

# Sunrise Chestnut Hill

## Enterprise Green Communities (EGC)

### Green Building Energy Narrative

May 5, 2022

Sunrise Senior Living (Sunrise) and their design team are designing Sunrise Chestnut Hill, the project, to meet the standards of the Enterprise Green Communities (EGC) Green Building Rating program.

## Operating Energy

Sunrise's commitment to environmental stewardship is demonstrated by efficient energy management in their communities. They are committed to the environment by making energy-conscious decisions and executing cost effective improvements to their buildings and community operations. Sunrise takes pride in their leadership not only in the future of senior care but also in the fact that they are leading the field in energy efficiency.

Since the EPA created "Senior Living Community" as a property type for Energy Star Certification, Sunrise has more than forty (40) Sunrise communities in the senior living community's category certified every year in this EPA ENERGY STAR award program. This certification solidifies their commitment to maintaining highly efficient communities. Over two hundred (200) Sunrise communities are enrolled in the Energy Star program. The water, gas, and electric bills for all Sunrise senior living communities in the United States are submitted monthly and rated against other Energy Star participants. Sunrise was the first senior living operator to enroll and achieve this certification, and they continue to have the most certifications. The ENERGY STAR certification signifies that these buildings perform in the top 25 percent of similar buildings nationwide for energy efficiency and meet strict performance levels set by the EPA. These communities use an average of thirty-five percent (35%) less energy and release thirty-five percent (35%) less carbon dioxide than typical communities.

It is not just the initial building program that is considered when a community, such as Chestnut Hill, is constructed. This is a living program. Sunrise conducts a "battle of the buildings" internal competition nationwide where each building is evaluated year over year to determine which one saves the most energy over the previous year. This creates awareness and engages all community team members to try to reduce energy consumption. Additionally, behavioral training for community team member staff reinforces Sunrise's commitment to their energy saving policy. Staff receive guidelines for day-to-day lowering of energy consumption in numerous ways. Staff is educated and awareness of specific operational behaviors is promoted focusing specifically on implementing best practices for efficiency.

All Sunrise communities have a comprehensive maintenance program in place to maintain equipment and conserve energy costs focusing on best practices for efficiency in the areas of kitchen and laundry operations, lighting and Heating Ventilation Air Conditioning and Refrigeration (HVAC&R) maintenance and management.

## Mechanical System

To help put the HVAC system selection process in context, the following characteristics of the building, as currently designed, have an influence on the system selection:

- There are ninety-five (95) Assisted Living (AL) and Memory Care (MC) units located in this 5-story building.
- The building will be constructed of a concrete structure and will be designed with a low-slope roof.
- Energy efficiency is a significant controlling factor in Heating Ventilation Air Conditioning (HVAC) system selection and design.
- The building will be configured for utility metering by providing a single meter for each of the following: Electric; Water/Sewer; and (optional) Natural Gas.
- Resident areas will be mechanically ventilated and continuously exhausted 24/7 using Energy Recovery Units (ERU) which incorporates the use of a heat recovery enthalpy wheel.
- Occupants' temperature comfort, indoor air quality, and acoustic disturbance within each resident unit are of primary importance when designing the mechanical systems.

Given the criteria above, Sunrise has identified two possible HVAC systems for the resident units in the Chestnut Hill building.

1. Variable Refrigerant Volume (VRV) often synonymous with Variable Refrigerant Flow (VRF) for resident units and smaller public spaces. Ducted return with MERV-8 return filter grill will be specified to improve Indoor Air Quality (IAQ). The system will have roof mounted condensing heat pumps known as Heat Recovery Units (HRU) capable of providing simultaneous heating and cooling year around in every resident unit. Each fan coil will be controlled via programmable thermostat connected to simple VRF control panel. The set points will be set for night set back temperatures to save energy.
2. Water Source Heat Pump (WSHP) often synonymous with Hydronic 2-pipe system for resident units and smaller public spaces. Stacked type heat pump with built-in MERV-8 return filter grill will be specified to improve Indoor Air Quality (IAQ). The system will have roof mounted cooling tower and electric or gas fired boiler. Set of VFD driven pumps will distribute condenser water thru the building. Set of small inline pumps will inject the heat from the boilers in wintertime. This system is capable to provide simultaneous heating and cooling in every resident unit year around. Each heat pump will be controlled via programmable thermostat. The set points will be set for night set back temperatures to save energy.

For both systems high efficiency gas-fired (or electric heat pump) 100% outside air Energy Recovery Units (ERUs) will be used to provide conditioned, code required ventilation air in every resident room and

continuous exhaust from all bathrooms and toilet rooms. These units will be able to operate in the ventilation and heating mode during loss of power via an emergency generator. ERUs will be equipped with MERV-13 pre-filter, UV light and final MERV-8 filter. Also, the units' operation modes (heating, cooling, dehumidification, economizer) will be controlled with programmable thermostat and humidistat.

For large public spaces for both systems, high efficiency Roof Top Units (RTUs), gas fired energy recovery units (or electric heat pumps, or water-cooled heat pumps) will be specified. These units will be equipped with MERV-8 filters, UV light, demand ventilation control with CO2 sensor in the high occupancy spaces to reduce energy use. The set points will be set for night set back temperatures to save energy and carbon pollution. All ERUs and RTUs will be connected and monitored, set points and status, thru simple control panel accessible by building operation employee.

#### Insulation Requirements

- All ductwork, piping, plenums, and equipment will be insulated with IECC required or higher R-value insulation using low VOC adhesives and sealants.

#### Testing, Adjusting, Balancing, (TAB), Commissioning

- Testing, Adjusting, Balancing, (TAB), will be performed for all air and water systems/equipment in accordance with Associated Air Balance Council (AABC) or National Environmental Balancing Bureau (NEBB) requirements.
- The Testing, Adjusting and Balancing (TAB) agency will be certified by AABC or NEBB.
- Report of final measurements and equipment operational performance data will be reviewed by design of record and owner.
- Project Commissioning is anticipated.

### Electrical System

#### Electrical Service and Distribution

Power service to the building will be from a pad-mounted utility company transformer. The service will be 208/120 volt, three-phase, four-wire. The main switchboard will have three sections. There will be an incoming section, a main section, and a distribution section. The switchgear will be in a dedicated electrical room in the garage. The larger custom, centralized HVAC equipment will be fed from main switchgear or dedicated distribution panelboards.

#### Charging Stations

Per Newton's Zoning Ordinance, a minimum of 10% of the parking spaces will have access to electric vehicle charging stations, and an additional 10% of parking spaces will be electric vehicle charging station ready, meaning that electrical systems and conduit are existing for expanding the number of charging stations as needed.

#### Renewable Energy

If possible and there is sufficient area on the roof, there will be infrastructure present for the potential installation of photovoltaic solar panels.

## Emergency Power

Sunrise's primary goal is to keep residents and staff safe and comfortable in the building during a power outage. The building will have an emergency generator designed within a weatherproof enclosure. The emergency generation system will have two Automatic Transfer Switches (ATS). One ATS will be dedicated to life safety (NEC 700) as required by the National Electrical Code (NEC). These loads will include exit and egress lighting, the fire alarm system, and any emergency communications systems. The other ATS (NEC 702) will serve optional standby electrical loads including non-egress area lighting, communications, and security systems, one elevator, HVAC heating and ventilation for select areas, kitchen coolers/freezers, computer systems and other loads as deemed necessary.

If a fire pump is determined to be necessary, it will have its own ATS, which will be connected directly to the utility and to the emergency generator output circuit breaker. The size of the generator will be determined based upon the need for a fire pump and the number of building systems to be served.

## Lighting

Lighting in the building will primarily be specified as high efficiency LED fixtures. The residential units will have a ceiling mounted fixture in the wet-bar area and a vanity light over the mirror in the toilet area. A night light will be provided in each resident bedroom and bathroom. These night lights will also be LED.

Corridors shall be a minimum of 15 foot-candles of illumination levels during the day and 7.5 foot-candles at night. Resident rooms shall have minimum illumination levels of 7.5 foot-candles as general lighting, and a minimum of 30 foot-candles at the designated reading areas (bed/chair area) and/or in the toilet/bathroom area.

Occupancy sensors will be provided in offices, meeting rooms and other areas for energy efficiency. Exit lights will be LED type, located in all paths of egress. Emergency/night lighting will be provided by un-switched branch circuits.

Exterior lighting shall have egress illumination levels as required by National Fire Protection Association (NFPA) 101. Only the portion of the exterior discharge that is immediately adjacent to the building exit discharge door will incorporate required emergency illumination and not the entire exterior discharge path to the public way. All fixtures will be sharp cut-off type and select fixtures will utilize house side shields to minimize the light trespass.

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