

Appendix - A

Floor plans of the house

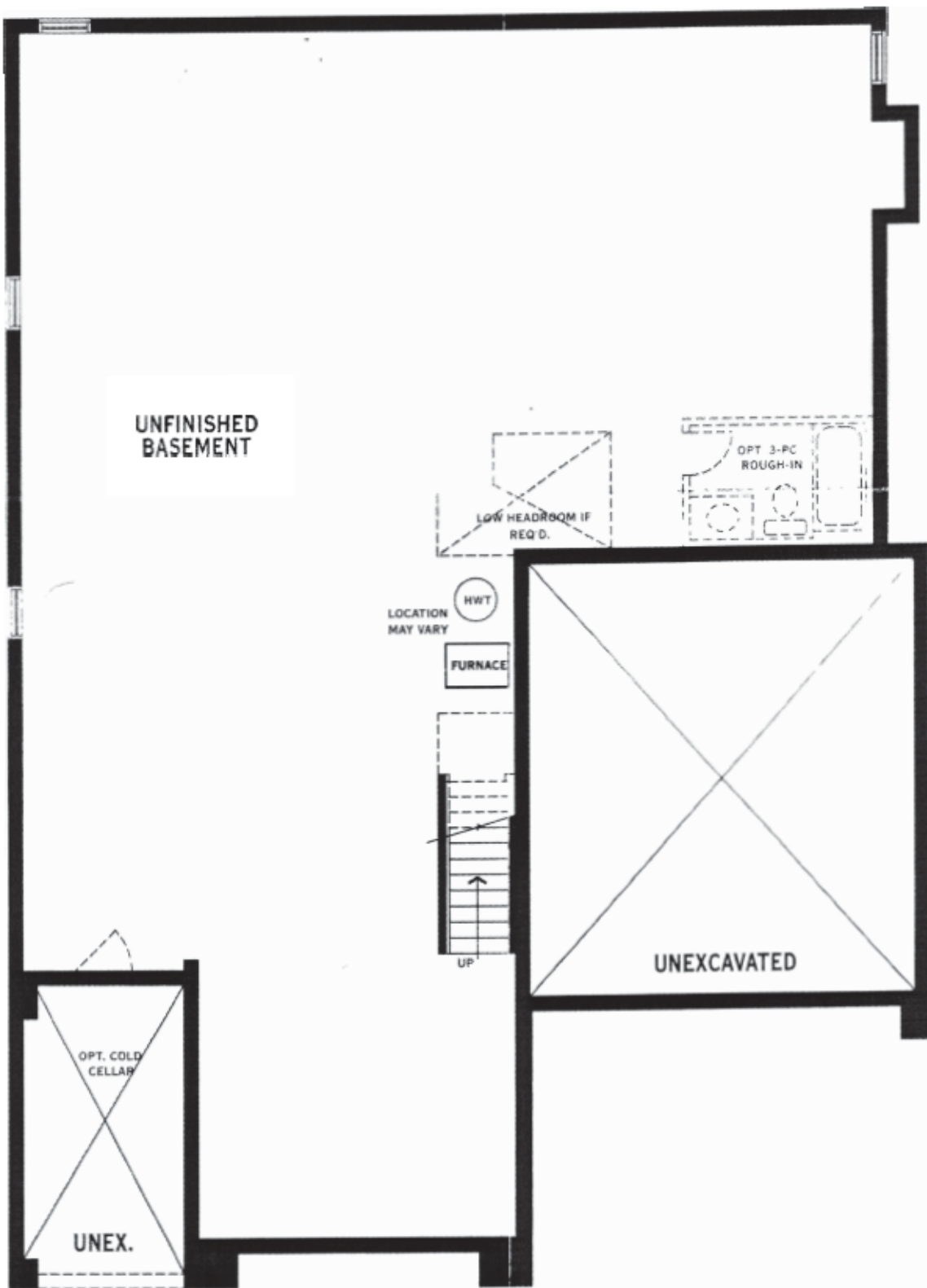


Figure A-1: Basement Floor plan

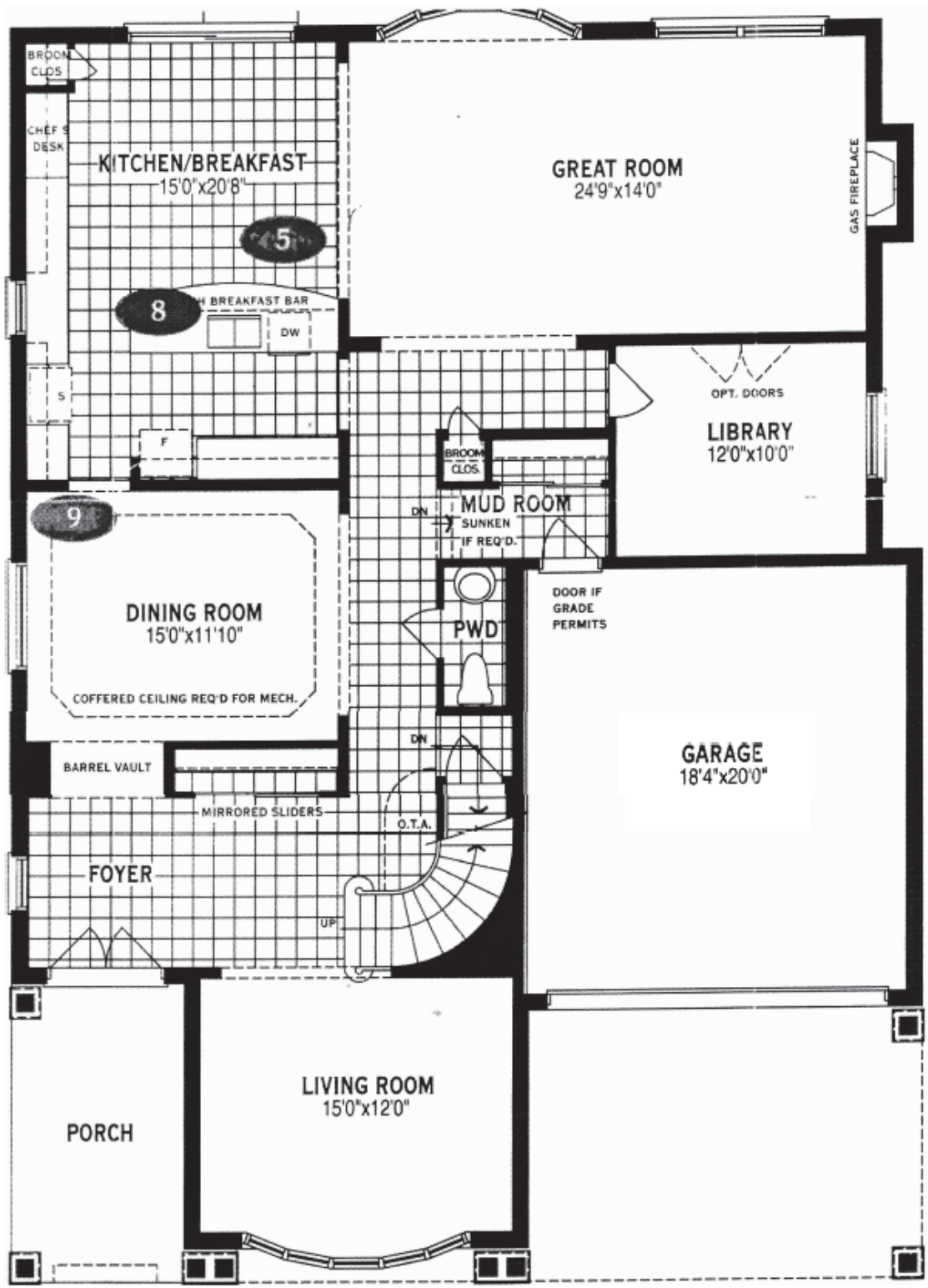


Figure A-2: Ground (First) Floor plan

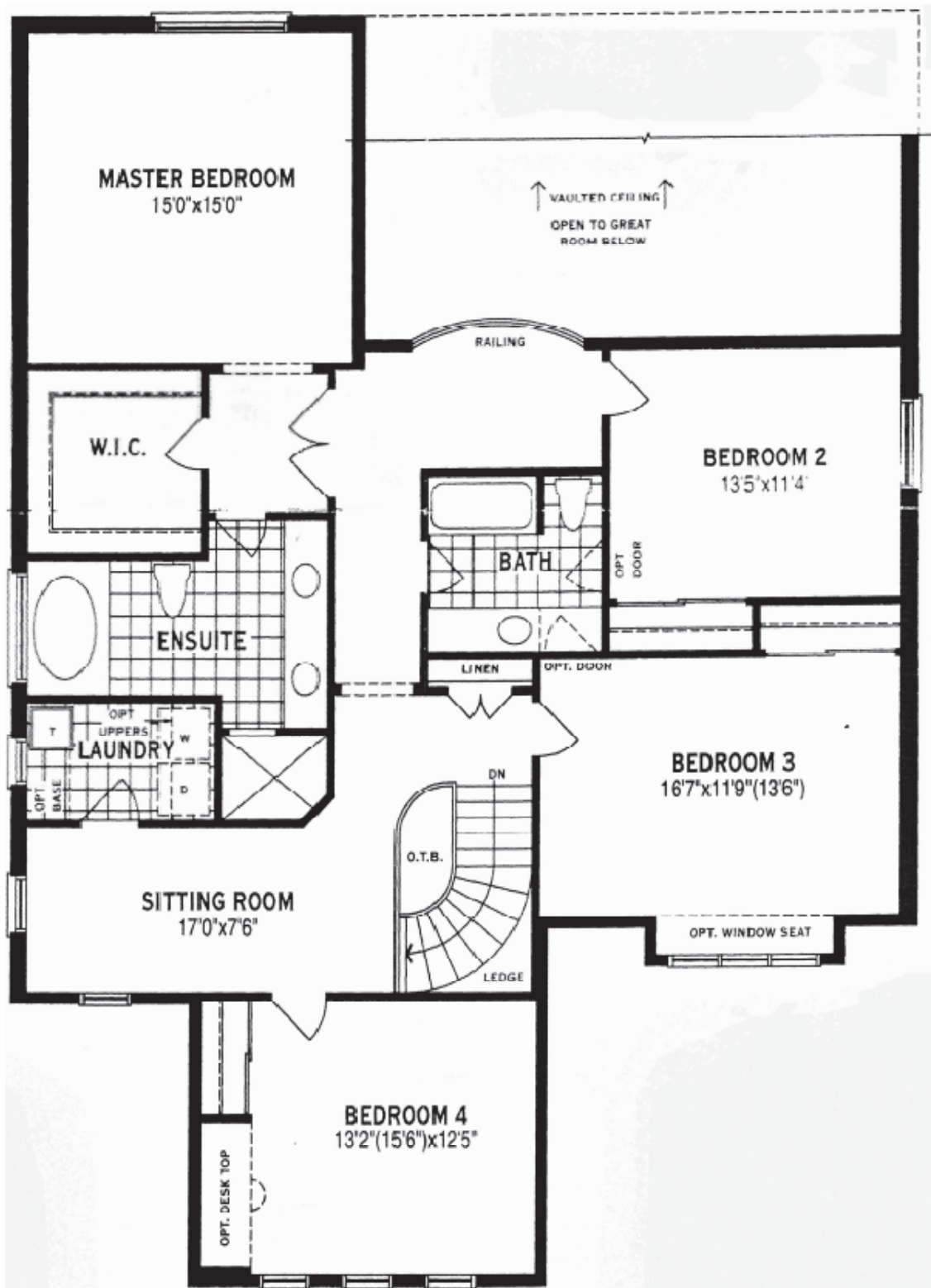


Figure A-3: Second Floor plan

Appendix - B

HOT2000 output report for the house



File: Mattamy 04060-HV5018GH-C-CORNER AS BUILT (EDIT)_Thesis_Used.HSE
Application Type: General

Weather Data for TORONTO, ONTARIO

Builder Code:

Data Entry by: Farzin Rad
Date of entry: 21/01/2007
Company: Ryerson University

Client name: Homes, Mattamy
Street address: Lot 213

City: Milton
Postal code:

Region: Ontario
Telephone:

GENERAL HOUSE CHARACTERISTICS

House type: Single Detached
Number of storeys: Two storeys
Plan shape: Other, 11 or more corners
Front orientation: South
Year House Built: 2005
Wall colour: Default
Roof colour: Medium brown
Soil Condition: Normal conductivity (dry sand, loam, clay)
Water Table Level: Normal (7-10m/23-33ft)

Absorptivity: 0.40
Absorptivity: 0.84

House Thermal Mass Level: (A) Light, wood frame

Effective mass fraction 1.000

Occupants :
2 Adults for 50.0% of the time
2 Children for 50.0% of the time
0 Infants for 0.0% of the time

Sensible Internal Heat Gain From Occupants: 2.40 kWh/day

HOUSE TEMPERATURES

Heating Temperatures

Main Floor:	21.1 °C
Basement:	20.0 °C
TEMP. Rise from 21.1 °C:	2.8 °C
Cooling Temperature: Main Floor :	23.89 °C

Basement is- Heated: YES Cooled: NO Separate T/S: NO
 Fraction of internal gains released in basement : 0.150

Indoor design temperatures for equipment sizing

Heating:	22.2 °C
Cooling:	23.9 °C

WINDOW CHARACTERISTICS

Label	Location	#	Overhang Width (m)	Header Height (m)	Tilt deg	Curtain Factor	Shutter (RSI)
South							
door window	fr / ext	1	5.49	0.91	90.0	1.00	0.00
door window copy	fr / ext 2	1	5.49	0.91	90.0	1.00	0.00
front 1	1st Flr. Stone	1	5.55	0.46	90.0	0.00	0.00
front 1	2nd Flr. Siding	1	0.40	0.15	90.0	0.00	0.00
front 2	1st Flr. Stone	2	1.77	0.15	90.0	0.00	0.00
front 2	2nd Flr. Siding	2	0.24	0.15	90.0	0.00	0.00
front 3	2nd Flr. Siding	1	0.24	0.15	90.0	0.00	0.00
front 4	2nd Flr. Siding	3	0.40	0.15	90.0	0.00	0.00
East							
right 1	1st Flr. Siding	1	0.40	4.72	90.0	0.00	0.00
right 1	2nd Flr. Siding	1	0.40	1.62	90.0	0.00	0.00
right basement	Basement	1	0.40	3.20	90.0	0.00	0.00
North							
back 1	1st Flr. Siding	3	0.40	0.51	90.0	0.00	0.00
back 1	2nd Flr. Siding	2	0.40	0.15	90.0	0.00	0.00
back 2	1st Flr. Siding	5	0.40	0.30	90.0	0.00	0.00
back 3	1st Flr. Siding	1	0.40	3.20	90.0	0.00	0.00
back basement	Basement	1	0.40	3.20	90.0	0.00	0.00
West							
left 1	1st Flr. Stone	2	3.66	0.46	90.0	0.00	0.00
left 1	1st Flr. Siding	2	0.40	3.23	90.0	0.00	0.00
left 1	2nd Flr. Siding	2	0.40	0.15	90.0	0.00	0.00
left 2	1st Flr. Siding	2	0.24	0.15	90.0	0.00	0.00
left 2	2nd Flr. Siding	5	0.40	0.15	90.0	0.00	0.00
left 3	1st Flr. Siding	1	0.24	0.15	90.0	0.00	0.00
left 4	1st Flr. Siding	2	0.40	0.46	90.0	0.00	0.00
left basement 1	Basement	1	0.40	6.04	90.0	0.00	0.00
left basement 2	Basement	1	0.40	2.96	90.0	0.00	0.00

Label	Type	#	Window Width (m)	Window Height (m)	Total Area (m ²)	Window RSI	SHGC
South							
door window	18 W	1	0.61	1.07	0.65	0.506	0.3205
door window copy	18 W	1	0.61	1.07	0.65	0.506	0.3205
front 1	18 W	1	1.73	0.30	0.53	0.460	0.2528
front 1	18 W	1	0.63	1.09	0.69	0.510	0.3256
front 2	18 W	2	1.24	1.75	4.36	0.570	0.3969
front 2	18 W	2	0.79	1.75	2.76	0.546	0.3698
front 3	18 W	1	1.14	1.75	2.00	0.566	0.3928
front 4	18 W	3	0.63	1.75	3.34	0.531	0.3522
East							
right 1	18 W	1	1.24	1.75	2.18	0.570	0.3969
right 1	18 W	1	1.24	1.55	1.93	0.564	0.3903
right basement	18 W	1	0.76	0.30	0.23	0.443	0.2140
North							
back 1	18 W	3	0.79	1.75	4.14	0.546	0.3698
back 1	18 W	2	0.79	1.45	2.28	0.537	0.3601
back 2	18 W	5	0.53	1.75	4.67	0.517	0.3348
back 3	18 W	1	2.44	2.39	5.82	0.610	0.4342
back basement	18 W	1	0.76	0.30	0.23	0.443	0.2140
West							
left 1	18 W	2	0.63	1.75	2.23	0.531	0.3522
left 1	18 W	2	0.79	1.75	2.76	0.546	0.3698
left 1	18 W	2	0.79	1.75	2.76	0.546	0.3698
left 2	18 W	2	0.53	1.75	1.87	0.517	0.3348
left 2	18 W	5	0.63	1.75	5.56	0.531	0.3522
left 3	18 W	1	1.22	1.75	2.14	0.569	0.3959
left 4	18 W	2	0.63	1.75	2.23	0.531	0.3522
left basement 1	18 W	1	0.76	0.30	0.23	0.443	0.2140
left basement 2	18 W	1	0.76	0.30	0.23	0.443	0.2140

WINDOW CODE SCHEDULE

Name	Internal Code	Description (Glazings, Coatings, Fill, Spacer, Type, Frame)
18 W	213224	Double/double with 1 coat, Low-E .04 (soft), 13 mm Argon, Insulating, Slider with sash, Vinyl, ER* = -13.90, Eff. RSI= 0.38

* Window Standard Energy Rating estimated for assumed dimensions, and Air tightness type: CSA - A1; Leakage rate = 2.790 m³/hr/m

BUILDING PARAMETER DETAILS

CEILING COMPONENTS

	Construction Type	Code Type	Roof Slope	Heel Ht.(m)	Section Area (m ²)	R. Value (RSI)
1st Flr. Alcoves	Attic/hip	18 Ceil	6.0/12	0.24	1.67	7.33
2nd Floor Flat	Attic/gable	18 Ceil	8.0/12	0.24	146.17	7.07
Bdrm 4 Cathdral	Cathedral	18 Cath	8.0/12	0.24	3.02	5.95
Greatroom Cathdr	Cathedral	18 Cath	7.6/12	0.24	40.03	6.48

MAIN WALL COMPONENTS

Label	Lintel Type	Fac. Dir	Number of Corn.	Number of Inter.	Height (m)	Perim. (m)	Area (m ²)	R. Value (RSI)
1st Flr. Siding Type: 18Wall	101	N/A	17	2	3.02	33.43	101.09	3.43
1st Flr. Stone Type: 18Wall	101	N/A	5	0	3.02	15.40	46.58	3.55
2nd Flr. Siding Type: 18Wall	101	N/A	15	6	2.77	53.14	147.06	3.65
2nd Flr.to Attic Type: 18Wall	101	N/A	4	0	2.67	7.62	20.32	3.85
Garage Wall Type: 18Wall	N/A	N/A	1	2	3.02	11.13	33.64	3.90
F. H. 1st Siding Type: 18002C0020	000	N/A	4	4	0.23	26.17	5.98	3.18
F. H. 1st Stone Type: 18002C0070	000	N/A	4	4	0.23	22.67	5.18	3.32
F. H. 2nd Siding Type: 18002C0020	000	N/A	4	4	0.23	53.14	12.15	3.18
F. H. 2nd Siding Type: 18002C0000	000	N/A	4	4	0.23	7.62	1.74	3.06

WALL CODE SCHEDULE

Name	Internal Code	Description (Structure, typ/size, Spacing, Insull, 2, Int., Sheathing, Exterior, Studs)
18002C0020	18002C0020	Floor header, N/A, N/A, RSI 2.1 (R 12) batt, N/A, None, None, Hollow metal/vinyl cladding, 2 studs
18002C0070	18002C0070	Floor header, N/A, N/A, RSI 2.1 (R 12) batt, N/A, None, None, Stone, 2 studs
18002C0000	18002C0000	Floor header, N/A, N/A, RSI 2.1 (R 12) batt, N/A, None, None, None, 2 studs

EXPOSED FLOORS

Label	Floor Code Type	Area (m ²)	R. Value (RSI)
Bdrm 4 Window	18 ExFlr	1.53	5.59
Over Garage	18 ExFlr	24.08	5.55

EXPOSED FLOOR SCHEDULE

Name	Internal Code	Description (Structure, typ/size, Spacing, Insull, 2, Int., Sheathing, Exterior, Studs)
18 ExFlr		N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A

DOORS

Label	Type	Height (m)	Width (m)	Gross Area (m ²)	R. Value (RSI)
fr / ext Loc: 1st Flr. Stone	Steel polystyrene core	2.03	0.86	1.75	0.98
fr / ext 2 Loc: 1st Flr. Stone	Steel polystyrene core	2.03	0.86	1.75	0.98
garage / foyer Loc: Garage Wall	Steel polystyrene core	2.03	0.81	1.65	0.98

USER-DEFINED STRUCTURE CODES SCHEDULE

Name	Description
1118Wall	
2118 Ceil	
2118 Cath	
3118 ExFlr	

FOUNDATIONS

Foundation Name:	Basement	Volume:	402.5 m ³
Foundation Type:	Basement	Opening to Main Floor:	1.56 m ²
Data Type:	Library		
Total Wall Height:	2.59 m	Non-Rectangular Floor Perimeter:	61.30 m
Depth Below Grade:	1.98 m	Floor Area:	155.36 m ²
Interior wall type:	18 BWall	R-value:	2.22 RSI
Exterior wall type:	64 mm (2.5 in) XTPS IV	R-Value:	2.22 RSI
Number of corners :	19		
Lintel type:	N/A		
Added to slab type :	User specified	R-Value:	2.22 RSI
Floors Above Found.:	4221000240	R-Value:	0.60 RSI

Exposed areas for: Basement
Exposed Perimeter: 61.30m

Configuration: BCCB_4
 - concrete walls and floor
 - interior surface of wall insulated over full-height
 - exterior surface of wall insulated over full-height
 - sub-surface of floor slab fully insulated but no insulation under footings
 - thermal-break between walls and floor slab
 - any first storey construction type

FOUNDATION CODE SCHEDULE

Added To Slab

Name	Code	Description (Framing, Spacing, Insulation, Int., Sheathing)
64 mm XTPS IV (2	00B00	None, 305 mm (12 in), N/A, None, None

Floors Above Foundation

Name	Internal Code	Description (Structure, typ/size, Spacing, Insul1, 2, Int., Sheathing, Exterior, Drop Framing)
4221000240	4221000240	Wood frame, 38x184 (2x8), 400 mm (16 in), None, None, None, Waferboard/OSB 11.1 mm (7/16 in), Tile-linoleum, No

ROOF CAVITY INPUTS

Gable Ends		Total Area:	32.50 m ²
Sheathing Material:	Plywood/Part. bd 9.5 mm (3/8 in)		0.08 RSI
Exterior Material:	Hollow metal/vinyl cladding		0.11 RSI
Sloped Roof		Total Area:	177.58 m ²
Sheathing Material:	Plywood/Part. bd 12.7 mm (1/2 in)		0.11 RSI
Exterior Material:	Asphalt shingles		0.08 RSI
Total Cavity Volume:	240.8 m ³	Ventilation Rate:	0.50 ACH/hr

BUILDING ASSEMBLY DETAILS

Label	Construction Code	Nominal (RSI)	System (RSI)	Effective (RSI)
CEILING COMPONENTS				
1st Flr. Alcoves	18 Ceil	7.05	7.04	7.33
2nd Floor Flat	18 Ceil	7.05	7.06	7.07
Bdrm 4 Cathdral	18 Cath	7.14	5.95	5.95
Greatroom Cathdr	18 Cath	7.14	6.48	6.48
MAIN WALL COMPONENTS				
1st Flr. Siding	18Wall	4.38	3.43	3.43
1st Flr. Stone	18Wall	4.38	3.55	3.55
2nd Flr. Siding	18Wall	4.38	3.65	3.65
2nd Flr.to Attic	18Wall	4.38	3.85	3.85
Garage Wall	18Wall	4.38	3.90	3.90
F. H. 1st Siding	18002C0020	2.80	3.18	3.18
F. H. 1st Stone	18002C0070	2.80	3.32	3.32
F. H. 2nd Siding	18002C0020	2.80	3.18	3.18
F. H. 2nd Siding	18002C0000	2.80	3.06	3.06
FLOORS ABOVE BASEMENTS				
Basement	4221000240	0.00	0.60	0.60

BUILDING PARAMETERS SUMMARY

ZONE 1 : Above Grade

Component	Area m ² Gross	Area m ² Net	Effective (RSI)	Heat Loss MJ	% Annual Heat Loss
Ceiling	190.90	190.90	6.92	9604.64	6.82
Main Walls	373.74	314.33	3.58	35913.80	25.50
Doors	5.16	3.86	0.98	1729.17	1.23
Exposed floors	25.61	25.61	5.55	1859.09	1.32
South Windows	14.99	14.99	0.54	12128.10	8.61
East Windows	4.11	4.11	0.57	3183.34	2.26
North Windows	16.92	16.92	0.56	13364.10	9.49
West Windows	19.54	19.54	0.54	15969.16	11.34
ZONE 1 Totals:				93751.41	66.55

INTER-ZONE Heat Transfer : Floors Above Basement

Area m ² Gross	Area m ² Net	Effective (RSI)	Heat Loss MJ
155.36	155.36	0.597	10515.30

ZONE 2 : Basement

Component	Area m ² Gross	Area m ² Net	Effective (RSI)	Heat Loss MJ	% Annual Heat Loss
Walls above grade	37.37	36.44	-	5216.37	3.70
East windows	0.23	0.23	0.44	213.54	0.15
North windows	0.23	0.23	0.44	213.54	0.15
West windows	0.46	0.46	0.44	427.08	0.30

Below grade foundation	276.80	276.80	-	14189.35	10.07
ZONE 2 Totals:				20259.87	14.38

Ventilation

House Volume	Air Change	Heat Loss MJ	% Annual Heat Loss
1323.30 m ³	0.378 ACH	26852.834	19.06

AIR LEAKAGE AND VENTILATION

Building Envelope Surface Area: 904.42 m²

Air Leakage Test Results at 50 Pa.(0.2 in H₂O) = 1.41 ACH

Equivalent Leakage Area @ 10 Pa = 696.69 cm²

Terrain Description	Height	m
@ Weather Station : Open flat terrain, grass	Anemometer	10.0
@ Building site : Suburban, forest	Bldg. Eaves	6.4

Local Shielding: **Walls:** Light
 Flue : None

Leakage Fractions- **Ceiling:** 0.200 **Walls:** 0.650 **Floors:** 0.150
Normalized Leakage Area @ 10 Pa: 0.7703 cm²/m²
Estimated Airflow to cause a 5 Pa Pressure Difference: 111 L/s
Estimated Airflow to cause a 10 Pa Pressure Difference: 174 L/s

F326 VENTILATION REQUIREMENTS

Kitchen, Living Room, Dining Room	3 rooms @ 5.0 L/s: 15.0 L/s
Utility Room	1 rooms @ 5.0 L/s: 5.0 L/s
Bedroom	1 rooms @ 10.0 L/s: 10.0 L/s
Bedroom	2 rooms @ 5.0 L/s: 10.0 L/s
Bathroom	2 rooms @ 5.0 L/s: 10.0 L/s
Basement Rooms	: 10.0 L/s

CENTRAL VENTILATION SYSTEM

System Type: HRV
Manufacturer: VanEE
Model Number: 2001 HRV (Gold Series)

Fan and Preheater Power at 0.0 °C:	124 Watts
Fan and Preheater Power at -25.0 °C:	114 Watts
Preheater Capacity:	0 Watts
Sensible Heat Recovery Efficiency at 0.0 °C	80%
Sensible Heat Recovery Efficiency at -25.0 °C	80%
Total Heat Recovery Efficiency in Cooling Mode	25%

Low Temperature Ventilation Reduction:	0%
Low Temperature Ventilation Reduction: Airflow Adjustment	(0%)

Vented combustion appliance depressurization limit: 5.00 Pa.

Ventilation Supply Duct

Location:	Main floor	Type:	Flexible
Length:	1.5 m	Diameter:	152.4 mm

Insulation: 0.7 RSI **Sealing Characteristics:** Sealed

Ventilation Exhaust Duct

Location: Main floor **Type:** Flexible
Length: 1.5 m **Diameter:** 152.4 mm
Insulation: 0.7 RSI **Sealing Characteristics:** Sealed

SECONDARY FANS & OTHER EXHAUST APPLIANCES

	Control	Supply (L/s)	Exhaust (L/s)
Dryer	Continuous	-	1.20

Dryer is vented outdoors

AIR LEAKAGE AND VENTILATION SUMMARY

F326 Required continous ventilation: 60.000 L/s (0.16 ACH)
Central Ventilation Supply Rate (): 110.908 L/s (0.30 ACH)
Total house ventilation is Balanced
Gross Air Leakage and Ventilation Energy Load: 73105.164 MJ
Seasonal Heat Recovery Ventilator Efficiency: 79.436 %
Estimated Ventilation Electrical Load: Heating Hours: 3533.697 MJ
Estimated Ventilation Electrical Load: Non-Heating Hours: 373.219 MJ
Net Air Leakage and Ventilation Load: 28619.682 MJ

SPACE HEATING SYSTEM

Primary Space Heating Fuel: Natural Gas
Space Heating Equipment: Ground Source Heat Pump
Manufacturer: Atlas
Model: ATO60

Capacity at XT3 °C: 0.00 kW
COP at XT3 °C: 3.82
Crankcase Heater Power: 60.00 watts
Heat Pump Temperature Cut-Off: Balance point

SPACE HEATING SYSTEM

Secondary Heating Fuel: Electricity
Equipment: Baseboard/Hydronic/Plenum(duct) htrs.
Manufacturer:
Model:
Calculated* Output Capacity: 18.00 kW
* Design Heat loss X 1.00 + 0.5 kW
Steady State Efficiency: 50.00 %
Fan Mode: Auto
Low Speed Fan Power: 0 watts
High Speed Fan Power: 791 watts

AIR CONDITIONING SYSTEM

System Type: Conventional A/C
Manufacturer:
Model:
Capacity: 10776 Watts
SEER 14.70
Sensible Heat Ratio: 0.76
Indoor Fan Flow Rate: 600.69 L/s
Ventilator Flow Rate: 0.00 L/s
Fraction of windows Openable 0.00
Economizer control: N/A

Rated COP	3.1
Fan Power (watts)	465.54
Crankcase Heater Power (watts):	60.00

Indoor Fan Operation: Continuous

Air Conditioner is integrated with the Heating System

DOMESTIC WATER HEATING SYSTEM

Primary Water Heating Fuel: Solar
Water Heating Equipment: Solar collector system
Manufacturer: Enerworks
Model: EWRA2
CSIA Solar Collector Rating: 10400.00 MJ/Year

Secondary Water Heating Fuel:	Solar
Water Heating Equipment:	B-Medium, Wood frame
Manufacturer:	Enerworks
Model:	EWRA2
CSIA Solar Collector Rating:	MJ/Year

ANNUAL SPACE HEATING SUMMARY

Design Heat Loss at -17.20 °C (13.43 Watts / m3):	17774.13 Watts
Including credit for HRV (0.00 Watts / m3):	0.00
Gross Space Heat Loss:	140864.11 MJ
Gross Space Heating Load:	139450.69 MJ
Usable Internal Gains:	24173.33 MJ
Usable Internal Gains Fraction:	17.16 %
Usable Solar Gains:	24260.95 MJ
Usable Solar Gains Fraction:	17.22 %
Auxiliary Energy Required:	91016.44 MJ
Space Heating System Load:	91016.41 MJ
Heat Pump and Furnace Annual COP:	2.94
Heat Pump Annual Energy Consumption:	27269.14 MJ
Furnace/Boiler Annual Energy Consumption:	1694.82 MJ
Annual Space Heating Energy Consumption:	28963.96 MJ

ANNUAL SPACE COOLING SUMMARY

Design Cooling Load for July at 31.00 °C:	10727.38 Watts
Design Sensible Heat Ratio:	0.77
Estimated Annual Space Cooling Energy:	1654.89
Seasonal COP (May to October):	3.45

ANNUAL DOMESTIC WATER HEATING SUMMARY

Daily Hot Water Consumption:	225.00 Litres
Hot Water Temperature:	55.00 °C
Estimated Domestic Water Heating Load:	15341.32 MJ
Solar Domestic Water Heating System Contribution:	8755.98 MJ
Domestic Water Heating Energy Consumption:	7621.24 MJ
System Seasonal Efficiency:	Secondary 86.41

BASE LOADS SUMMARY

	kwh/day	Annual kWh
Interior Lighting	1.00	365.00
Appliances	14.00	5110.00

Other	3.00	1095.00
Exterior Use	4.00	1460.00
HVAC Fans		
HRV/Exhaust	2.97	1085.25
Space Heating	1.50	547.56
Space Cooling	3.42	1249.88
Total Average Electrical Load	29.90	10912.69

FAN OPERATION SUMMARY (kWh)

Hours	HRV/Exhaust Fans	Space Heating	Space Cooling
Heating	981.58	547.56	0.00
Neither	0.00	0.00	1023.36
Cooling	103.67	0.00	226.51
Total	1085.25	547.56	1249.88

ENERGY CONSUMPTION SUMMARY REPORT

Estimated Annual Space Heating Energy Consumption	= 37395.54 MJ	= 10387.65 kWh
Ventilator Electrical Consumption: Heating Hours	= 3533.70 MJ	= 981.58 kWh
Estimated Annual DHW Heating Energy Consumption	= 7621.24 MJ	= 2117.01 kWh
ESTIMATED ANNUAL SPACE + DHW ENERGY CONSUMPTION	= 48550.48 MJ	= 13486.24 kWh
Estimated Greenhouse Gas Emissions	12.47 tonnes/year	

ESTIMATED ANNUAL FUEL CONSUMPTION SUMMARY

Fuel	Space Heating	Space Cooling	DHW Heating	Appliance	Total
Natural Gas (m3)	173.39	0.00	0.00	0.00	173.39
Electricity (kWh)	9574.68	1654.89	2117.01	9053.36	22399.95

ESTIMATED ANNUAL FUEL CONSUMPTION COSTS

Fuel Costs Library = C:\PROGRA~1\H2KEGH~1\Stdlibs\FuelLib.FLC

RATE	Electricity (Ottawa97)	Natural Gas (Ottawa97)	Oil (Ottawa97)	Propane (Ottawa97)	Wood (Sth Ont)	Total
\$	1781.58	135.62	0.00	0.00	0.00	1917.20

MONTHLY ENERGY PROFILE

Month	Energy Load (MJ)	Internal Gains (MJ)	Solar Gains (MJ)	Aux. Energy (MJ)	HRV Eff. %
Jan	24332.2	2296.4	2613.1	19422.8	79.4
Feb	21310.6	2067.8	3049.3	16193.4	79.4
Mar	19092.6	2296.8	3751.8	13044.0	79.4
Apr	12490.5	2241.9	3210.5	7038.2	79.4
May	7493.9	2343.3	2860.4	2290.2	79.4
Jun	2397.6	1700.0	697.6	0.0	79.5
Jul	819.0	794.1	25.0	0.0	79.5
Aug	1284.1	1168.1	116.0	0.0	79.5
Sep	4525.5	2312.2	1837.8	375.6	79.5
Oct	9755.4	2369.8	2549.9	4835.8	79.4
Nov	14622.3	2267.2	1583.4	10771.7	79.4
Dec	21326.9	2315.9	1966.2	17044.8	79.4
Ann	139450.7	24173.3	24260.9	91016.4	79.4

FOUNDATION ENERGY PROFILE

Month	Heat Loss (MJ)				Total
	Crawl Space	Slab	Basement	Walkout	
Jan	0.0	0.0	1240.5	0.0	1240.5
Feb	0.0	0.0	1034.1	0.0	1034.1
Mar	0.0	0.0	832.9	0.0	832.9
Apr	0.0	0.0	449.4	0.0	449.4
May	0.0	0.0	146.2	0.0	146.2
Jun	0.0	0.0	0.0	0.0	0.0
Jul	0.0	0.0	0.0	0.0	0.0
Aug	0.0	0.0	0.0	0.0	0.0
Sep	0.0	0.0	24.0	0.0	24.0
Oct	0.0	0.0	308.8	0.0	308.8
Nov	0.0	0.0	687.8	0.0	687.8
Dec	0.0	0.0	1088.4	0.0	1088.4
Ann	0.0	0.0	5812.1	0.0	5812.1

FOUNDATION TEMPERATURES & VENTILATION PROFILE

Month	Temperature (Deg °C)			Air Change Rate		Heat Loss (MJ)
	Crawl Space	Basement	Walkout	Natural	Total	
Jan	0.0	20.0	0.0	0.112	0.417	5463.8
Feb	0.0	19.9	0.0	0.108	0.413	4694.9
Mar	0.0	19.8	0.0	0.098	0.403	3949.1
Apr	0.0	19.9	0.0	0.082	0.387	2273.0
May	0.0	20.1	0.0	0.061	0.366	1072.0
Jun	0.0	20.5	0.0	0.045	0.350	171.9
Jul	0.0	21.3	0.0	0.038	0.343	-97.5

Aug	0.0	21.2	0.0	0.038	0.343	-11.9
Sep	0.0	20.6	0.0	0.048	0.353	494.1
Oct	0.0	20.4	0.0	0.065	0.370	1555.9
Nov	0.0	20.3	0.0	0.085	0.390	2754.6
Dec	0.0	20.1	0.0	0.101	0.406	4532.9
Ann	0.0	20.3	0.0	0.073	0.378	26852.8

SPACE HEATING SYSTEM PERFORMANCE

Month	Space Heating Load (MJ)	Furnace Input (MJ)	Pilot Light (MJ)	Indoor Fans (MJ)	Heat Pump Input (MJ)	Total Input (MJ)	System Cop
Jan	19422.8	676.1	0.0	431.6	5725.8	6833.5	2.8
Feb	16193.4	420.8	0.0	386.2	4998.0	5805.0	2.8
Mar	13043.9	109.3	0.0	314.9	4174.5	4598.7	2.8
Apr	7038.2	67.7	0.0	161.0	2252.6	2481.4	2.8
May	2290.2	35.7	0.0	47.6	729.2	812.5	2.8
Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sep	375.6	6.7	0.0	6.4	140.4	153.5	2.4
Oct	4835.8	55.1	0.0	83.6	1348.6	1487.4	3.3
Nov	10771.7	78.3	0.0	197.3	3025.4	3301.0	3.3
Dec	17044.8	245.0	0.0	342.7	4874.5	5462.2	3.1
Ann	91016.4	1694.8	27269.1	1971.2	0.0	30935.2	2.9

AIR CONDITIONING SYSTEM PERFORMANCE

Month	Sensible	Latent	AirCond	Fan	Ventilator	Total	COP	Av.RH
Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
May	796.6	149.0	66.1	287.7	0.0	146.1	3.4	35.1
Jun	2810.4	867.0	254.1	1206.7	0.0	599.2	3.3	42.3
Jul	5191.3	1918.2	474.3	1246.9	0.0	823.7	3.5	45.7
Aug	4184.7	1650.5	392.6	1246.9	0.0	744.8	3.5	46.7
Sep	1114.9	395.7	105.8	451.3	0.0	231.2	3.4	44.0
Oct	137.5	46.1	13.0	60.1	0.0	29.7	3.3	42.5
Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ann	14235.4	5026.5	1305.9	4499.6	0.0	2574.6	3.4	44.2

MONTHLY ESTIMATED ENERGY CONSUMPTION BY DEVICE (MJ)

Month	Space Heating		DHW Heating		Lights & Appliances	HRV & FANS	Air Conditioner
	Primary	Secondary	Primary	Secondary			
Jan	5725.8	1224.8	0.0	1242.0	2455.2	762.2	0.0
Feb	4998.0	916.4	0.0	954.8	2217.6	685.0	0.0
Mar	4174.5	658.0	0.0	867.7	2455.2	646.8	0.0
Apr	2252.6	598.7	0.0	434.5	2376.0	482.4	0.0
May	729.2	584.4	0.0	297.5	2455.2	667.4	238.1
Jun	0.0	531.0	0.0	85.3	2376.0	1528.1	950.5
Jul	0.0	548.7	0.0	88.2	2455.2	1579.0	1718.3
Aug	0.0	548.7	0.0	116.9	2455.2	1579.0	1434.3
Sep	140.4	537.7	0.0	398.9	2376.0	779.1	380.9
Oct	1348.6	603.8	0.0	792.3	2455.2	475.8	46.8
Nov	3025.4	609.3	0.0	1085.1	2376.0	518.7	0.0
Dec	4874.5	793.7	0.0	1258.1	2455.2	674.1	0.0
Ann	27269.1	8155.2	0.0	7621.2	28908.0	10377.7	4768.9

MONTHLY ESTIMATED SOLAR DHW CONTRIBUTION (MJ)

Month	DHW Heating
	Primary
Jan	300.1
Feb	459.4
Mar	675.0
Apr	996.9
May	1094.5
Jun	1178.2
Jul	1154.1
Aug	1102.1
Sep	801.8
Oct	512.3
Nov	261.4
Dec	220.3
Ann	8756.0

ESTIMATED FUEL COSTS (Dollars)

Month	Electricity	Natural Gas	Oil	Propane	Wood	Total
Jan	229.2	11.4	0.0	0.0	0.0	240.6
Feb	198.3	11.0	0.0	0.0	0.0	209.4
Mar	178.4	11.4	0.0	0.0	0.0	189.7
Apr	126.9	11.3	0.0	0.0	0.0	138.1
May	103.7	11.4	0.0	0.0	0.0	115.0
Jun	113.8	11.3	0.0	0.0	0.0	125.0
Jul	131.3	11.4	0.0	0.0	0.0	142.7
Aug	126.3	11.4	0.0	0.0	0.0	137.7
Sep	97.0	11.3	0.0	0.0	0.0	108.3

Oct	118.3	11.4	0.0	0.0	0.0	129.7
Nov	155.6	11.3	0.0	0.0	0.0	166.8
Dec	202.8	11.4	0.0	0.0	0.0	214.2
Ann	1781.6	135.6	0.0	0.0	0.0	1917.2

The calculated heat losses and energy consumptions are only estimates, based upon the data entered and assumptions within the program. Actual energy consumption and heat losses will be influenced by construction practices, localized weather, equipment characteristics and the lifestyle of the occupants.