The Seventy-Six - 76 Second Avenue, Albany, New York, U.S.

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The equitable and sustainable Seventy-Six development in Albany is the first ever triple net-zero (energy, water, waste) development in the U.S. It features 3 main residential buildings—A and C with 7 floors and 40,320 sq ft each, and B with 9 floors and 136,080 sq ft. Lower levels are used in-part for retail and education, and on site amenities include a pool, garden, urban farm, green house, wetland, and rooftop restaurant. Approximately 60-70% of the units will be high-quality affordable housing, with access to bike storage, busses, and ridesharing. Currently under development by South End Development (SED) and Garrison Architects, the project will improve sustainability, job opportunities, and housing equity, and has been awarded the NYSERDA Buildings of Excellence Award. It will achieve triple net-zero by using innovative engineering design tactics to create its full energy demand using renewables, conserve all water used (no outflow), and process all created waste (no outflow).

To start, each building was designed to be as environmentally efficient and affordable as possible. SED employed a factory-built, 12 foot, modular design of braced steel-framed units for each building, in which small units slot against and on top of each other. Units may then be joined to create larger apartments—allowing for flexibility. Each unit's MEP systems are integrated. The repetitive nature of this design saves cost, time, and material use, thereby lowering carbon footprint. Having less to build on-site reduces noise pollution, and factories allow for testing and fine tuning when working with modular units. For example, air tightness is tested and optimized there. Each unit includes R-50 roofing, R-11 triple-pane IGU glazing, R-5 thermally broken aluminum frames, R-38 walls, 2 inches of exterior insulation wrap, and a 29% solar heat gain coefficient. Combined with durable and natural materials, abundant natural light, built-in solar-driven ventilation, balconies with built-in planters, passive house design through solar shading and overhangs, and vented rainscreen cladding, makes these units hyper-efficient. Units are joined with an airtight seal, and placed on a foundation and slab both wrapped in 4 inches of insulation. Connecting to each balcony are artistic, biophilic shades which are adjustable by each resident, allowing them to use passive home technology for thermal and light comfort levels, and the building’s design. Lastly, greenery and trees block the summer sun while allowing solar heat gain in the winter. All these design features combined lead to minimal heating and cooling loads.

Net-zero energy is achieved by combining rooftop solar energy installations, urban wind turbines, batteries, solar thermal technology, borehole thermal energy storage, hydroelectric technology, biowaste, and geothermal heat pumps. These power the HVAC, appliances, lighting, electric cars, water systems, and outlets—the building is always ready for its residents' demand. Excess energy and heat is often produced—the solar arrays alone already produce 2,750 MWh—so excess electricity is stored in the batteries and excess heat is stored in the boreholes. Once the batteries are full, the remainder gets sold to the grid. Batteries are tapped into when the renewables don’t produce enough to meet demand. The buildings use an efficient flexible refrigerant flow system for HVAC, heat most water through solar thermal rooftop units, and use low-energy LED lighting.

For net-zero waste, all trash is either recycled, composted, or burnt on site for energy. Nothing goes to the landfill.

The Seventy-Six collects 12% of the water it uses from rainwater and takes 88% from municipal supplies. But, achieves net-zero water by ensuring that no outflow is generated (zero sewage contribution). Water is reused, repurposed, or processed. The roof collects rainwater and filters it through on-site water treatment facilities, which includes passing through the aquaponics urban farm where fish and plants purify and filter the water. Greywater used by residents goes through a similar process, passing through biofilters and traditional filtration systems. Filtered water is then reused in showers, for irrigation, etc. Wastewater is typically cleaned for biomass energy production, irrigation, recycling processes, and compost.

Incorporating urban farming grants residents free healthy food, without needing to use municipal water, or get in a car and drive to a farmer’s market (which releases more emissions). Furthermore, storage ponds, and irrigated wetland and greenery areas provide refuge for urban pollinators and animals, incorporating ecology into the development’s design.

The Seventy-Six not only sets a new bar for sustainable residences worldwide, it does so in a way that provides highly-needed affordable housing, and engages the public with their natural, urban, surroundings.

Information Sources -

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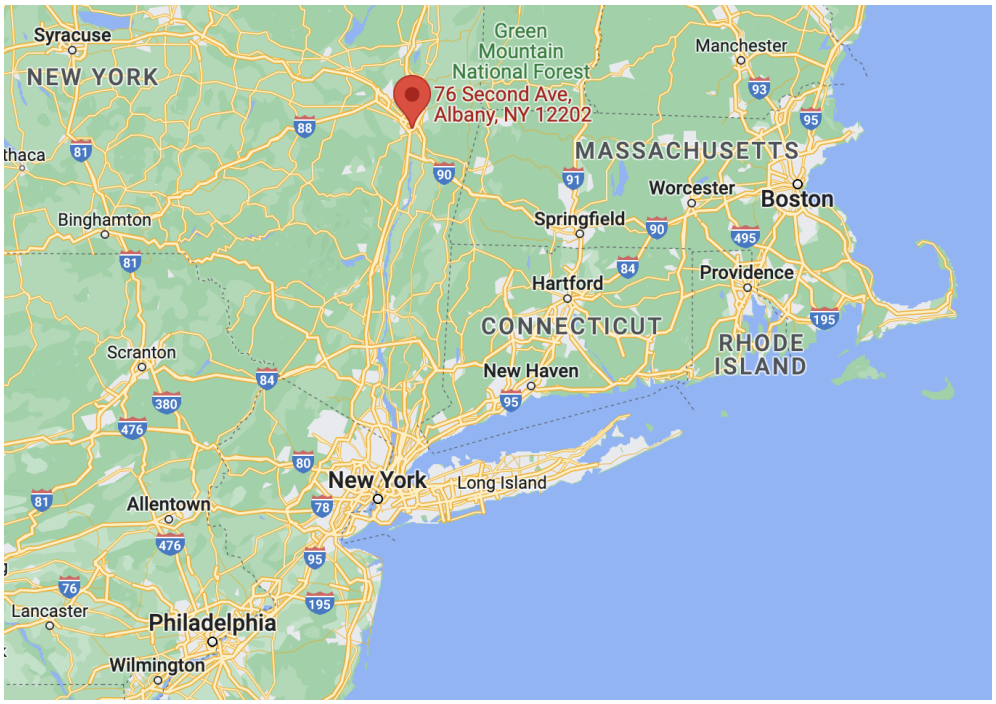
Photo Source - https://www.bizjournals.com/albany/news/2022/05/11/the-seventy-six-albany-development-on-track.html



Map Source -

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