

Proposed Model Inputs

4050 Yonge Street

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Prepared for:

Easton's Group / Gupta Group
Attn/: Mario Angelucci
3100 Steeles Ave East, Suite 601
Markham, ON L3R 8T3

fluentgroup
c o n s u l t i n g e n g i n e e r s

295A Broadway Ave, Main Floor
PO Box 188 STN A
Orangeville ON L9W 2Z6
Tel: 888.358.3683

1 Introduction

The Proposed Model Inputs Report is intended to highlight the key design features of the 4050 Yonge Street that have been incorporated into the energy model for the purpose of demonstrating compliance with the Ontario Building Code and the Toronto Green Standard. The design features were obtained from the most up-to-date drawings.

2 Project Description

The proposed 4050 Yonge Street development consists of two towers (35 and 21 floors) with a shared podium. The towers include residential suites, hotel suites. The buildings also contain hotel and condo amenity areas, a restaurant, and five levels of underground parking.

3 General Project Characteristics

Design Parameter	Performance	Note/[Source]
Site/Building Data		
Modeled Floor Area	772,899 ft ² ; 71,841 m ²	Excluding parking garage [PS-C Report]
Weather File	Toronto CWEC	None
Utility Rates		
Electricity	Commercial: ~0.13 \$/kWh; ~11.40 \$/kW Residential: Time of use rates	[Toronto Hydro Rates; Nov. 2019]
Natural Gas	~ 0.25 \$/m ³	[Enbridge Gas Rates; Nov. 2019]
Schedules		
Occupancy	Default NECB schedules according to space type	None
Heating Set-Points	72F; unoccupied setback of 64F	None
Cooling Set-Points	75F	None

4 Building Envelope Characteristics

Design Parameter	Performance	Note/[Source]
Opaque Sections		
Roofs R-Value [ft ² ·F·h /Btu]	≥ R-35 effective	None
Above-Grade Walls R-Value [ft ² ·F·h /Btu]	≥ R-20 effective	None
Balcony Section R-Value [ft ² ·F·h /Btu]	~R-3 effective	Modeled using THERM
Fenestration Sections		
Window-to-Wall Ratio	~50%	None
Window Performance Characteristics	Glazing Performance: <ul style="list-style-type: none"> ▪ Assembly U ≤ 0.33 Btu/ft²·°F·h ▪ SHGC ≤ 0.35 	None

5 Internal and External Load Characteristics

Design Parameter	Performance	Note/[Source]
Lighting		
Suite Lighting	<u>Design to the following LPD:</u> <ul style="list-style-type: none"> ▪ Areas where lighting provided = 0.30 W/ft² ▪ Areas with capped connections modeled at 0.46 W/ft² 	[TGS Guidelines]
Hotel Room Lighting	<u>Design to the following LPD:</u> <ul style="list-style-type: none"> ▪ Dormitory – Living Quarters = 0.30 W/ft² ▪ Install occupancy sensors in hotel rooms 	[ASHRAE 90.1-2013]
Base Building Lighting	Reduce base building average interior LPDs to 20% (or more) below ASHRAE 90.1-2013 + SB-10 LPDs. <u>Design to the following LPDs:</u> <ul style="list-style-type: none"> ▪ Meeting Room = 0.86 W/ft² ▪ Ball Room = 0.86 W/ft² ▪ Pre-function = 0.86 W/ft² ▪ Bar/Lounge = 0.74 W/ft² ▪ Dining = 0.57 W/ft² ▪ Office = 0.80 W/ft² ▪ Corridor = 0.48 W/ft² ▪ Lobby = 0.85 W/ft² ▪ Parking Garage = 0.11 W/ft² 	Install lighting controls in all common areas (including amenity spaces, corridors, storage, parking, M/E rooms, etc. per ASHRAE 90.1-2013) [ASHRAE 90.1-2013]

Exterior Lighting	<ul style="list-style-type: none"> ~7.5 kW; 12 hr/day schedule 	[TGS Guidelines/NECB 2015]
Process Loads		
Ventilation	<ul style="list-style-type: none"> Ventilation/exhaust rates as per ASHRAE 62.1-2013 	[ASHRAE 62.1-2013]
Occupancy	<ul style="list-style-type: none"> Hotel Rooms and Suites: 25 m²/occupant Other spaces: as per ASHRAE 62.1-2013 occupancy densities and/or design information 	[TGS Guidelines/ASHRAE 62.1-2013]
Elevators	<ul style="list-style-type: none"> ~9.2 kW project wide 	Elevator load calculator based on regen motors [TGS Guidelines]
Kitchen Exhaust Fans	<ul style="list-style-type: none"> Multi-speed; average flow of 100 cfm; total input fan power ≤ 0.25 W/cfm; 2hr/day 	[TGS Guidelines]
Swimming Pool Heating	<ul style="list-style-type: none"> Evaporative load: 8.6 kW Heating load: 13.5 kW 	Swimming pool load calculations [TGS Guidelines]

6 Air-Side System Characteristics

6.1 Residential and Hotel Suites

System Description: In-Suite ERVs providing ventilation to fan coil units.

Fan Coil Unit Performance

Design Parameter	Performance	Note/[Source]
Heating Source	Hot water	None
Cooling Source	Chilled water	None
Fan Power	Total input fan power ≤ 0.25 W/cfm Multi-speed ECM motors	Modeled at continuous low speed; high speed cycles for heating and cooling

ERV Performance

Design Parameter	Performance	Note/[Source]
Type	Enthalpy core	None
Effectiveness	Effectiveness $\geq 70\%$	None
Fan Power	Total input fan power ≤ 0.85 W/cfm	None

6.2 Day Care, Amenity Areas

System Description: ERVs providing ventilation to fan coil units.

Fan Coil Unit Performance

Design Parameter	Performance	Note/[Source]
Heating Source	Hot water	None
Cooling Source	Chilled water	None
Fan Power	Total input fan power ≤ 0.25 W/cfm Multi-speed ECM motors	None

ERV Performance

Design Parameter	Performance	Note/[Source]
Type	Enthalpy core	None
Effectiveness	Effectiveness $\geq 70\%$	None
Fan Power	Total input fan power ≤ 0.85 W/cfm	None

6.3 Corridors

System Description: Central MUA providing ventilation to corridors.

Make-up Air Unit Performance

Design Parameter	Performance	Note/[Source]
Heating Source	Hydronic	None
Cooling Source	Hydronic	None
Fan power	Total input fan power ≤ 1.0 W/cfm	None

6.4 Parking Garage

Exhaust Fans

Design Parameter	Performance	Note/[Source]
Fan Speed Control	Constant Volume, CO control – ON/OFF	Assumed to run at full speed for 4 hours per day [TGS Guidelines]
Fan Power	Fan power ≤ 0.25 W/cfm; 0.77 cfm/ft ²	[OBC Part 6.2.2.3]

7 Plant-Level Characteristics

7.1 Heating Equipment

Design Parameter	Performance	Note/[Source]
Boilers	Condensing; $\eta \geq 95\%$	None
Temperature Control	Load reset	None

7.2 Cooling Equipment

Design Parameter	Performance	Note/[Source]
Chillers	Assumed COP ≥ 6.1 ; VSD	None
Temperature Control	Load reset	None
Cooling Tower	VFD; ≥ 75 gpm/HP	None

7.3 Pumping Equipment

Design Parameter	Performance	Note/[Source]
Hot Water Pumps	VFD; Premium Efficiency Motor	None
Chilled Water Pumps	VFD; Premium Efficiency Motor	None
Condenser Water Pumps	VFD; Premium Efficiency Motor	None

7.4 Service Water Heating Equipment

Design Parameter	Performance	Note/[Source]
Heater Efficiency	Condensing; $\eta \geq 95\%$	None
Pumps	CV; Premium Efficiency Motor	None
Fixture Flow Rates	Lavs = 1.9 L/min Kitchen = 1.9 L/min Showers = 5.7 L/min	Savings claimed for low flow fixtures [TGS Guidelines]