



File: REEP House (after).HSE
Application Type: General

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Weather Data for TORONTO MET RES STN, ONTARIO

Builder Code: 11W2E00452

Data Entry by: Chris Albrecht
Date of entry: 2011-05-19
Company: Waterloo Region Green Solutions

Client name: Region, of Waterloo
Street address: 20 Mill Street

City: Kitchener
Postal code: N2G 2Y3
Region: Ontario
Telephone: 519-744-6583

Mailing address: 222 Frederick Street
City: Kitchener
Postal Code: N2H 2M8
Region: Ontario

GENERAL HOUSE CHARACTERISTICS

House type: Single Detached
Number of storeys: Two storeys
Plan shape: Rectangular
Front orientation: Southwest
Year House Built: 1920
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: (C) Heavy, masonry

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:	21.0 °C
Basement:	19.0 °C
TEMP. Rise from 21.0 °C:	2.8 °C
Cooling Temperature: Main Floor :	25.00 °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:	22.0 °C
Cooling:	24.0 °C

WINDOW CHARACTERISTICS

Label	Location	#	Overhang Width (m)	Header Height (m)	Tilt deg	Curtain Factor	Shutter (RSI)
South							
Window - 16	Door-02	1	0.00	0.00	90.0	1.00	0.00
Southeast							
SE/bath - orig	2nd floor walls	1	0.41	0.20	90.0	1.00	0.00
SE/bath - s.wood	2nd floor walls	1	0.41	2.39	90.0	1.00	0.00
SE/front 3rd flr	3rd floor ends	1	0.41	0.20	90.0	1.00	0.00
SE/right back bs	Foundation - 1	1	0.41	5.14	90.0	1.00	0.00
SE/right front b	Foundation - 1	1	0.41	5.14	90.0	1.00	0.00
SE/right ktchn 1	Main floor	1	0.41	2.39	90.0	1.00	0.00
SE/right ktchn 2	Main floor	1	0.41	2.39	90.0	1.00	0.00
Northeast							
NE/back	Main floor	1	0.41	2.39	90.0	1.00	0.00
NE/back office	2nd floor walls	1	0.41	0.20	90.0	1.00	0.00
North							
Window - 15	Door-01	1	0.00	0.00	90.0	1.00	0.00
Northwest							
NW/left	Main floor	1	0.41	2.39	90.0	1.00	0.00
SW/left back bsm	Foundation - 1	1	0.41	5.14	90.0	1.00	0.00
Southwest							
SW/front	Main floor	1	0.41	2.39	90.0	1.00	0.00
SW/front - dg	2nd floor walls	1	0.41	0.20	90.0	1.00	0.00
SW/front - tg	2nd floor walls	1	0.41	2.39	90.0	1.00	0.00
Label	Type	#	Window Width (m)	Window Height (m)	Total Area (m ²)	Window RSI	SHGC
South							
Window - 16	233202	1	0.61	0.91	0.56	0.508	0.5663
Southeast							

SE/bath - orig	200202	1	0.68	1.01	0.69	0.362	0.6203
SE/bath - s.wood	233202	1	0.55	0.83	0.46	0.504	0.5525
SE/front 3rd flr	436206	1	0.68	1.01	0.69	0.901	0.4441
SE/right back bs	436206	1	0.26	0.39	0.10	0.750	0.2847
SE/right front b	436206	1	0.26	0.39	0.10	0.750	0.2847
SE/right ktchn 1	436206	1	0.55	0.83	0.46	0.869	0.4199
SE/right ktchn 2	436206	1	0.55	0.83	0.46	0.869	0.4199
Northeast							
NE/back	436206	1	1.06	1.58	1.67	0.963	0.4841
NE/back office	436206	1	0.96	1.43	1.37	0.951	0.4767
North							
Window - 15	233206	1	0.56	1.52	0.85	0.558	0.5619
Northwest							
NW/left	436206	1	0.96	1.43	1.37	0.951	0.4767
SW/left back bsm	436206	1	0.26	0.39	0.10	0.750	0.2847
Southwest							
SW/front	233206	1	0.84	1.25	1.05	0.560	0.5897
SW/front - dg	236206	1	1.19	1.77	2.11	0.581	0.6238
SW/front - tg	436206	1	0.84	1.25	1.05	0.933	0.4655

WINDOW CODE SCHEDULE

Name	Internal Code	Description (Glazings, Coatings, Fill, Spacer, Type, Frame)
233202	233202	Double/double with 1 coat, Low-E .20 (hard1), 13 mm Argon, Insulating, Picture, Wood, RE* = 2.507, Eff. RSI= 0.53
200202	200202	Double/double with 1 coat, Clear, 13 mm Air, Insulating, Picture, Wood, RE* = -13.847, Eff. RSI= 0.36
436206	436206	TG with 2 coatings, Low-E .20 (hard1), 9 mm Krypton, Insulating, Picture, Fibreglass, RE* = 10.919, Eff. RSI= 0.96
233206	233206	Double/double with 1 coat, Low-E .20 (hard1), 13 mm Argon, Insulating, Picture, Fibreglass, RE* = 3.988, Eff. RSI= 0.56
236206	236206	Double/double with 1 coat, Low-E .20 (hard1), 9 mm Krypton, Insulating, Picture, Fibreglass, RE* = 5.252, Eff. RSI= 0.58

* 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 (m²)	R. Value (RSI)
Sloped	Cathedral	2213UF1000	12.000/12	0.00	64.75	7.84

CEILING CODE SCHEDULE

Name	Internal Code	Description (Structure, typ/size, Spacing, Insull, 2, Int., Sheathing, Exterior, Studs)
2213UF1000	2213UF1000	Wood frame, 38x140 mm (2x6 in), 600 mm (24 in), N/A, N/A, 12 mm (0.5 in) gypsum board, N/A, N/A, N/A

MAIN WALL COMPONENTS

Label	Lintel Type	Fac. Dir	Number of Corn.	Number of Inter.	Height (m)	Perim. (m)	Area (m²)	R. Value (RSI)
2nd floor g ends Type: 16F2UE1000	100	N/A	6	4	0.79	10.30	8.16	4.56
2nd floor walls Type: 16F2UE1000	100	N/A	6	4	1.77	30.24	53.45	4.86
3rd floor ends Type: 16F2UE1000	100	N/A	6	4	1.98	3.96	7.85	4.21
Main floor Type: 16F2UE1000	100	N/A	6	4	2.74	27.80	76.25	4.91
bath gabel end Type: 16F2UE1000	100	N/A	6	4	1.83	1.83	3.34	3.89
MWhdr-02 Type: 1800WG0040		N/A	4	4	0.24	28.65	6.99	6.12
MWhdr-03 copy Type: 1800WG0040		N/A	4	4	0.24	8.53	2.08	6.11

WALL CODE SCHEDULE

Name	Internal Code	Description (Structure, typ/size, Spacing, Insull, 2, Int., Sheathing, Exterior, Studs)
16F2UE1000	16F2UE1000	Solid, N/A, 38 x 89 @ 600 mm (2 x 4 @ 24 in), N/A, N/A, 12 mm (0.5 in) gypsum board, None, None, 2 studs
1800WG0040	1800WG0040	Floor header, N/A, N/A, N/A, N/A, N/A, None, Brick, N/A

DOORS

Label	Type	Height (m)	Width	Gross Area	R. Value
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			(m)	(m ²)	(RSI)
Door-01					
Loc: Main floor	Fibreglass polyurethane core	1.98	0.85	1.68	0.98
Door-02					
Loc: Main floor	Solid wood	1.98	0.85	1.68	0.39

FOUNDATIONS

Foundation Name:	Foundation - 1	Volume:	82.7 m ³
Foundation Type:	Basement	Opening to Main Floor:	0.00 m ²
Data Type:	Library		
Total Wall Height:	2.13 m	Non-Rectangular	
Depth Below Grade:	1.37 m	Floor Perimeter:	25.54 m
		Floor Area:	38.74 m ²
Interior wall type:	230UJ1	R-value:	4.64 RSI
Exterior wall type:	User specified	R-Value:	0.00 RSI
Number of corners :	6		
Lintel type:	Bsmnt Lintel	R-Value:	2.11 RSI
Added to slab type :	User specified	R-Value:	0.72 RSI
Floors Above Found.:	4231000660		

Exposed areas for: Foundation - 1
Exposed Perimeter: 25.54 m

Configuration: BCIA_1
 - concrete walls and floor
 - interior surface of wall insulated over full-height
 - top of slab fully insulated
 - any first storey construction type

FOUNDATION CODE SCHEDULE

Interior Wall

Name	Code	Description (Fram., Spac., Studs, Ins/fram., Xtra ins, Int)
230UJ1	230UJ1	38x89 mm (2x4 in) wood, 600 mm (24 in), 2 studs, N/A, N/A, 12 mm (0.5 in) gypsum board

Floors Above Foundation

Name	Internal Code	Description (Structure, typ/size, Spacing, Insul1, 2, Int., Sheathing, Exterior, Drop Framing)
4231000660	4231000660	Wood frame, 38x235 mm (2x10 in), 400 mm (16 in), None, None, None, Plywood/Particle board 15.5 mm (5/8 in), Wood, No

BASEMENT FLOOR HEADER COMPONENTS

Label	Lintel Type	Fac. Dir	Number of Corn.	Number of Inter.	Height (m)	Perim. (m)	Area (m ²)	R. Value (RSI)
BWhdr01								
Type:	N/A	N/A	4	4	0.24	28.65	6.99	6.12
1800WG0040								

Basement Floor Header Code Schedule

Name	Internal Code	Description (Structure, typ/size, Spacing, Insul1, 2, Int., Sheathing, Exterior, Studs)
1800WG0040	1800WG0040	Floor header, N/A, N/A, N/A, N/A, None, None, Tile-linoleum, No

Lintel Code Schedule

Name	Code	Description (Type, Material, Insulation)
100	100	Double, Wood, None
Bsmnt Lintel	100	Double, Wood, None

ROOF CAVITY INPUTS

Sloped Roof		Total Area:	36.04 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:	12.4 m ³	Ventilation Rate:	0.50 ACH/hr

BUILDING ASSEMBLY DETAILS

Label	Construction Code	Nominal (RSI)	System (RSI)	Effective (RSI)
CEILING COMPONENTS				
Sloped	2213UF1000	8.84	7.84	7.84
MAIN WALL COMPONENTS				
2nd floor g ends	16F2UE1000	5.72	4.56	4.56
2nd floor walls	16F2UE1000	5.72	4.88	4.86
3rd floor ends	16F2UE1000	5.72	4.22	4.21
Main floor	16F2UE1000	5.72	4.94	4.91
bath gabel end	16F2UE1000	5.72	3.89	3.89
MWhdr-02	1800WG0040	5.74	6.12	6.12
MWhdr-03 copy	1800WG0040	5.74	6.11	6.11
FLOORS ABOVE BASEMENTS				
Foundation - 1	4231000660	0.00	0.72	0.72

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	64.75	64.75	7.84	2450.90	6.18
Main Walls	158.13	143.39	4.86	11713.42	29.54
Doors	3.37	1.96	0.52	1609.63	4.06
South Windows	0.56	0.56	0.51	472.01	1.19
Southeast Windows	2.75	2.75	0.59	1989.59	5.02
Northeast Windows	3.04	3.04	0.96	1366.79	3.45
North Windows	0.85	0.85	0.56	657.18	1.66
Northwest Windows	1.37	1.37	0.95	621.69	1.57
Southwest Windows	4.22	4.22	0.63	2860.38	7.21
ZONE 1 Totals:				23741.59	59.87

INTER-ZONE Heat Transfer : Floors Above Basement

Area m ² Gross	Area m ² Net	Effective (RSI)	Heat Loss MJ
38.74	38.74	0.721	2664.42

ZONE 2 : Basement

Component	Area m ² Gross	Area m ² Net	Effective (RSI)	Heat Loss MJ	% Annual Heat Loss
Walls above grade	19.46	19.16	-	2016.44	5.08
Southeast windows	0.20	0.20	0.75	102.33	0.26
Northwest windows	0.10	0.10	0.75	51.16	0.13
Basement floor header	6.99	6.99	6.12	557.13	1.40
Below grade foundation	73.77	73.77	-	3826.47	9.65
ZONE 2 Totals:				6553.53	16.53

Ventilation

House Volume368.54 m³**Air Change**

0.433 ACH

**Heat Loss
MJ**

9361.463

**% Annual
Heat Loss**

23.61

AIR LEAKAGE AND VENTILATION

Building Envelope Surface Area: 323.11 m²

Air Leakage Test Results at 50 Pa.(0.2 in H₂O) = 1.79 ACH

Equivalent Leakage Area @ 10 Pa = 228.38 cm²

Terrain Description	Height	m
@ Weather Station : Open flat terrain, grass	Anemometer	10.0
@ Building site : Suburban, forest	Bldg. Eaves	7.9

Local Shielding:	Walls:	Heavy
	Flue :	Light

Leakage Fractions-	Ceiling: 0.200	Walls: 0.650	Floors: 0.150
Normalized Leakage Area @ 10 Pa:	0.7068 cm ² /m ²		
Estimated Airflow to cause a 5 Pa Pressure Difference:	37 L/s		
Estimated Airflow to cause a 10 Pa Pressure Difference:	57 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
Other	2 rooms @ 5.0 L/s: 10.0 L/s
Basement Rooms	: 0.0 L/s

CENTRAL VENTILATION SYSTEM

System Type:	HVI Certified HRV
Manufacturer:	Carrier
Model Number:	ERVCLHA1150

Fan and Preheater Power at 0.0 °C:	160 Watts
Fan and Preheater Power at -25.0 °C:	160 Watts
Preheater Capacity:	0 Watts
Sensible Heat Recovery Efficiency at 0.0 °C	60%
Sensible Heat Recovery Efficiency at -25.0 °C	49%
Total Heat Recovery Efficiency in Cooling Mode	56%

Low Temperature Ventilation Reduction:	0%
Low Temperature Ventilation Reduction: Airflow Adjustment	0 L/s (0.0%)

NO Vented combustion appliance specified

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 (0.59 ACH)
Central Ventilation Supply Rate (): 35.396 L/s (0.35 ACH)
Total house ventilation is Balanced
Gross Air Leakage and Ventilation Energy Load: 23818.936 MJ
Seasonal Heat Recovery Ventilator Efficiency: 59.129 %
Estimated Ventilation Electrical Load: Heating Hours: 4426.480 MJ
Estimated Ventilation Electrical Load: Non-Heating Hours: 619.280 MJ
Net Air Leakage and Ventilation Load: 11574.703 MJ

SPACE HEATING SYSTEM

Primary Space Heating Fuel:	Electricity
Space Heating Equipment:	Ground Source Heat Pump
Manufacturer:	NextEnergy/ClimateMaster
Model:	TTV026AGC01ALKS
Input Capacity at 8.3 °C:	5.80 kW
Adjusted Capacity at 0.0 °C:	5.80 kW
Input COP at 8.3 °C:	3.84
Adjusted COP at 0.0 °C:	3.84
Crankcase Heater Power:	0.00 watts
Heat Pump Temperature Cut-Off:	Balance point

Ground or Water Source Heat Pump Temperatures

Month	Temperature (°C)	Month	Temperature (°C)
January	9.6	July	10.7
February	9.4	August	10.9
March	9.4	September	10.9
April	9.6	October	10.7
May	10.0	November	10.3
June	10.4	December	9.9

SPACE HEATING SYSTEM

Secondary Heating Fuel:	Natural Gas
Equipment:	Condensing furnace/boiler
Manufacturer:	Viessmann Vitodens 100
Model:	WB1B-26
Specified Output Capacity:	26.67 kW
AFUE:	95.20
Steady State Efficiency:	95.20
Fan Mode:	Auto
ECM Motor:	Yes
Low Speed Fan Power:	0 watts
High Speed Fan Power:	319 watts

AIR CONDITIONING SYSTEM

System Type:	Conventional A/C		
Manufacturer:			
Model:			
Capacity:	4114 Watts	Rated COP	4.303
SEER	25.00	Fan Power (watts)	177.72
Sensible Heat Ratio:	0.76	Crankcase Heater Power (watts):	0.00
Indoor Fan Flow Rate:	229.32 L/s		
Ventilator Flow Rate:	0.00 L/s		
Fraction of windows Openable	0.000		
Economizer control:	N/A	Indoor Fan Operation:	Auto

Air Conditioner is integrated with the Heating System

DOMESTIC WATER HEATING SYSTEM

Primary Water Heating Fuel:	Natural gas	
Water Heating Equipment:	Instantaneous (condensing)	
Energy Factor:	0.940	
Manufacturer:	Navien	
Model:	NR-180A	
Pilot Energy =	0.00 MJ/day	Flue Diameter 0.00 mm

ANNUAL DOMESTIC WATER HEATING SUMMARY

Daily Hot Water Consumption:	225.00 Litres
Hot Water Temperature:	48.89 °C
Estimated Domestic Water Heating Load:	15161 MJ
Primary Domestic Water Heating Energy Consumption:	15730.51 MJ
Primary System Seasonal Efficiency:	96.38%

ANNUAL SPACE HEATING SUMMARY

Design Heat Loss at -22.00 °C (12.89 Watts / m3):	4750.74 Watts
Gross Space Heat Loss:	39656.58 MJ
Gross Space Heating Load:	38151.60 MJ
Usable Internal Gains:	14580.61 MJ
Usable Internal Gains Fraction:	36.77 %
Usable Solar Gains:	8885.68 MJ
Usable Solar Gains Fraction:	22.41 %
Auxiliary Energy Required:	14685.32 MJ
Space Heating System Load:	14685.29 MJ
Heat Pump and Furnace Annual COP:	2.984
Heat Pump Annual Energy Consumption:	4086.77 MJ
Furnace/Boiler Annual Energy Consumption:	101.49 MJ
Annual Space Heating Energy Consumption:	4188.26 MJ

ANNUAL SPACE COOLING SUMMARY

Design Cooling Load for July at 31.00 °C:	4502.68 Watts
Design Sensible Heat Ratio:	0.769
Estimated Annual Space Cooling Energy:	938.24
Seasonal COP (May to October):	4.458

BASE LOADS SUMMARY

	kwh/day	Annual kWh
Interior Lighting	0.85	310.25
Appliances	7.00	2555.00
Other	7.60	2774.00
Exterior Use	4.00	1460.00
HVAC Fans		
HRV/Exhaust	3.84	1401.60
Space Heating	0.56	203.65
Space Cooling	0.41	147.97
Total Average Electrical Load	24.25	8852.47

FAN OPERATION SUMMARY (kWh)

Hours	HRV/Exhaust Fans	Space Heating	Space Cooling
Heating	1229.6	203.6	0.0
Neither	0.0	0.0	0.0
Cooling	172.0	0.0	148.0
Total	1401.6	203.6	148.0

ENERGY CONSUMPTION SUMMARY REPORT

Estimated Annual Space Heating Energy Consumption	= 4921.38 MJ	= 1367.05 kWh
Ventilator Electrical Consumption: Heating Hours	= 4426.48 MJ	= 1229.58 kWh
Estimated Annual DHW Heating Energy Consumption	= 15730.51 MJ	= 4369.59 kWh
ESTIMATED ANNUAL SPACE + DHW ENERGY CONSUMPTION	= 25078.37 MJ	= 6966.21 kWh
Estimated Greenhouse Gas Emissions	6.547 tonnes/year	

ESTIMATED ANNUAL FUEL CONSUMPTION SUMMARY

Fuel	Space Heating	Space Cooling	DHW Heating	Appliance	Total
Natural Gas (m3)	2.72	0.00	422.19	0.00	424.92
Electricity (kWh)	2568.44	938.24	0.00	7099.25	10605.92

ESTIMATED ANNUAL FUEL CONSUMPTION COSTS

Fuel Costs Library = Embedded

RATE	Electricity (Egeneric)	Natural Gas (NGgeneri)	Oil (Ogeneric)	Propane (Pgeneric)	Wood (Wgeneric)	Total
\$	1286.65	431.21	0.00	0.00	0.00	1717.87

Fuel Costs Library Listing

Filename = Embedded

Record # 1	Fuel: Electricity		
Rate ID =	ontario		
Egeneric	average		
Rate Block		Dollars	Charge
	kWhr	Per kWhr	(\$)
Minimum	0.0		10.000
1	99999.0	0.1100	
Record # 2	Fuel: Natural Gas		
Rate ID =	any gas LDC		
NGgeneri			
Rate Block		Dollars	Charge
	m3	Per m3	(\$)
Minimum	0.0		20.000
1	99999.0	0.4500	

Record # 3 Fuel: OilRate ID =
Ogeneric generic

Rate Block		Dollars	Charge
	Litre	Per Litre	(\$)
Minimum	0.0		10.000
1	99999.0	0.8000	

Record # 4 Fuel:
PropaneRate ID =
Pgeneric who has a
better
number?

Rate Block		Dollars	Charge
	Litre	Per Litre	(\$)
Minimum	0.0		0.000
1	99999.0	0.9500	

Record # 5 Fuel: WoodRate ID =
Wgeneric Put your
comments
here

Rate Block		Dollars	Charge
	Cord	Per Cord	(\$)
Minimum	0.0		0.000
1	5.0	300.0000	

MONTHLY ENERGY PROFILE

Month	Energy Load (MJ)	Internal Gains (MJ)	Solar Gains (MJ)	Aux. Energy (MJ)	HRV Eff. %
Jan	7264.9	1815.8	1186.8	4262.3	58.4
Feb	6244.6	1634.3	1431.4	3178.9	58.6
Mar	5466.3	1815.8	1785.4	1865.0	59.1
Apr	3461.2	1774.0	1457.8	229.4	59.2
May	1521.3	1245.0	276.3	0.0	59.4
Jun	323.5	323.5	0.0	0.0	59.5
Jul	0.0	0.0	0.0	0.0	59.6
Aug	0.0	0.0	0.0	0.0	59.7
Sep	839.1	790.7	48.4	0.0	59.5
Oct	2509.0	1550.6	958.3	0.0	59.2
Nov	4308.2	1797.5	811.1	1699.6	59.1
Dec	6213.5	1833.4	930.0	3450.1	58.9
Ann	38151.6	14580.6	8885.7	14685.3	59.1

FOUNDATION ENERGY PROFILE

Month	Heat Loss (MJ)				Total
	Crawl Space	Slab	Basement	Walkout	
Jan	0.0	0.0	370.7	0.0	370.7
Feb	0.0	0.0	276.4	0.0	276.4
Mar	0.0	0.0	162.2	0.0	162.2
Apr	0.0	0.0	20.0	0.0	20.0
May	0.0	0.0	0.0	0.0	0.0
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	0.0	0.0	0.0
Oct	0.0	0.0	0.0	0.0	0.0
Nov	0.0	0.0	147.7	0.0	147.7
Dec	0.0	0.0	300.0	0.0	300.0
Ann	0.0	0.0	1277.0	0.0	1277.0

FOUNDATION TEMPERATURES & VENTILATION PROFILE

Month	Temperature (Deg °C)			Air Change Rate		Heat Loss (MJ)
	Crawl Space	Basement	Walkout	Natural	Total	
Jan	0.0	18.9	0.0	0.125	0.482	2159.7
Feb	0.0	18.5	0.0	0.119	0.477	1816.6
Mar	0.0	18.3	0.0	0.106	0.464	1477.0
Apr	0.0	18.5	0.0	0.086	0.444	796.8
May	0.0	19.8	0.0	0.058	0.415	245.1
Jun	0.0	21.2	0.0	0.040	0.397	-83.7
Jul	0.0	22.5	0.0	0.032	0.390	-228.7

Aug	0.0	22.2	0.0	0.030	0.388	-195.6
Sep	0.0	21.1	0.0	0.045	0.403	59.1
Oct	0.0	19.7	0.0	0.068	0.426	548.6
Nov	0.0	19.4	0.0	0.091	0.449	1045.9
Dec	0.0	19.1	0.0	0.111	0.468	1720.8
Ann	0.0	20.0	0.0	0.076	0.433	9361.5

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	4262.3	32.9	0.0	213.2	1172.3	1418.5	3.0
Feb	3178.9	19.1	0.0	159.9	885.4	1064.4	3.0
Mar	1865.0	14.2	0.0	93.7	528.4	636.3	2.9
Apr	229.4	3.3	0.0	11.4	66.0	80.7	2.8
May	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov	1699.6	11.7	0.0	83.6	478.2	573.4	3.0
Dec	3450.1	20.2	0.0	171.4	956.5	1148.1	3.0
Ann	14685.3	101.5	0.0	733.1	4086.8	4921.4	3.0

AIR CONDITIONING SYSTEM PERFORMANCE

Month	Sensible Load MJ	Latent Load MJ	AirCond Energy kWh	Fan Energy kWh	Ventilator Energy kWh	Total Energy kWh	COP	Av.RH %
May	1012.1	148.9	60.8	14.6	0.0	75.4	4.3	32.5
Jun	2028.7	482.2	126.3	30.2	0.0	156.6	4.5	38.6
Jul	2795.9	844.8	178.9	42.8	0.0	221.8	4.6	41.9
Aug	2428.9	780.6	159.3	38.1	0.0	197.5	4.5	42.7
Sep	1255.2	328.9	81.7	19.5	0.0	101.2	4.3	39.2
Oct	157.9	31.6	11.1	2.7	0.0	13.8	3.8	35.0
Ann	9678.7	2616.9	618.2	148.0	0.0	766.2	4.5	39.1

MONTHLY ESTIMATED ENERGY CONSUMPTION BY DEVICE (MJ)

Month	Space Heating		DHW Heating		Lights & Appliances	HRV & FANS	Air Conditioner
	Primary	Secondary	Primary	Secondary			

Jan	1172.3	32.9	1474.1	0.0	2170.6	641.7	0.0
Feb	885.4	19.1	1350.6	0.0	1960.6	547.0	0.0
Mar	528.4	14.2	1474.1	0.0	2170.6	522.2	0.0
Apr	66.0	3.3	1370.4	0.0	2100.6	426.1	0.0
May	0.0	0.0	1336.9	0.0	2170.6	481.0	219.0
Jun	0.0	0.0	1217.2	0.0	2100.6	523.6	454.8
Jul	0.0	0.0	1199.8	0.0	2170.6	582.7	644.2
Aug	0.0	0.0	1178.6	0.0	2170.6	565.8	573.6
Sep	0.0	0.0	1161.1	0.0	2100.6	485.1	294.0
Oct	0.0	0.0	1257.8	0.0	2170.6	438.1	40.1
Nov	478.2	11.7	1293.8	0.0	2100.6	498.3	0.0
Dec	956.5	20.2	1416.1	0.0	2170.6	599.9	0.0
Ann	4086.8	101.5	15730.5	0.0	25557.3	6311.6	2225.7

ESTIMATED FUEL COSTS (Dollars)

Month	Electricity	Natural Gas	Oil	Propane	Wood	Total
Jan	131.75	38.20	0.00	0.00	0.00	169.96
Feb	113.67	36.54	0.00	0.00	0.00	150.22
Mar	108.43	37.98	0.00	0.00	0.00	146.40
Apr	89.22	36.59	0.00	0.00	0.00	125.81
May	97.71	36.15	0.00	0.00	0.00	133.86
Jun	104.08	34.70	0.00	0.00	0.00	138.78
Jul	113.81	34.49	0.00	0.00	0.00	148.30
Aug	111.14	34.23	0.00	0.00	0.00	145.37
Sep	97.99	34.02	0.00	0.00	0.00	132.01
Oct	90.94	35.19	0.00	0.00	0.00	126.13
Nov	104.02	35.77	0.00	0.00	0.00	139.79
Dec	123.88	37.35	0.00	0.00	0.00	161.23
Ann	1286.65	431.21	0.00	0.00	0.00	1717.87

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.