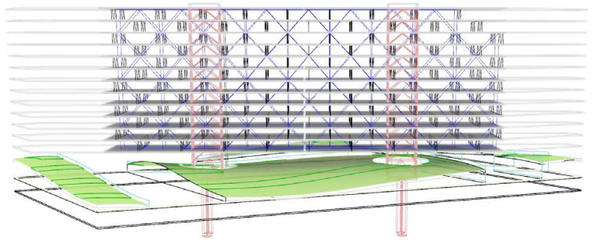
Design Vision

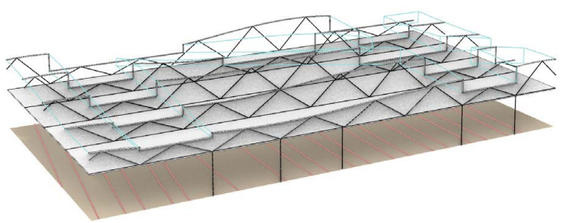
Our network of interconnected mixed-use superstructures acknowledges the technical criteria and varied geometries of the rail lines and neighboring communities as a fundamental first step in envisioning an economically feasible and spatially responsive merging of disparate neighborhoods.

Interlocking spatial Vs frame an array of four well-scaled community spaces (averaging 250 feet in width and 600 feet in length), while creating a lively interplay of opposing vistas to and from Long Island City and Sunnyside communities adjoining the site to the north and south respectively.

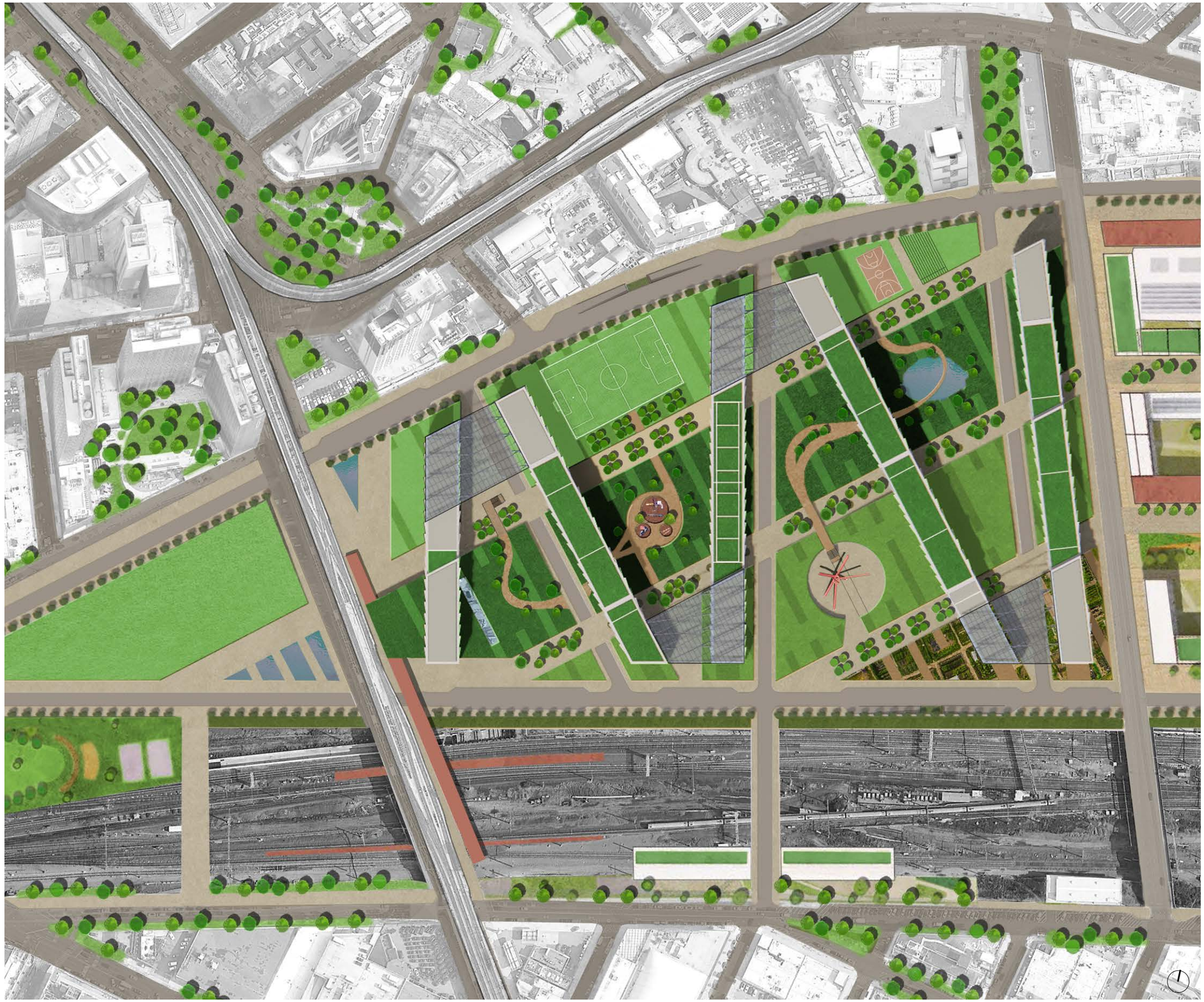
Passing uninterrupted below the proposed super-structures, a series of three ground level pedestrian paths fold the SYMPH planning module to traverse the site and similarly connect the adjoining development sectors to the east and west while providing primary access to the neighborhood's rich array of ancillary community support programs.



SUPERSTRUCTURE CONCEPT



DECK STRUCTURE CONCEPT

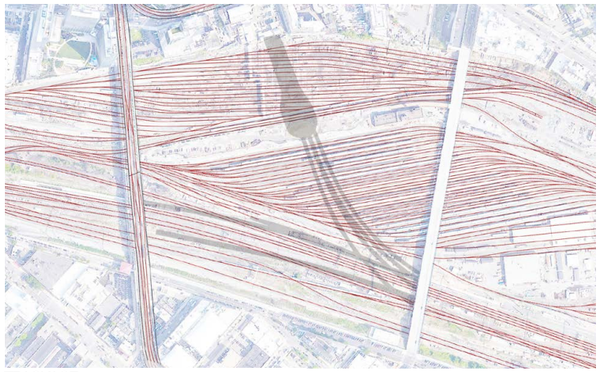


OVERALL SITE PLAN

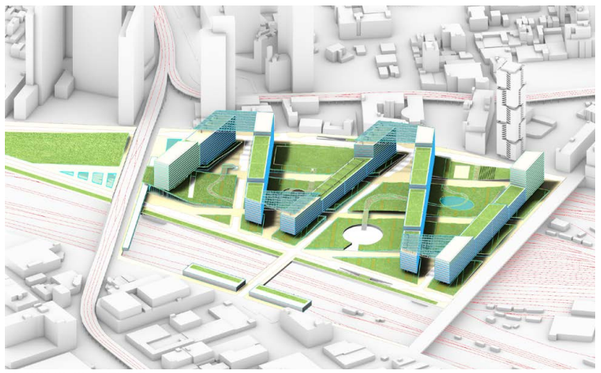
Urban Fabric

Like textiles, urban fabric comes in many different types and weaves; it is the physical texture of an urban area. Here five interconnected “horizontal skyscrapers” and four undulating landscape bands traversed by pedestrian and vehicular streets—which parcel the bands in roughly east-west and north-south directions, respectively—create a multidimensional assembly bridging over Sunnyside Yard below.

This two-pronged approach provides opportunity for varied mixed-use programming and social interaction to create a richly layered fabric of residential, institutional, civic, and commercial programming appropriate for a new urban transportation node.



TRACKAGE



MASSING OVERBUILD

SUPERSTRUCTURE

SOLAR CANOPIES & ROOFTOPS

- Renewable energy generation
- Outdoor play
- Extensive and intensive green roofing

HORIZONTAL “SKYSCRAPERS”

- Affordable housing
- Hospitality
- Schools
- Commercial office

PLATFORM DECK

LANDSCAPED TOPOGRAPHY

- Recreation and sport venues
- Eco Lab and wastewater management
- Public open space and Art park
- Urban farming
- Carbon sink and compost sequestration

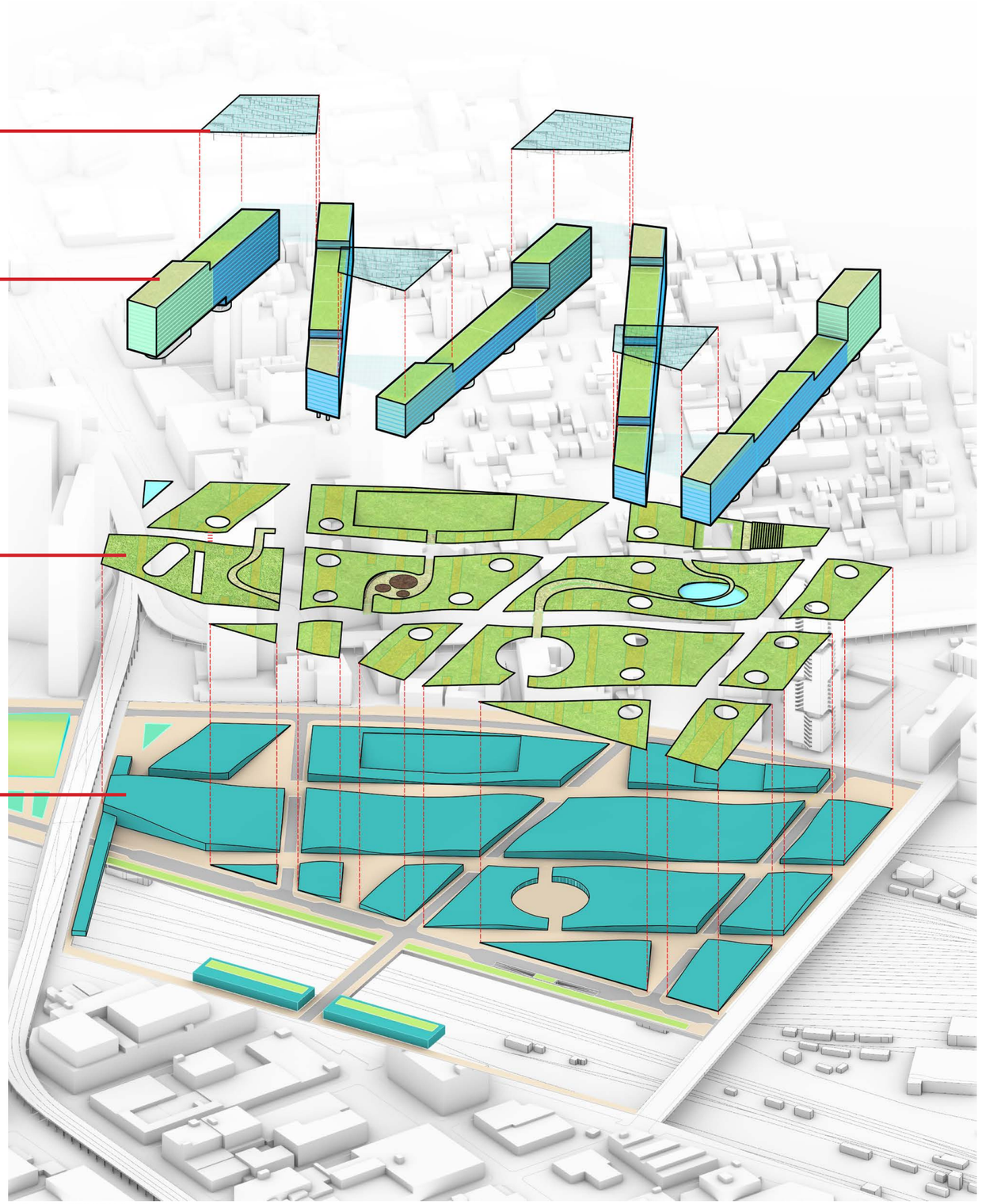
CIVIC PROGRAM

SOCIAL INFRAESTRUCTURE

- Healthcare
- Childcare
- Community support
- Information Access
- Waste management and recycling station
- Public safety
- Transportation

COMMERCIAL ENTERPRISE

- Retail
- Arts and cultural institutions
- Co-working and remote working support
- Light industrial
- Below “grade” parking



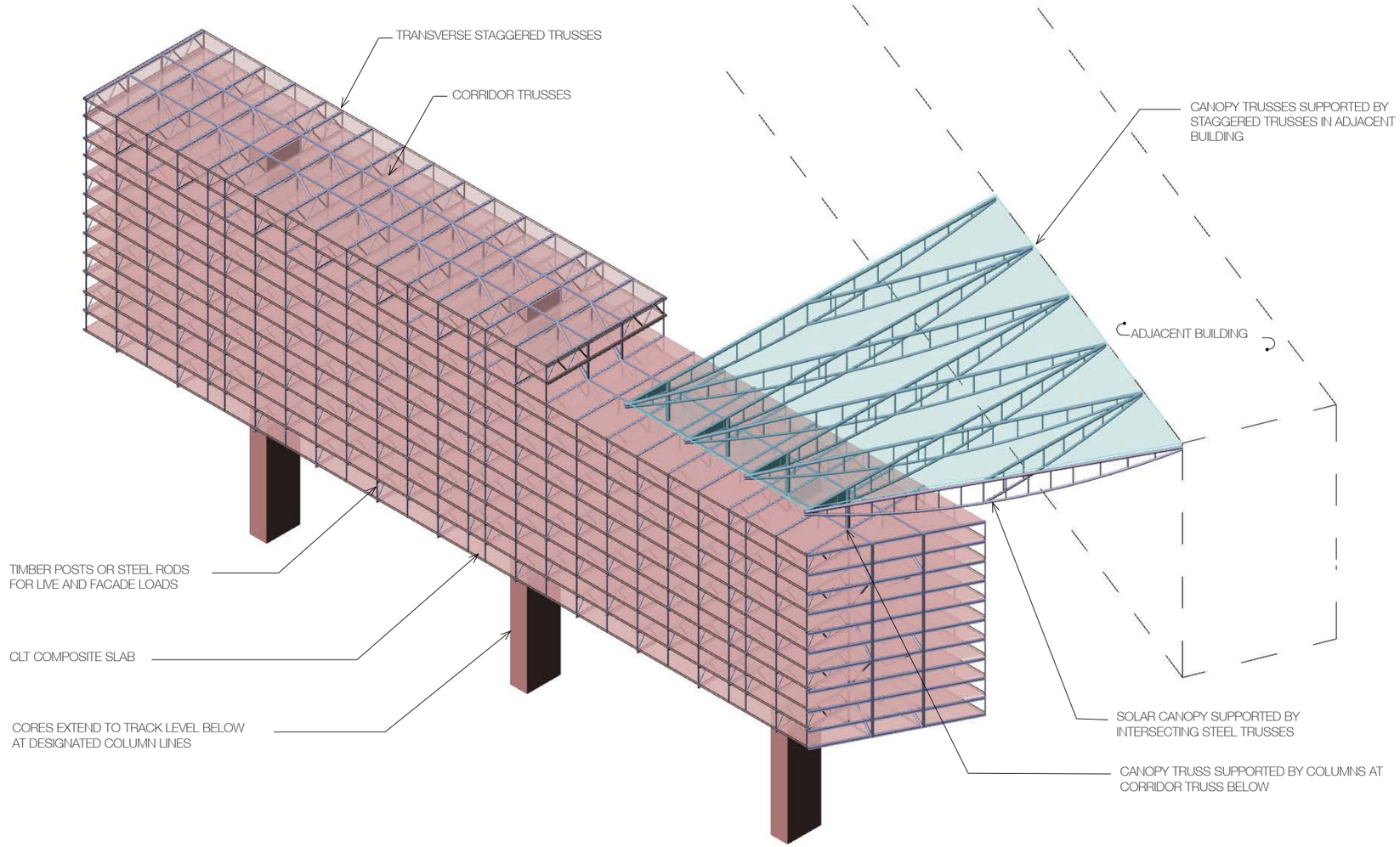
EXPLODED PROGRAMMATIC AXO

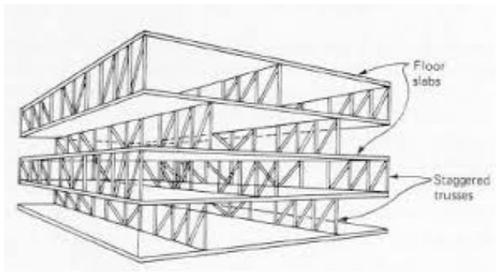
Superstructure

The overbuild system consists of a series of trusses integrated within the platform deck. Primary deck trusses spaced 60 feet on-center extend the full height of the platform deck, allowing for a deep structure and material efficiency. These trusses are supported by columns that land between tracks at the designated column lines.

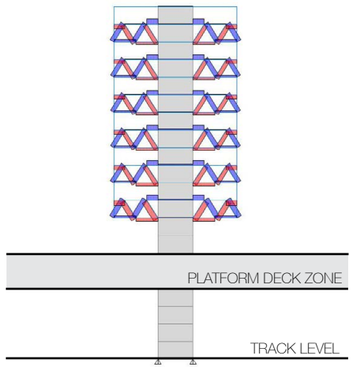
The lower part of the system carries a parking level, framed by the primary trusses and horizontal plate girders supporting a concrete-on-metal deck floor system. The upper part of the structure houses commercial and community spaces and supports the overhead green roof, the top chord of the truss curved to follow the landscape typography. Truss diagonals are spaced so as not to interfere with these programs. Where the depth of the platform deck only allows for landscape, truss diagonals are clad in CIP concrete to protect the steel from surrounding soil.

At locations where breaks in the landscape occur to allow for pedestrian and vehicular pathways, the primary truss depth is reduced. However, at certain locations the primary trusses emerge from the landscape to support overhead bridges. The adaptability of the deck truss system allows for a unique system that fits itself to the requirements of the program while maintaining material efficiency and ease of construction.

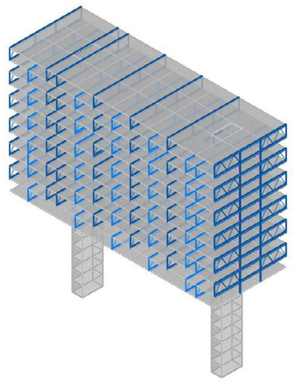




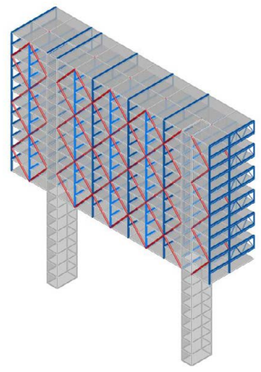
STAGGERED TRUSS SYSTEM



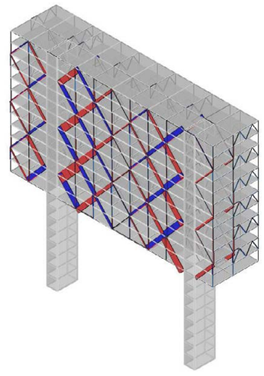
STAGGERED TRUSS AXIAL FORCES



STAGGERED TRUSS SYSTEM

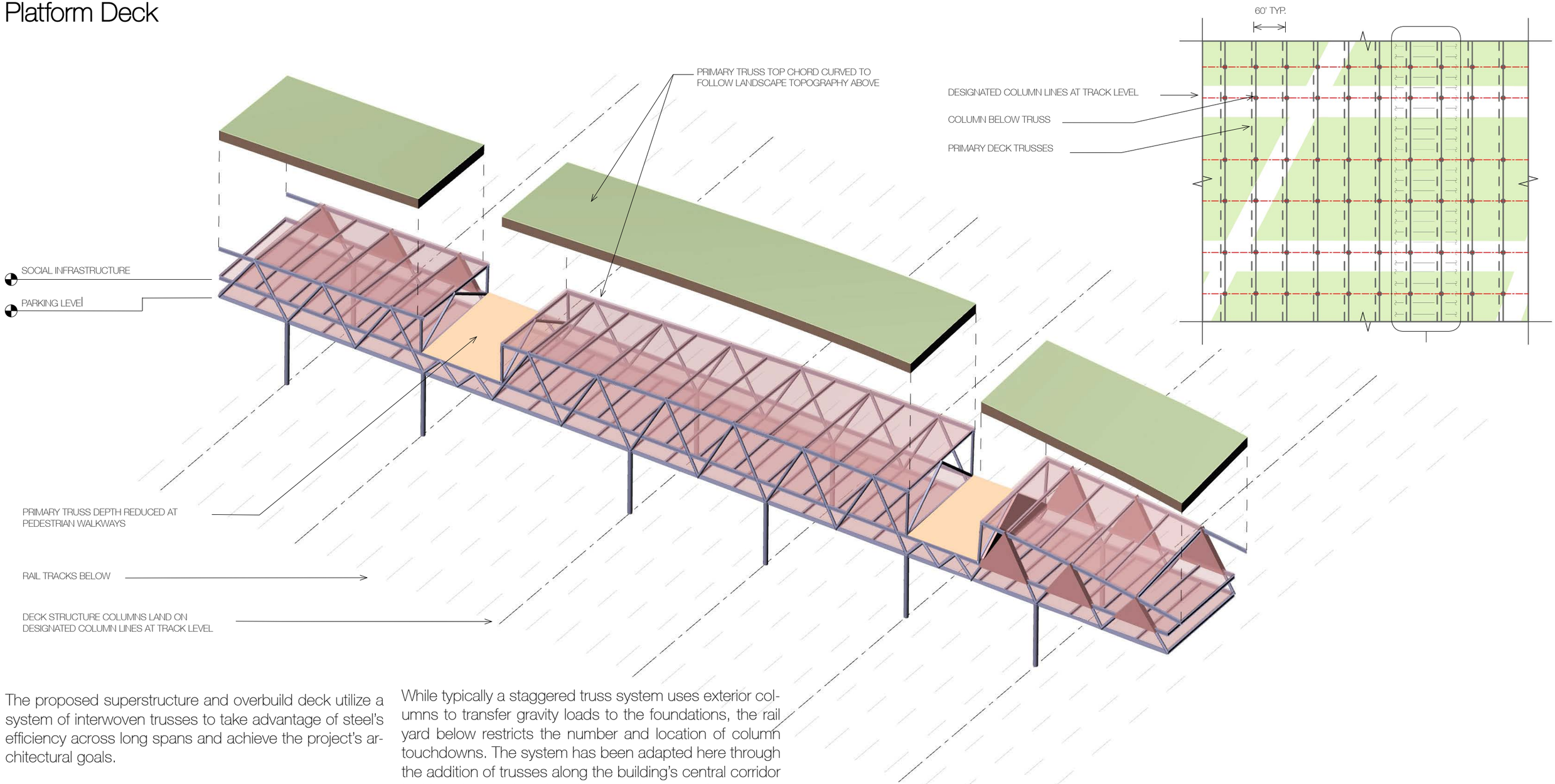


CORRIDOR TRUSS



CORRIDOR TRUSS AXIAL FORCES

Platform Deck



The proposed superstructure and overbuild deck utilize a system of interwoven trusses to take advantage of steel's efficiency across long spans and achieve the project's architectural goals.

The superstructure of the "horizontal skyscrapers" features a staggered truss system, a concept first developed by William LeMessurier in the 1960s. Story-high trusses staggered every other column line support gravity loads, thereby avoiding the use of interior columns and allowing for large uninterrupted interior space. The staggered truss system has been deployed on construction sites throughout New York City, notably at the Conrad Hotel in Lower Manhattan.

While typically a staggered truss system uses exterior columns to transfer gravity loads to the foundations, the rail yard below restricts the number and location of column touchdowns. The system has been adapted here through the addition of trusses along the building's central corridor that transfer load from the staggered trusses to the building cores, located at designated column lines and extending to track level. This adaptation also creates the impression that the buildings are floating above the landscape.

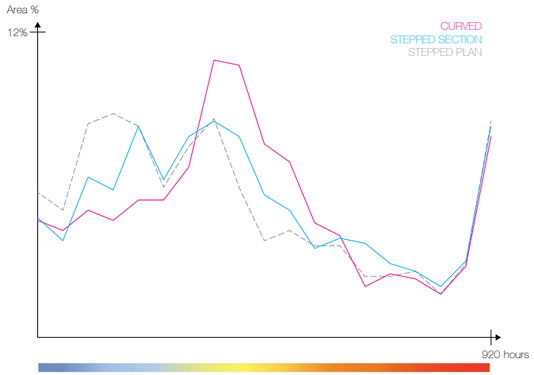
While the full dead weight of the structure will be carried by the staggered and corridor trusses, the ends of the staggered truss will be connected via timber posts to distribute live loads and tie the floors together. Alongside the CLT floor system, this use of timber takes advantage of steel's compatibility with wood to create a more sustainable structural system.

Steel trusses are also featured at the solar canopies between buildings. These lightweight trusses employ thin pipe sections and cables to support the canopies without interfering with the surrounding landscape.

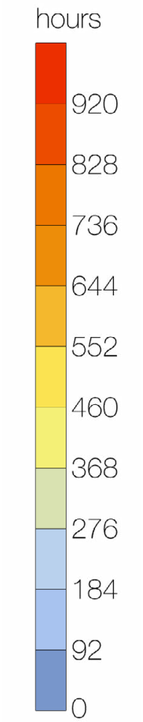
Daylight Performance

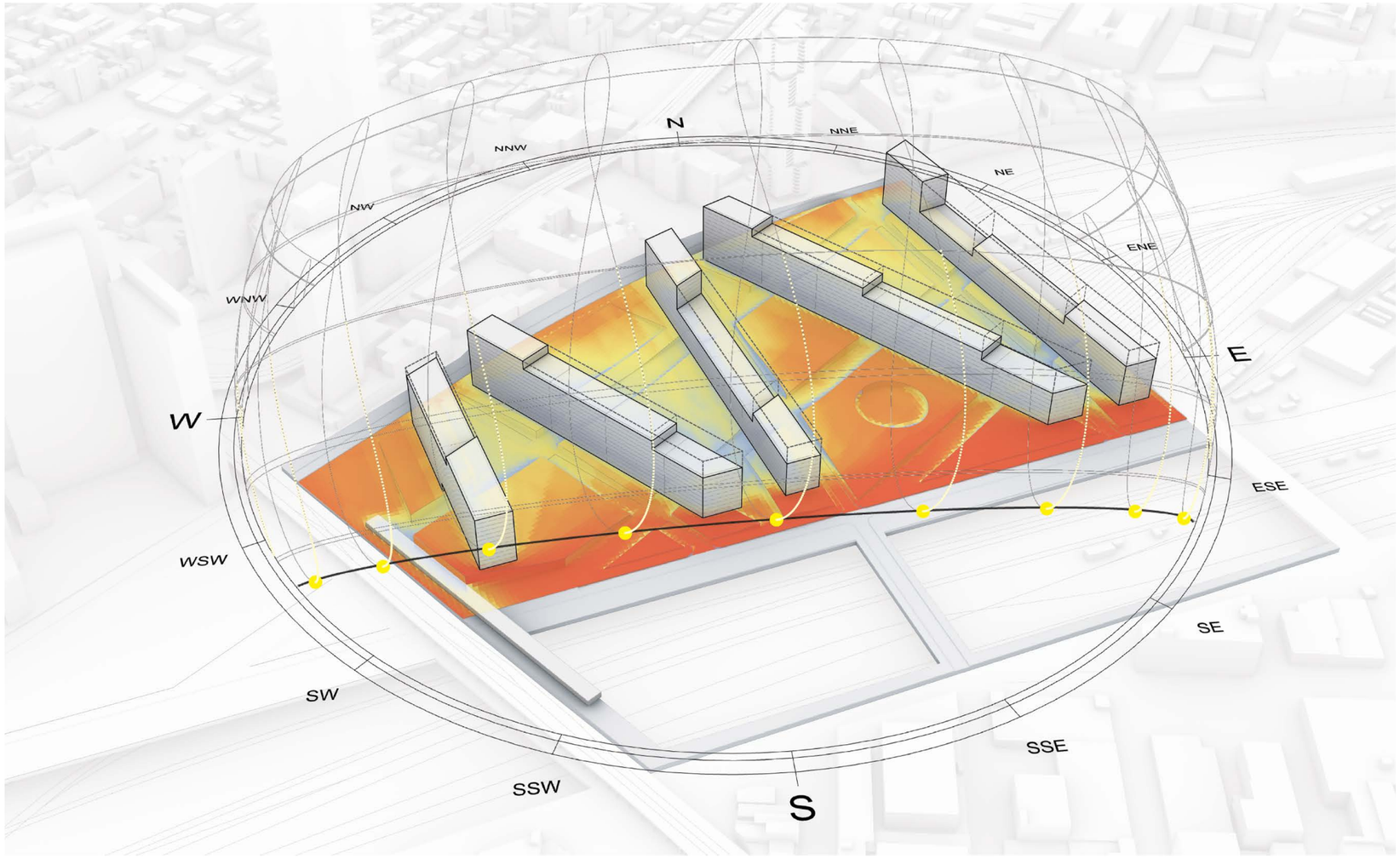
The analytics undertaken pusue the determination of an optimal building orientation, with an adecuate distribution of solar radiation, while allowing the maximum possible daylight hours on the public landscaped topography. To this end, iterative massing variants were analyzed with respect to hours of daylight solar penetration mapped on the landscape. While the calculated differential between analyzed schemes was modest, the massing selected for final documentation had a significative performative increase over the comparable baseline metrics.

Extensive areas of the landscaped site will have the potential to perform as carbon sinks. The public landscaped areas covering the social infrastructure and commercial program at street level, as well as the urban farming allocated on the green rooftops, accumulate and store carbon-containing compounds, neutralizing the overall impact of the intervention throughout its life cycle.

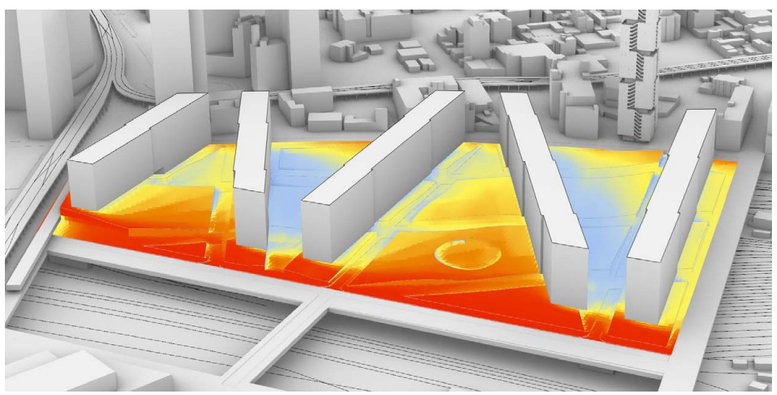


AREA DISTRIBUTION PER SCHEME

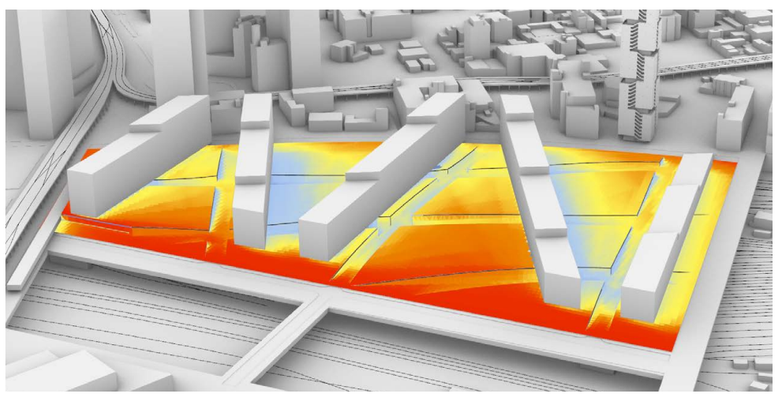




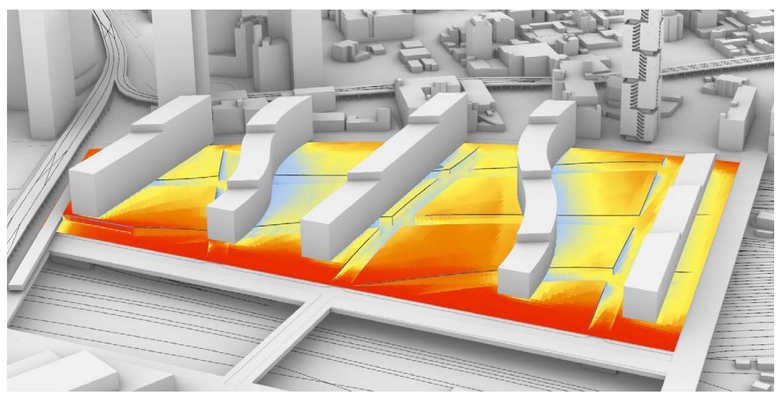
FINAL SCHEME, +7.8% hrs



STEPPED PLAN SCHEME, +0.0% hrs



STEPPED SECTION SCHEME, +7.5% hrs

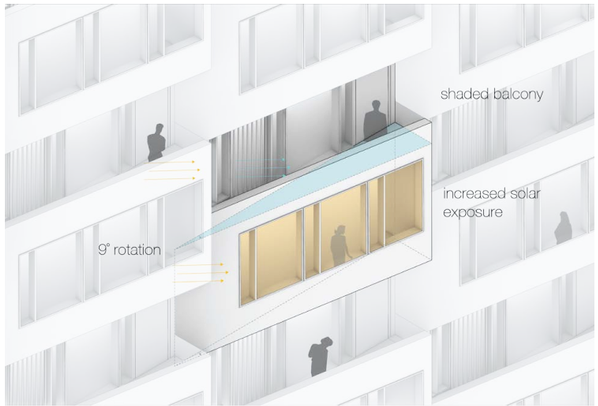


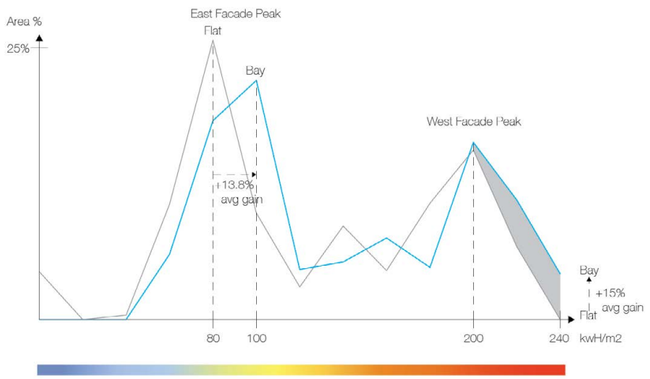
CURVED SCHEME, +9.3% hrs

Radiation. Surface Optimization

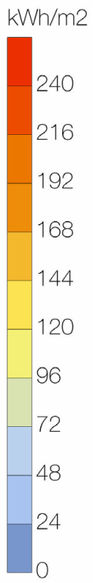
Quantitative analysis also demonstrates that incorporating bay windows on the southwest- and southeast-facing facades, creating a checkerboard pattern, will improve thermal performance in both heating and cooling conditions on the primary facades of the superstructure program.

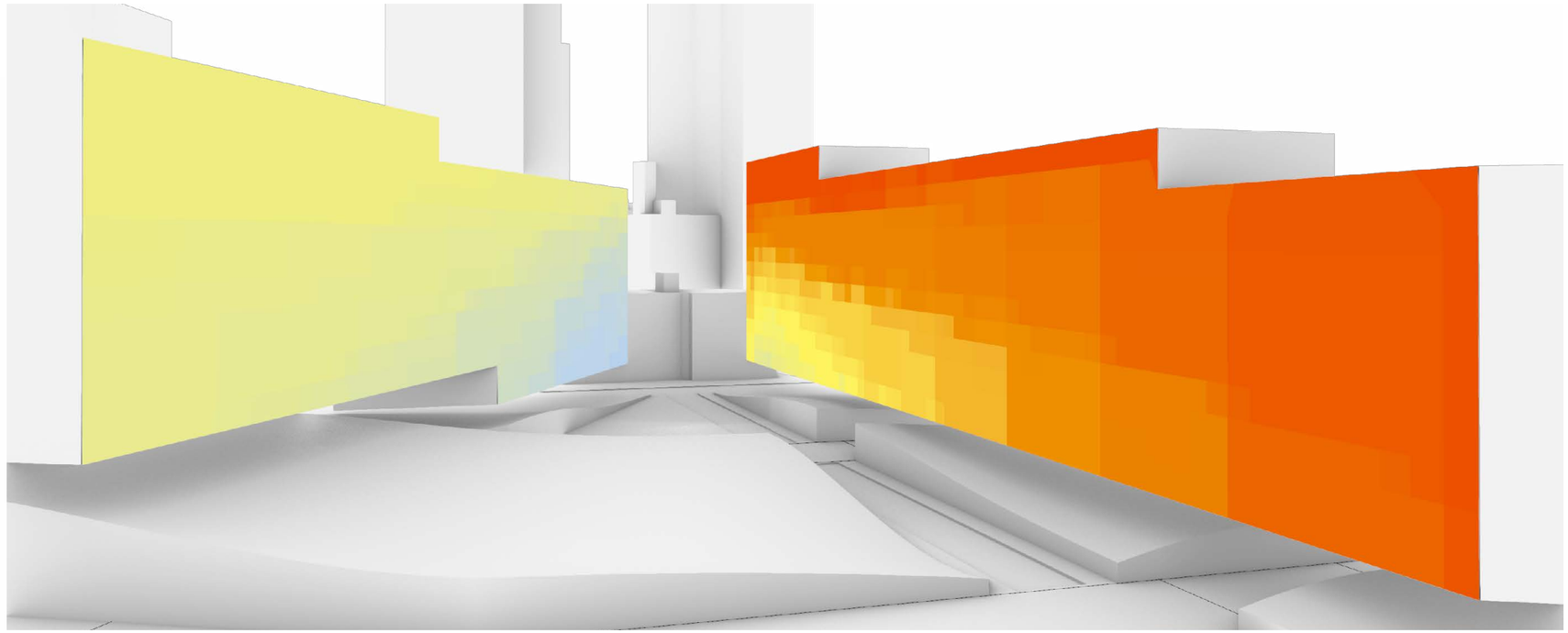
The inherent benefits of the bay windows—increased daylighting in winter and shading in summer—are complemented by the clean energy generation of four rooftop canopy solar arrays. This renewable energy source significantly offsets the annual energy consumption of the project by powering the public infrastructure and accessible roof gardens and terraces across the site, a key metric with respect to the sustainable resiliency of the complex.





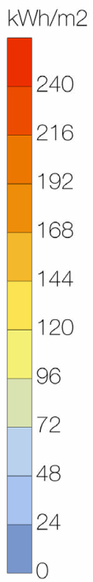
AREA DISTRIBUTION OF SCHEMES BY RADIATION

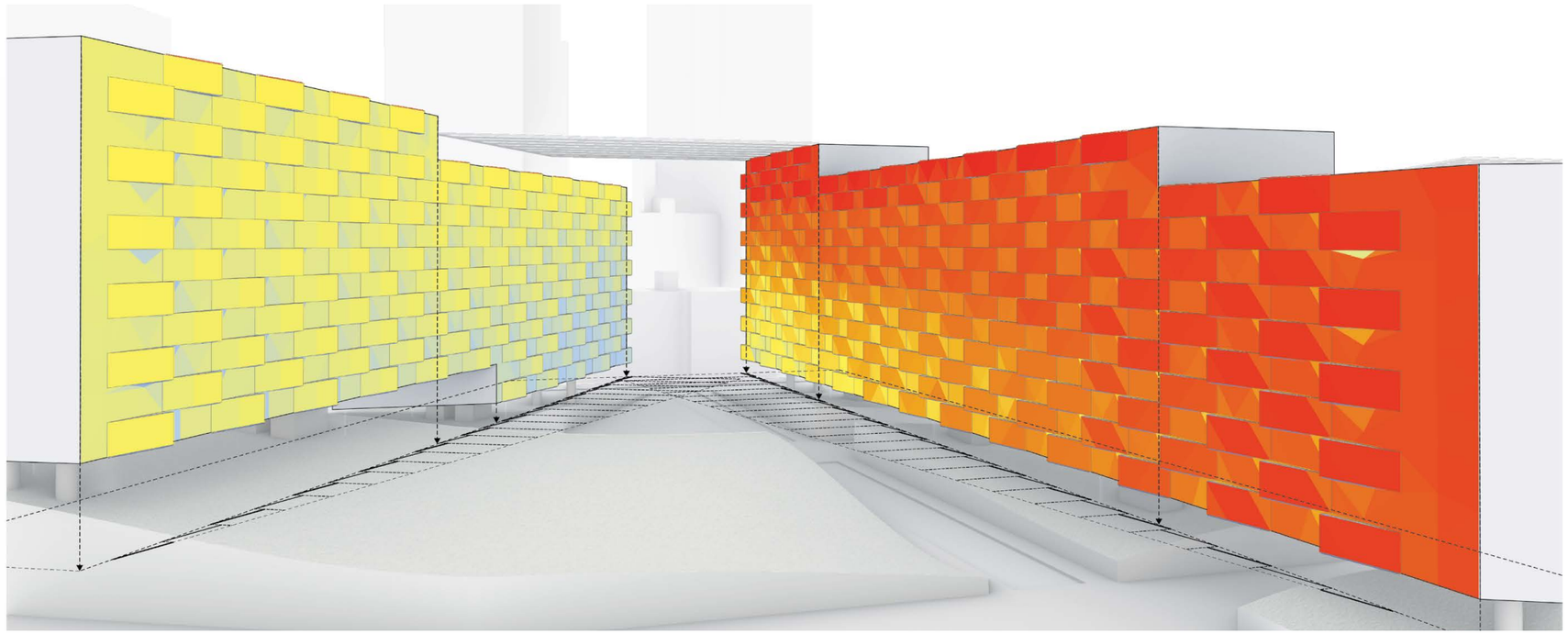




BASE SCHEME, +0.0 %

AVG: 118.76 kWH/m2

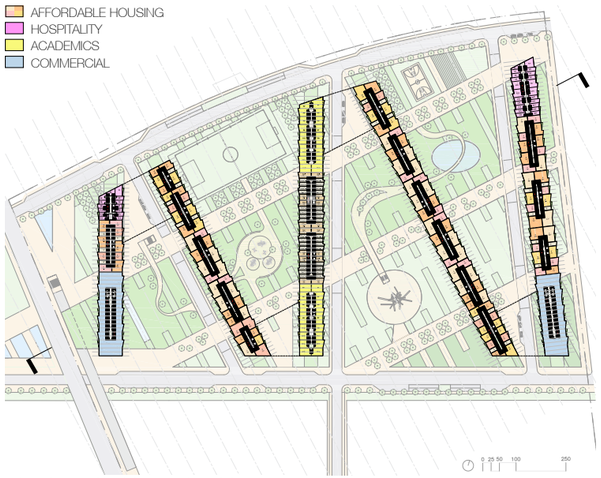




BAY WINDOWS SCHEME, +14.6%

AVG: 136.09 kWH/m2

Program Optimization



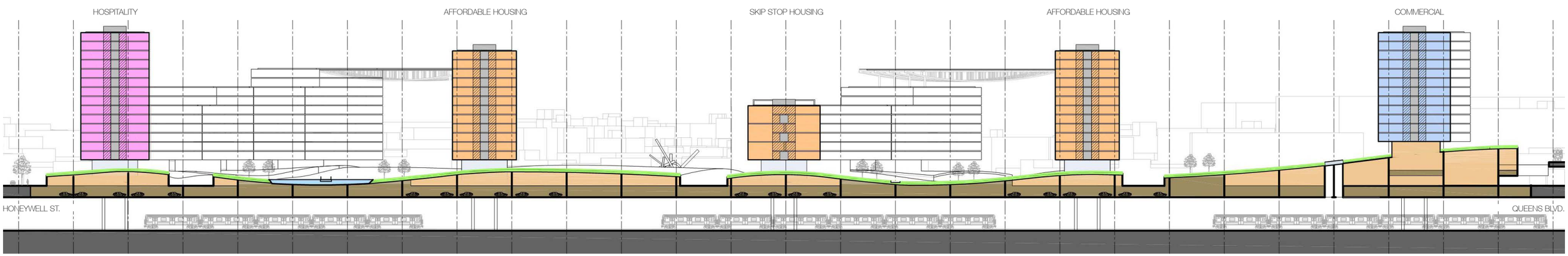
HORIZONTAL SKYSCRAPERS PROGRAM

-15 RESIDENTIAL BUILDINGS
-2 HOTELS
-2 SCHOOLS
-2 OFFICE BUILDINGS

The Design Challenge invites us to envision the optimal mix of residential housing and community services that will make phase 1 of the SYMPH a viable community.

In response, our proposed superstructures provide a development module with equal and repetitive efficiency and sufficient volume to provide a core program of 15 affordable housing buildings, comingled with commercial office (2), hospitality (2), and academic institution (2) parcels floating above a ground level layer of social infrastructure and commercial program. The density and mix outlined in our vision statement will generate social, economic, and commercial synergies, serving as the backbone for a vibrant 24/7 neighborhood.

LANDSCAPED TOPOGRAPHY



SECTION EAST-WEST

Streetscape and Landscape

LANDSCAPED TOPOGRAPHY PLAN

GROUND LEVEL PLAN

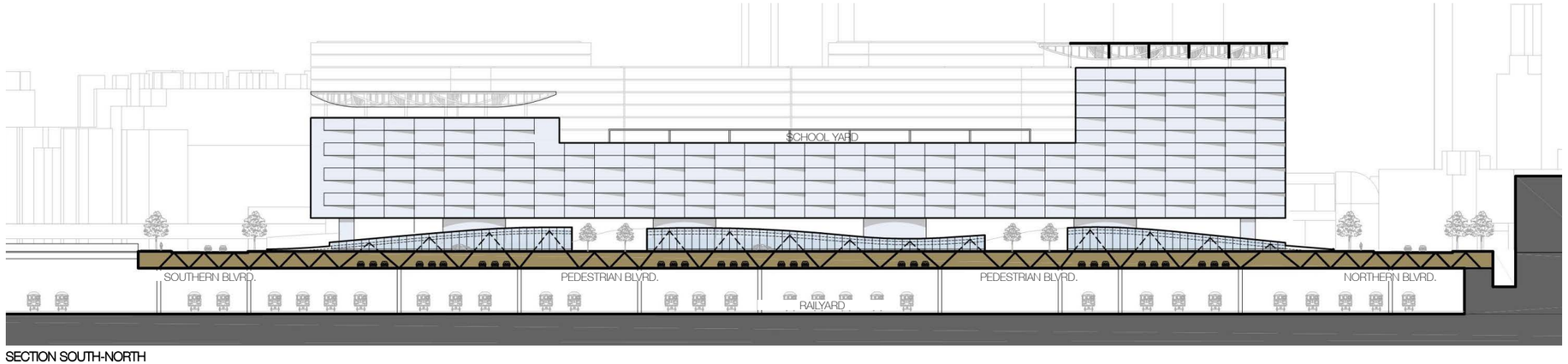
SOUTHERN BOULEVARD

LANDSCAPE RIBBON NO. 1 – SPORTS AND RECREATION
- SCHOOL ATHLETIC VENUES
- SPORTS BOSQUE.
- FAMILY GATHERING AND PICNIC AREAS

LANDSCAPE RIBBON NO. 2 – ECO/LAB
- DUCK POND/MEANDERING BOARD WALK
- RAIN GARDENS AND STORM WATER MAINTENANCE
- POCKET PARKS

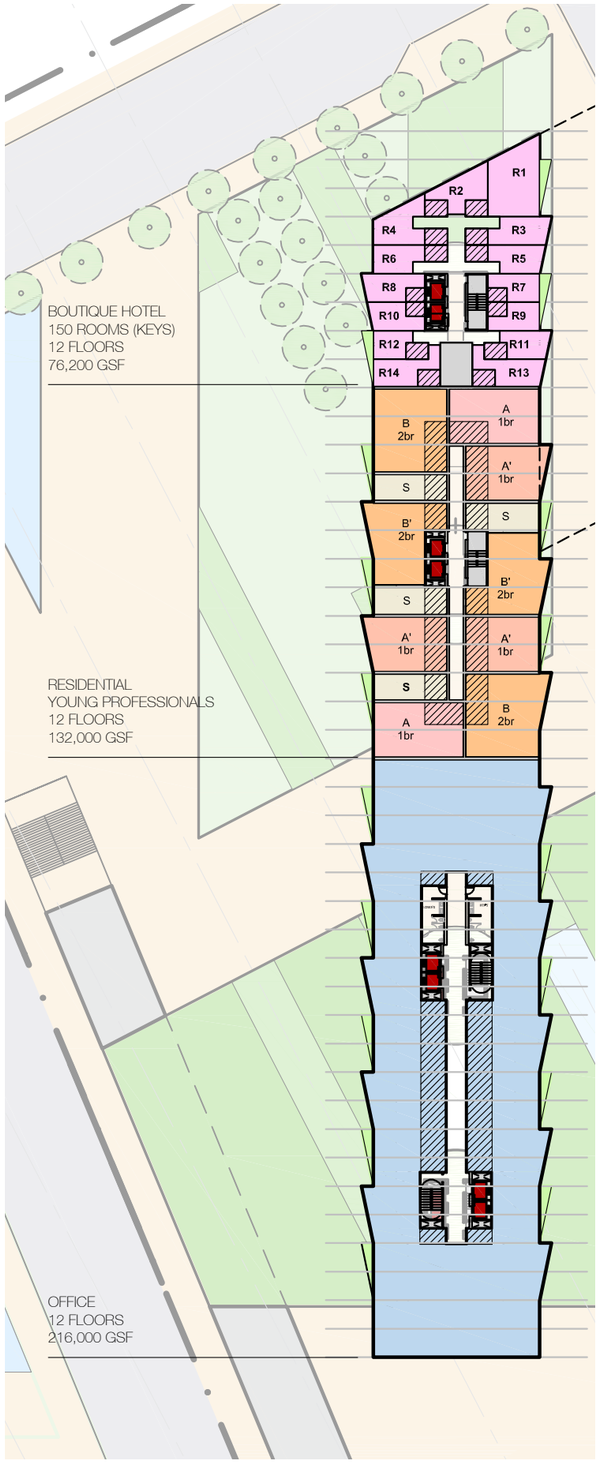
LANDSCAPE RIBBON NO. 3 – ART/SCULPTURE
- GREAT LAWN
- SCULPTURE COURT. MULTI-PURPOSE ARTS ED. AND GATHERING VENUE
- ART INSTALLATIONS

LANDSCAPE RIBBON NO. 4 – AGRICULTURE
- URBAN FARM
- SCHOOL PROGRAMS
- ALLOTMENT PLOTS



SECTION SOUTH-NORTH

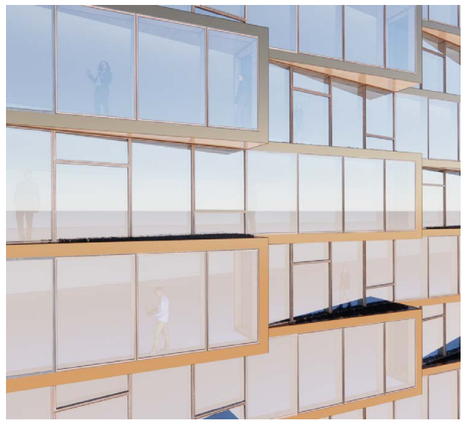
Typologies

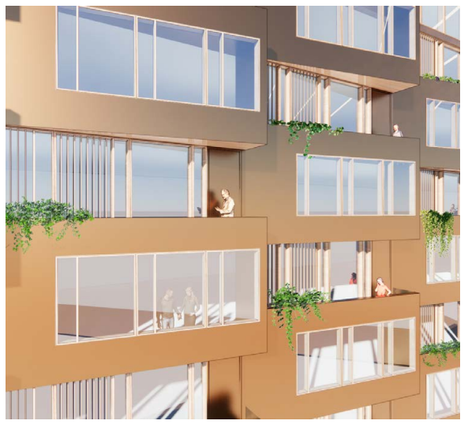


ENLARGED PLAN BUILDING 01

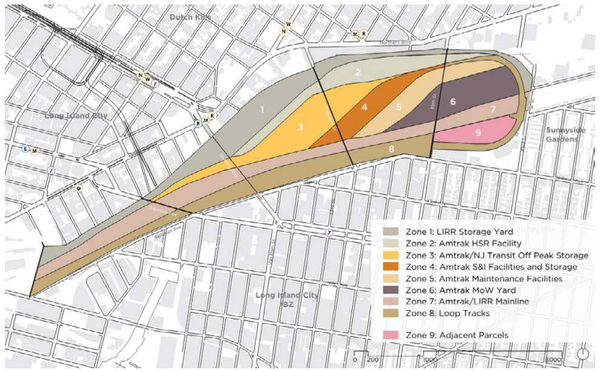
A uniform 70-foot-wide building module structured with floor slabs on an 11-foot vertical module defines an envelope with the spatial flexibility and structural framework necessary to serve a wide range of program options —in this case office, residence, and hospitality—with equal efficiency and affordability. Such a building block and design strategy can accommodate a variety of outcomes over time and nurture the growth of diverse, multigenerational communities.

Specifying a facade material such as copper ensures durability; copper can be recycled repeatedly without any loss of performance (recycling requires 80 to 90 percent less energy than primary production each year). Cross-laminated timber sequesters CO2 and similarly reduces emissions and energy consumption. On-site recycling and composting stations, available to all residents, will neutralize environmental impact throughout the life of the complex. Rainwater harvesting systems, designed as an integral component of a unified superstructure, will meet graywater needs of a live-work-play environment and socially inclusive and ecologically diverse urban green space.





Sequence of Construction



A landscaped topography, which holds the social infrastructure, commercial and industrial programs, telegraphs the yard trackage below. The residential volumes float above, bridging the column landing areas available in between rails.

As an assembly, this double pronged combination of layers and landscaped ribbons enables a strategy of construction by phases, starting on the Northern Boulevard edge and continuing southward.

This correspondence between trackage sectors and masterplan phasing creates a frictionless synergy - facilitating the logistics and operations of construction, while the varied programmatic components within each of the phases guaranty the urban viability of the intervention from its first stage. Only limited areas undergo construction operations at any given time, with all trackage remaining in place and operative through the process.