The Sustainable Development Goals
Building Energy NYC 2018

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Senior Building Systems Consultant, CPHD
We make buildings perform better

By providing a whole-building approach to design and construction

Over 125 employees in 3 locations:
New York, NY | Washington, DC | Norwalk, CT

SWINTER.COM
New York City
ONE NYC

Four Principles

**Growth**
Population growth, real estate development, job creation, and the strength of industry sectors

**Sustainability**
Improving the lives of our residents and future generations by cutting greenhouse gas emissions, reducing waste, protecting air and water quality and conditions, cleaning brownfields, and enhancing public open spaces

**Equity**
Fairness and equal access to assets, services, resources, and opportunities so that all New Yorkers can reach their full potential

**Resiliency**
The capacity of the city to withstand disruptive events, whether physical, economic, or social
ONE NYC
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Steven Winter Associates, Inc.
NEW YORK, NY | WASHINGTON, DC | NORWALK, CT
ONE NYC
Sustainable Development Goals

• July 2018

Voluntary Local Review

NYC is First City in the World to Report to UN on Local Steps Toward Global Goals

In April 2015, NYC committed to becoming the most resilient, sustainable, and equitable city in the world through its groundbreaking OneNYC strategy. OneNYC is a model for sustainable development at the local level. The plan includes commitments, milestones, and metrics. NYC publishes an annual progress report on Earth Day, which is April 22nd.
ONE NYC
Sustainable Development Goals

• Buildings’ role
  • Carbon emissions reductions
  • Resiliency
  • Equitable, affordable housing
  • Healthy environment
  • Beacon in community

Voluntary Local Review
New York City’s Implementation of the 2030 Agenda for Sustainable Development
July 2018

Global Vision
Urban Action

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425 Grand Concourse
425 Grand Concourse
Project Overview

- Mixed-use
- Bronx, NY
- Construction start – 2019
- Project Team
  - Trinity Mid Bronx Development
  - Dattner Architects
  - Dagher Engineering
  - Steven Winter Associates, Inc.
  - Monadnock Construction
425 Grand Concourse
Development Team Goals

• Develop certified Passive House
• Reduce utility cost to low-income tenants
• Reduce operating expenses for landlord
• Provide air quality benefits to tenants plagued by respiratory ailments
• Ensure high-quality exterior envelope
• Provide resiliency measure after Superstorm Sandy (in conjunction to gas-fired generator for emergency loads, domestic water and limited elevator service) to offer “Shelter-in-Place” option
## 425 Grand Concourse Affordable Housing

### Projected Monthly Rents -- Based on 2017 NYC Income Limits

<table>
<thead>
<tr>
<th>Unit Type</th>
<th>30% AMI</th>
<th>40% AMI</th>
<th>60% AMI</th>
<th>80% AMI</th>
<th>100% AMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Studio</td>
<td>$446</td>
<td>$613</td>
<td>$947</td>
<td>$1,281</td>
<td>$1,615</td>
</tr>
<tr>
<td>One Bedroom</td>
<td>$480</td>
<td>$659</td>
<td>$1,017</td>
<td>$1,375</td>
<td>$1,733</td>
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<tr>
<td>Two Bedroom</td>
<td>$586</td>
<td>$801</td>
<td>$1,230</td>
<td>$1,660</td>
<td>$2,089</td>
</tr>
<tr>
<td>Three Bedroom</td>
<td>$669</td>
<td>$917</td>
<td>$1,413</td>
<td>$1,910</td>
<td>$2,406</td>
</tr>
</tbody>
</table>

Annual income remaining after paying rent: $12,694

- **277 affordable units**
  - 45 studios
  - 92 1-BR
  - 94 2-BR
  - 46 3 BR
425 Grand Concourse
A Community Beacon
425 Grand Concourse
A Community Beacon
425 Grand Concourse
Mixed Use

- Residential
- Medical facility
- Educational facility
- Cultural facility
- Retail
- Parks comfort station
425 Grand Concourse
Ground Floor Plan
425 Grand Concourse
Residential Floor Plan
425 Grand Concourse
Energy Efficiency - Envelope

Envelope Efficiency Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roof</td>
<td>R-30</td>
</tr>
<tr>
<td>Above Grade Walls</td>
<td>R-20 effective</td>
</tr>
<tr>
<td>Below Grade Walls</td>
<td>R-10</td>
</tr>
<tr>
<td>Windows – Effective U-value</td>
<td>0.25 Btu/hr.ft².F</td>
</tr>
<tr>
<td>Glazing SHGC</td>
<td>0.27</td>
</tr>
<tr>
<td>Façade Air Tightness</td>
<td>0.08 cfm/sf-façade @ 50 Pascals</td>
</tr>
</tbody>
</table>
425 Grand Concourse
Energy Efficiency – Ventilation

- 85% efficient centralized energy recovery ventilators
- Constant **balanced** supply and exhaust ventilation
- Fresh air filtered with MERV13
- High & low zone split
  - Reduces fan energy from high static pressures
  - Aerosealed ducts to reduce duct leakage
425 Grand Concourse
Energy Efficiency – Heating & Cooling

• Variable refrigerant flow (VRF) system
• Condenser banks on 2nd floor roof and tower roof
• VRF heat recovery will allow for simultaneous heating and cooling in building

Source: Mitsubishi
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Energy Efficiency – Heating & Cooling

Typical Multi-family Building: 500-700 SF/TON Cooling Load
• In order to not oversize equipment
  • Utilized single “ductless” console unit to serve two rooms, where possible
  • Worked with manufacturer to allow condensing units to be overconnected
  • Worked with manufacturer to limit the capacity of the evaporator units, as needed
425 Grand Concourse
Energy Efficiency – Lights

• Lighting
  • Common areas are key
  • High efficacy LED fixtures
  • Limited fixture counts to reduce lighting energy
  • Bi-level shut-off controls in corridors
  • Occupancy controls
  • Meet IESNA minimum lighting levels
425 Grand Concourse
Energy Efficiency – Appliances, Plugs

- Appliances
  - All Energy Star appliances
    - Except for commercial dryers
  - No ice makers in refrigerators
- Dwelling unit plug loads are a big wild card in MF buildings
  - Energy monitoring w/ tenant dashboard proposed

Energy Star Refrigerators
IMPROVED INDOOR AIR QUALITY

Mechanical ventilation system
Efficient MERV 13 filters

No VOC paint and sealants

Services provided
- Designing the mechanical ventilation system with efficient MERV 13 filters, reduces the amount of bacteria and particle matter in the supply air.

Impacting
740
people

ENERGY EFFICIENCY

Optimized building envelope

Efficient lighting and high efficacy fixtures and bi-level controls

Passive house standards
= 50-70% reduction in energy use*

Services provided
- Designing 425 Grand Concourse to the Passive House standard reduces the energy use by 50-70%. This energy efficient design both includes the building envelope and the mechanical systems.

* Steven Winter Associates, Inc. 2018

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425 Grand Concourse Sustainable Development Goals
### ACCESS TO BASIC SERVICES

#### 277
Affordable residential units

- Expected income level of future residents is 30-100 %*

**Services provided**
- Keeping a focus on costs in the design – taking reasonable economic choices while not compromising the quality of the construction, makes it possible to provide affordable housing to a range of family sizes with annual income ranging from 30-100 % of area median income.

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### CLIMATE ACTION

#### 50-70% CO₂ reduction*

- Generator on 1st floor roof providing back-up power in the building
- Boiler plant located on bulkhead – ensuring hot water in case of a flooding

**Services provided**
- Planning for the future weather in the building design results in a resilient building that is able to adapt to the impacts of more “extreme” weather.

*compared to a similar, code-built building