54 Jackson Road

ENERGY MODELLING INPUTS

METHODOLOGY

The following summary outlines the model inputs for the existing building at 54 Jackson Road, Dartmouth, NS as understood by RDH. Our understanding of the building is provided through the review drawings and narratives provided to RDH. Where these documents are not fully developed, assumptions have been made based on previous experience. This information will be used to assess the energy use of the current building and to target additional efficiency measures. Therefore we ask the architectural, mechanical and electrical designers to review the complete document and provide comments where the model assumptions deviate from the proposed operation.

GENERAL

Project Name	54 Jackson Road
Address	54 Jackson Road
Location	Dartmouth NS
Modelling Software	eQUEST 3.65
Weather File	
Energy Target	

Document References	Plans and Elevations	54 Jackson Rd plans&elevations.pdf
	Specification	54 Jackson Rd Specifications.docx
	Previous Retrofit Study	WHERE - NS owner's report JACKSON ROAD.pdf
	Baseline Property Condition Assesment	243343 VidaLivingInc FINAL BPCA 54 Jackson Rd Dartmouth NS Jun 24 2019.pdf
	Site Info	27803 Jackson Road RDH DR - Site Visit Questions_ZZAP2023-02-27 Site visit.pdf

ARCHITECTURAL

Space Types

Space Types Description	Area (ft²)	Area (ft²)	Units	NECB 2015 Space Type
Residential Area	8,920		ft²	Multi-Unit Residential Building
Corridor	1,983		ft²	Corridor
Unconditioned Basement	1,851		ft²	Storage garage - interior/Mechanical
Total conditioned	10,903		ft²	Varies
Total	12,754		ft²	

Global Parameters

Parameter Name	Existing	Retrofit Package #1	Value	Reference/Description

Opaque Assemblies

Assembly	Existing	Retrofit Package #1	Units	Reference/Description
Foundation Wall	R-1	R-20 Effective	(ft²-hr-˚F) / Btu	Uninsulated concrete wall - 54 Jackson Rd Specifications.doc
Exterior Wall W1	R-9.6	R-30 Effective	(ft²-hr-˚F) / Btu	2x4 walls with ~R10 fiberglass batt. Wood and brick cladding - 54 Jackson Rd Specifications.doc
Exterior Wall W2	R-13.7	R-30 Effective	(ft²-hr-˚F) / Btu	2x4 walls with ~R10 fiberglass batt. Vinyl siding. Based on site photos we assume 1" Amvic SilveRboard insulated sheathing (R5) behind vinyl siding.
Roof R1	R-13.8	R-40 Effective	(ft²-hr-˚F) / Btu	2x10 framing with R12 insulation - 54 Jackson Rd Specifications.doc

Window to Wall Ratio

Orientation	Existing	Retrofit Package #1
Overall	per elevs - 18%	No change

Fenestration Performance

Fenestration	Existing	Retrofit Package #1	Units	Reference/Description
New Double Pane vinyl windows	0.3	0.24	Utot (BTU/ft²-hr-˚F)	Values are assumed based on window type - 54 Jackson Rd Specifications.doc
	0.35	0.3	SHGCtot	
Old Double pane aluminum windows	0.5	0.24	Utot (BTU/ft²-hr-˚F)	Values are assumed based on window type - 54 Jackson Rd Specifications.doc
	0.5	0.3	SHGCtot	
Wood window at stairs	0.5	0.24	Utot (BTU/ft²-hr-˚F)	Values are assumed based on window type - 54 Jackson Rd Specifications.doc
	0.5	0.3	SHGCtot	

Airtightness	Existing	Retrofit Package #1	Units	Reference/Description
Infiltration Rate (@ Operating Pa)	4.31	2.16	ACH50	54 Jackson Rd Specifications.doc

MECHANICAL

HVAC Strategy

	Proposed			
General Description	Two stage boiler providing both DHW and hydronic heating. Dwelling units equipped with hydronic baseboard heaters.			

Heating Plant

Boilers	Existing	Retrofit Package #1	Units	Reference/Description
Plant	Natural gas burning 2-stage boiler	ASHPs		
Boiler Capacity	1675000	2x5 Ton	BTU/h	54 Jackson Rd Specifications.doc shows 495W = 1675000 btuh Retrofit - ThermAtlantic DX2W-2 https://thermatlantic.com/air-to-water-heat-pumps/residential-dx2w-modules/
Heating Efficiency	82%	3.47 @ 46F	COP	54 Jackson Rd Specifications.doc
Cooling Efficiency	82%	16	SEER	54 Jackson Rd Specifications.doc
Heating Water Supply Temperature	180	120	°F	Assumption
Heating Water Return Temperature	150	90	°F	Assumption
Heating controls				
Pumps	**Existing**	**Retrofit Package #1**	**Units**	**Reference/Description**
Pump type	Single Speed	Variable Speed	-	Assumed
Nameplate Power	-	-	HP	
Brake Horse Power	19	19	W/GPM	Assumed
Pump Efficiency	-		%	
Motor Efficiency	-		%	

Domestic Water Heating

System	Existing	Retrofit Package #1	Units	Reference/Description
DHW Heater	Indirect DHW served by heating boilers	Combined with Heat pump		
DHW Heater Capacity			MBH	
DHW Heater Age				
Thermal Efficiency	82%	COP = 2.7	%	54 Jackson Rd Specifications.doc
Building Peak Load	500 W/occ	500W/occ	GPM	Assumed per NECB 2015 Calibrated to summer hours 67%
DHW HW Supply Temp	60˚C (140˚F)		ºF (ºC)	Assumed
DHW Recirculating Pump	**Existing**	**Retrofit Package #1**	**Units**	**Reference/Description**
Pump	-	-		
Pump type	-	-	-	
Brake Horse Power	-	-	W/GPM	
Pump Efficiency	-	-	%	
Motor Efficiency	-	-		

Airside Systems

CORRIDOR

Zone Heating / Cooling	Existing	Retrofit Package #1	Units	Reference/Description
Corridor Heating/Cooling	Hydronic Heater in entry vestibule Baseboard heating in back stairs		n/a	

RESIDENTIAL SUITE SYSTEMS

Ventilation System

Element	Existing	Retrofit Package #1	Units	Reference/Description
System	Kitchen/Bathroom fans	Through Wall ERVs (Lunos e2) serving all areas.		
Design Air Flow	50		cfm/system	Assumed flow for bathroom and kitchen fans.
Outdoor air fraction	N/A	100	%	
Outdoor air volume control	N/A	Cosntant Volume		
Total Fan Power	0.5		W/cfm	Assumed power for bathroom and kitchen fans.
System Supply Fan Power	N/A	0.10	W/cfm	
System Return Fan Power	N/A	0.10	W/cfm	
Fan Control	Switch control	N/A		Assumed
Fan Schedule	3 hrs per day	24/7		Assumed bathroom and kitchen fans each run 3 hours per day
Heat recovery	N/A	80% Sensible	%	

Zone Conditioning Devices

Element	Existing	Retrofit Package #1	Units	Reference/Description
Suite heating	Hydronic baseboard perimeter heaters			
Suite cooling	None			
Fan Control	N/A			
Fan Power	N/A		W/cfm	
Operation (setpoint temp)	72 (22)		°F (°C)	Assumed
Cooling COP	N/A		COP	
Heating COP	N/A		COP	

ELECTRICAL

Lighting

Main space type	Existing	Retrofit Package #1	Controls	Reference/Description
Residential suites	5.00	5.00	W/m²	Assumed per NECB 2015. Please confirm light fixture type (LED/ hallogen/incandescent)
Corridor Lighting	7.10	7.10	W/m²	Assumed per NECB 2015. Please confirm light fixture type (LED/ hallogen/incandescent)
Unnocupied Basement/mech	4.60	4.60	W/m²	Assumed per NECB 2015. Please confirm light fixture type (LED/ hallogen/incandescent)

Process Loads

Load	Existing	Retrofit Package #1	Units	Reference/Description
Residential suite plug loads	5.00	5.00	W/m²	Assumed per NECB 2015 Calibrated to 1.3x NECB 2015
Laundry Room	20	20	W/m²	Assumed per NECB 2015
Unnocupied Basement/mech	1.0	1.0	W/m²	Assumed per NECB 2015

Space Conditions

Main space type	Thermostat Set points	Retrofit Package #1	Occupancy Density	Reference/Description
Residential suites	22 C	22 C Heating / 24 C Cooling	3 / suite	Assumed
Corridor	N/A	22 C Heating / 24 C Cooling	-	
Unnocupied Basement/mech	Unheated	Unheated	-	