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Arcadis



249 Sunview Street Multi- Unit Residential Building

Energy Study for OPA/ZBA Submission

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1 SCOPE

This report is to assist in clarifying the energy strategy for the proposed building at 249 Sunview, Waterloo, ON, as requested by City of Waterloo Staff in the pre-submission consultation report. The following points are to directly address the staff comments in the “sustainable design” section of the report (page 12) of 249 Sunview.

2 PROJECT OVERVIEW

The project is a residential apartment building with 12 floors above grade. The building use is residential, Part 3 building, Group C occupancy with 131 residential suites.

3 REPORT CONTENT

The following is a list of items meant to clarify the energy strategy as outlined by City of Waterloo Staff:

3.1 Energy Performance Comparison Summary

The proposed building design characteristics to be considered provide for superior energy performance as compared to the ASHRAE 90.1/SB-10 baseline building:

3.1.1 Mechanical Systems

Component	Proposed Building	Baseline Building (ASHRAE 90.1/SB-10)
HVAC	High efficiency heat pump in each suite with EER 15. High efficiency condensing boilers at 98% E_t HRV or ERV within suites or central system to exhaust washrooms and provide fresh air.	Heat pump in each suite with EER 12. Boilers at 90% E_t . Individual washroom exhaust fans.
Domestic Hot Water Fixtures	Higher efficiency low flow plumbing fixtures. Showers: 5.7 LPM Lav. faucets: 3.6 LPM Kitchen sink: 5.7 LPM	Plumbing fixtures with flow rates according to current code: Showers: 7.6 LPM Lav. faucets: 8.3 LPM Kitchen sink.: 8.3 LPM

3.1.2 Lighting and Electrical

Component	Proposed Building	Baseline Building (ASHRAE 90.1/SB-10)
Lighting	LED lighting at an average of 0.35 W/ft ² .	Lighting at an average of 0.46 W/ft ² .
Appliances	Energy Star appliances.	Standard appliances.

3.1.3 Architectural Building Envelope Systems

Component	Proposed Building	Baseline Building (ASHRAE 90.1/SB-10)
Exterior Walls	R-30	R-20
Roof	R-40	R-35
Fenestration	U-Value: 0.29 SHGC: 0.39	U-Value: 0.38 SHGC: 0.40

Values in section 3.1.3 were provided by Arcadis Architects (Canada) Inc..

3.1.4 Result Summary

Along with building envelope energy efficiency improvements specified by the architects, based upon similar past energy modeling scenarios, it is estimated the proposed building will consume ~25% less energy, compared to the baseline building.

3.2 Solar Readiness

3.2.1 The roof at 249 Sunview does not have an enormous opportunity to add solar panels to it, but there is limited capacity to add a limited amount.

3.2.2 Based on the roof size and current solar density, it is estimated that there is a potential to add 100kW – 150kW of solar capacity to the building.

3.2.3 The solar capacity can be used to offset the amount of power required from the electrical utility, but it is not likely enough to supply all the buildings power demands.

3.3 Natural Gas Alternatives

3.3.1 Alternatives to water source heat pumps, which use natural gas boilers to maintain hydronic loop temperatures, to be considered are geothermal and air source heat pump systems. Variable refrigerant flow (VRF) systems will be considered as well as a low carbon alternative to natural gas space heating. VRF systems and geothermal and air source heat pump systems are fully electric and do not use natural gas.

3.4 Electric Vehicle (EV) Charging

- 3.4.1 As required by current city of Waterloo by-law standards, underground parking stalls that are covered in a multi-unit residential building shall have 100% of stall provided with rough-in for future EV chargers.
- 3.4.2 This building will comply with this standard, providing conduit back to the main electrical room to have the infrastructure in place for the EV chargers as required.
- 3.4.3 Above this requirement, the building can be provided with EV chargers ready to go at time of completion, with the current number of EV chargers to be determined during the design phase of the building.
- 3.4.4 The new electrical service can be upsized to allow for future EV charging.

3.5 Backup Power Systems

- 3.5.1 The building at 249 Sunview will be taller than 18m and therefore considered a 'high building' according to the Ontario Building Code section 3.2.6.1. As a high building, it is required to have a life-safety generator to supply power to some essential services, including a firefighters elevator (OBC 3.2.7.9), sprinkler fire pump (NFPA 20) and fans for smoke control (OBC 3.2.7.9).
- 3.5.2 This will be run on natural gas and located on the roof top.
- 3.5.3 Certain essential services shall be connected to the generator, including a fire pump (if needed), firefighters' elevator, smoke control systems, emergency lighting, and exit signage.
- 3.5.4 There is also an opportunity to provide power to non-life-safety electrical loads, which can include: water pumps, sanitary and storm pumps, security, communications, heating, etc., as well as other owner-requested loads.