birch	Carpet	Low VOC. The product uses phthalate-free PVC and the manufacturers have very low wastage.	Shaw is an good local alternative.
UPHOLSTRY	Designtex	Vinyl Upholstery	There are no certifications for this product.	In general, using Vinyl is not recommended
EXT. FLOOR	Tile Tech Pavers IPE Deck Tiles	8th Floor Exterior	The product can be left unfinished in its natural state to weather to a silver grey color.	IPE is a threatened species.



SECTION 8

# CONCLUSION

8a. Mapping the Process







## 8b. Strategies for building healthier, affordable housing in New York City.

Affordable Housing in New York City is a genuine struggle for people living in poverty. It is critical to keep the stories of all of the NYC residents that struggle to find and maintain their homes at the forefront. We must not lose sight of the living conditions that should be a right to each of them. To do this, we must expand the notion of health; encompassing the health of the neighborhood, the health of the individuals, of every age, who inhabit each unit and the surrounding built environment. Healthier building design decisions should join the list of essentials when creating all housing- daylight, air, access to transportation, access to green space and creating an active building environment. Design and the materials that we employ must meet the aspirations of all groups regardless of social standing and economics. As in the case of Carmel Place, changes need to be made through a collaborative effort from all levels through better policy, planning, design, and material choices. The following five broad takeaways should be considered while planning healthier affordable housing in New York City.

### Changing Policy and Zoning Regulation

The location of Carmel Place is crucial for an affordable housing project. Locating the building in a neighborhood with access to public transportation, healthcare, and open spaces is vital. Carmel Place is a compelling example of forward thinking in the City's re-examining of the current zoning regulations to accommodate more homes for the working poor and underserved city residents providing access to better jobs and a healthier neighborhood. Council Member Mendez should be commended for her advocacy for low-income residents and particularly the formerly homeless veterans to be accommodated in this project and it is this dedication by City officials which will help ensure that the most vulnerable members of society can have these opportunities.

### Avoiding Environmental Jargon

To incorporate the best building materials and product alternatives certification becomes a key factor. It is currently the only driver unless the criteria are prescribed by the developer or funder of a project, to ensure that materials and products are considered in a way that is meaningful to human health. The vague language around environment-friendly building products and unclear details of their certification on websites are definitely discouraging. For an affordable building project to be healthy in 2019, conscious time and effort need to be undertaken by architects and designers to research and specify better building products.

### The Cost Paradox

Most building products that are healthy and certified tend to be more expensive. The demand for healthier products shows an immediate increase in the cost of the product putting affordable housing in a tight spot. For a building to be healthy and affordable, picking expensive products is not the only solution. Informed design decisions whether it is water-based finishes for the furniture, porcelain tiles in the bathroom to the day-lit stairwells and open communal spaces accumulate to provide a healthier environment.

### Stakeholder Collaboration and Innovation

Innovation has been central to this case study, and it is clear that for this level of innovation to be realized, a collaboration between all stakeholders was essential. From trying to use prefabricated shipping containers to changing laws and regulation for rezoning the land to the architect's effort to be sensitive with their design, it all adds up to a well-designed building product. While it was not prescribed that this be the healthiest built project, it is evident that the architects focused on health and well-being in a manner that translated, collectively, into astute choices throughout the development.

### Changing the Identity of Affordable Housing

nArchitects brought in their perspective to designing for modular housing and the material choices, thinking in terms of a cohesively well-designed building and not framing it as a typical 'affordable' housing project where lesser materials might be used. Instead, the architects' used products they typically specified. For a project that has a 40 percent affordable housing component, the same materials and finishes have been used throughout the housing. Also, so that the building is more cohesive as a whole, regulations also include requirements for fair distribution of views, access to shared spaces and appliance of equal sizes. These small design decisions go a long way in creating social equity within these projects.

It is heartening to note that a city with such pressures on affordable housing over the course of its history continues to evaluate what can be done to serve all of its citizens equally. Innovation, stakeholder collaboration and conscious effort from the designers is the call of the hour. The work for healthier affordable housing is just beginning and demands the same dedication from all sectors from manufacturing to installation.





## SECTION 9

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