The Sustainable Development Goals
Building Energy NYC 2018

Dylan Martello
Senior Building Systems Consultant, C PHD
We make buildings perform better

By providing a whole-building approach to design and construction

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ONE NYC
Four Principles

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

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

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

Resiliency
The capacity of the city to withstand disruptive events, whether physical, economic, or social
ONE NYC

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1. No Poverty
2. Zero Hunger
3. Good Health and Well-being
4. Quality Education
5. Clean Water and Sanitation
6. Affordable and Clean Energy
7. Life on Land
8. Decent Work and Economic Growth
9. Industry, Innovation and Infrastructure
10. Reduced Inequalities
11. Sustainable Cities and Communities
12. Responsible Consumption and Production
13. Climate Action
14. Life Below Water
15. Peace, Justice and Strong Institutions
16. No Poverty
17. Partnerships for the Goals
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
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
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
## 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>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></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>
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<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>

- 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
Envelop Efficiency Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Requirement Details</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
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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
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

*EPA US household standard

ES w/ ice makers
ES w/o ice makers

Annual Energy Consumption (kWh/yr)

Capacity (cu. ft.)
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Sustainable Development Goals

**IMPROVED INDOOR AIR QUALITY**

**Mechanical ventilation system**
Efficient MERV 13 filters

No VOC paint and sealants

Impacting
740 people

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

**ENERGY EFFICIENCY**

Efficient lighting and high efficacy fixtures and bi-level controls

Optimized building envelope

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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Sustainable Development Goals

11.1 ACCESS TO BASIC SERVICES
Green roof terrace

277 Affordable residential units
Expected income level of future residents is 30-100 %*
Increasing quality of life

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.

13 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

Steven Winter Associates, Inc.
NEW YORK, NY | WASHINGTON, DC | NORWALK, CT

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