



Building Analysis Entire House Gravenhurst Plumbing, Heating & Electric

Job: 2011-____
Date: May 17 2011
By: Chip Loughead

Cert.#: 001388(RHLG, RASD)
210 Brock Street, Gravenhurst, On P1P1H4 Phone: 705.687.3402 Fax: 705.687.7945 Email: chip@gravenhurstplumbing.com Web: www.gravenhurstplumbing.com License: BCIN ...

Project Information

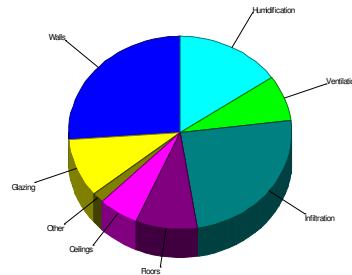
For: Your Customer's Name, Your Company Name
Customer's address, On

Design Conditions

Location: Muskoka AP, ON, CA Elevation: 925 ft Latitude: 45°N		Indoor: Indoor temperature (°F) 72 Design TD (°F) 87 Relative humidity (%) 30 Moisture difference (gr/lb) 33.0		Heating 72	Cooling 75
Outdoor: Dry bulb (°F) Daily range (°F) Wet bulb (°F) Wind speed (mph)	Heating -15 - - 15.0	Cooling 84 23 (M) 71 7.5	Infiltration: Method F280 Exposure category Partially sheltered Construction category Very-tight Number of stories 1.0		

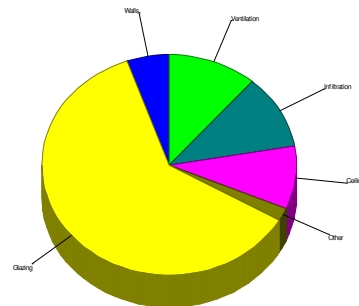
Heating

Component	Btuh/ft²	Btuh	% of load
Walls	1.5	10896	26.1
Glazing	31.3	4053	9.7
Doors	11.8	743	1.8
Ceilings	2.2	2458	5.9
Floors	3.3	3719	8.9
Infiltration	53.3	10265	24.6
Ducts		0	0
Hydronic		0	0
Humidification		6370	15.3
Ventilation		3204	7.7
Adjustments		0	
Total		41706	100.0



Cooling

Component	Btuh/ft²	Btuh	% of load
Walls	0.1	508	5.4
Glazing	44.6	5774	61.3
Doors	0.6	37	0.4
Ceilings	0.8	875	9.3
Floors	0	0	0
Infiltration	5.3	1026	10.9
Ducts		0	0
Ventilation		1069	11.3
Internal gains		0	0
Blower		137	1.4
Adjustments		0	
Total		9426	100.0



Latent Cooling Load = 2787 Btuh
Overall U-value = 0.021 Btuh/ft²·°F

Data entries checked.

Calculations approved by HRAI to meet all requirements of CAN/CSA-F280-M90



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Notes: South exposure, R40 ceilings and R30 cathedral, R3 windows, R10 Doors, R25 walls, r10 slab, R20 basement walls full, HRV assumed, BCIN 27678

Design Information

Weather: Muskoka AP, ON, CA

Winter Design Conditions

Outside db	-15 °F
Inside db	72 °F
Design TD	87 °F

Summer Design Conditions

Outside db	84 °F
Inside db	75 °F
Design TD	9 °F
Daily range	M
Relative humidity	50 %
Moisture difference	27 gr/lb

Heating Summary

Structure	35336 Btuh
Ducts	0 Btuh
Central vent (0 cfm)	0 Btuh
Humidification	6370 Btuh
Piping	0 Btuh
Equipment load	41706 Btuh

Sensible Cooling Equipment Load Sizing

Structure	9289 Btuh
Ducts	0 Btuh
Central vent (0 cfm)	0 Btuh
Blower	137 Btuh
Use manufacturer's data	y
Rate/swing multiplier	1.00
Equipment sensible load	9426 Btuh

Infiltration

Method	F280	
Exposure category	Partially sheltered	
Construction category	Very-tight	
Number of stories	1.0	
	Heating	Cooling
Area (ft²)	2233	2233
Volume (ft³)	20097	20097
Air changes/hour	0.33	0.32
Equiv. AVF (cfm)	109	106

Latent Cooling Equipment Load Sizing

Structure	2787 Btuh
Ducts	0 Btuh
Central vent (0 cfm)	0 Btuh
Equipment latent load	2787 Btuh
Equipment total load	12213 Btuh
Req. total capacity at 0.70 SHR	1.1 ton

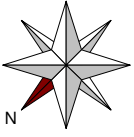
Heating Equipment Summary

Make	Frigidaire
Trade	FRIGIDAIRE
Model	FG7MQ 060*-VB
AHRI ref no.	2029310
Efficiency	97 AFUE
Heating input	60000 Btuh
Heating output	58000 Btuh
Temperature rise	50 °F
Actual air flow	1074 cfm
Air flow factor	0.030 cfm/Btuh
Static pressure	0.50 in H2O
Space thermostat	

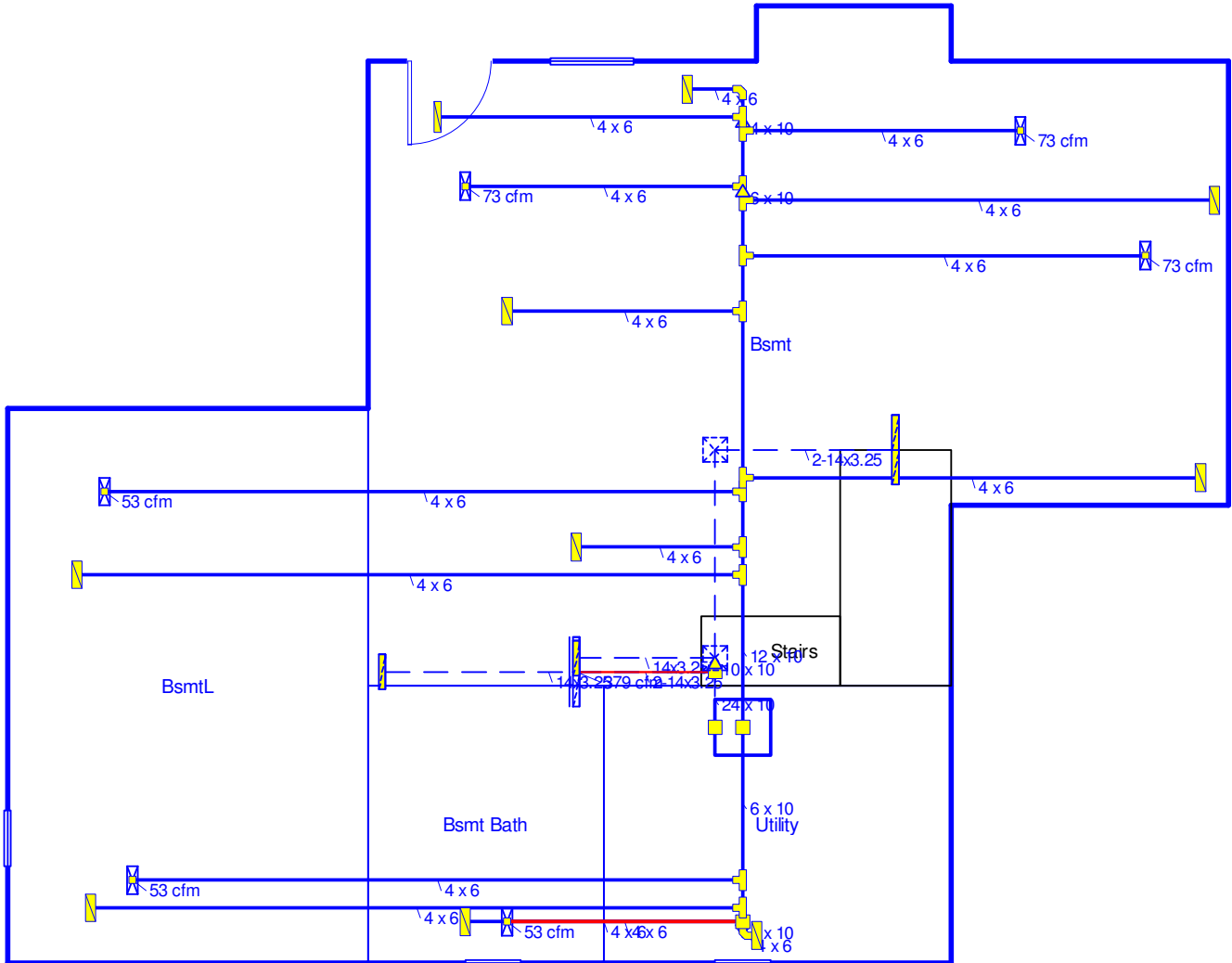
Cooling Equipment Summary

Make	Frigidaire
Trade	FRIGIDAIRE FS4BD SERIES
Cond	FS4BD-018KA
Coil	C6B(A,H)-F24(C,U)-A+FG7T(*)-A+TXV-X2.0
AHRI ref no.	3352598
Efficiency	13.1 EER, 14 SEER
Sensible cooling	12600 Btuh
Latent cooling	5400 Btuh
Total cooling	18000 Btuh
Actual air flow	600 cfm
Air flow factor	0.065 cfm/Btuh
Static pressure	0.50 in H2O
Load sensible heat ratio	0.77

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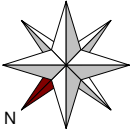
Basement



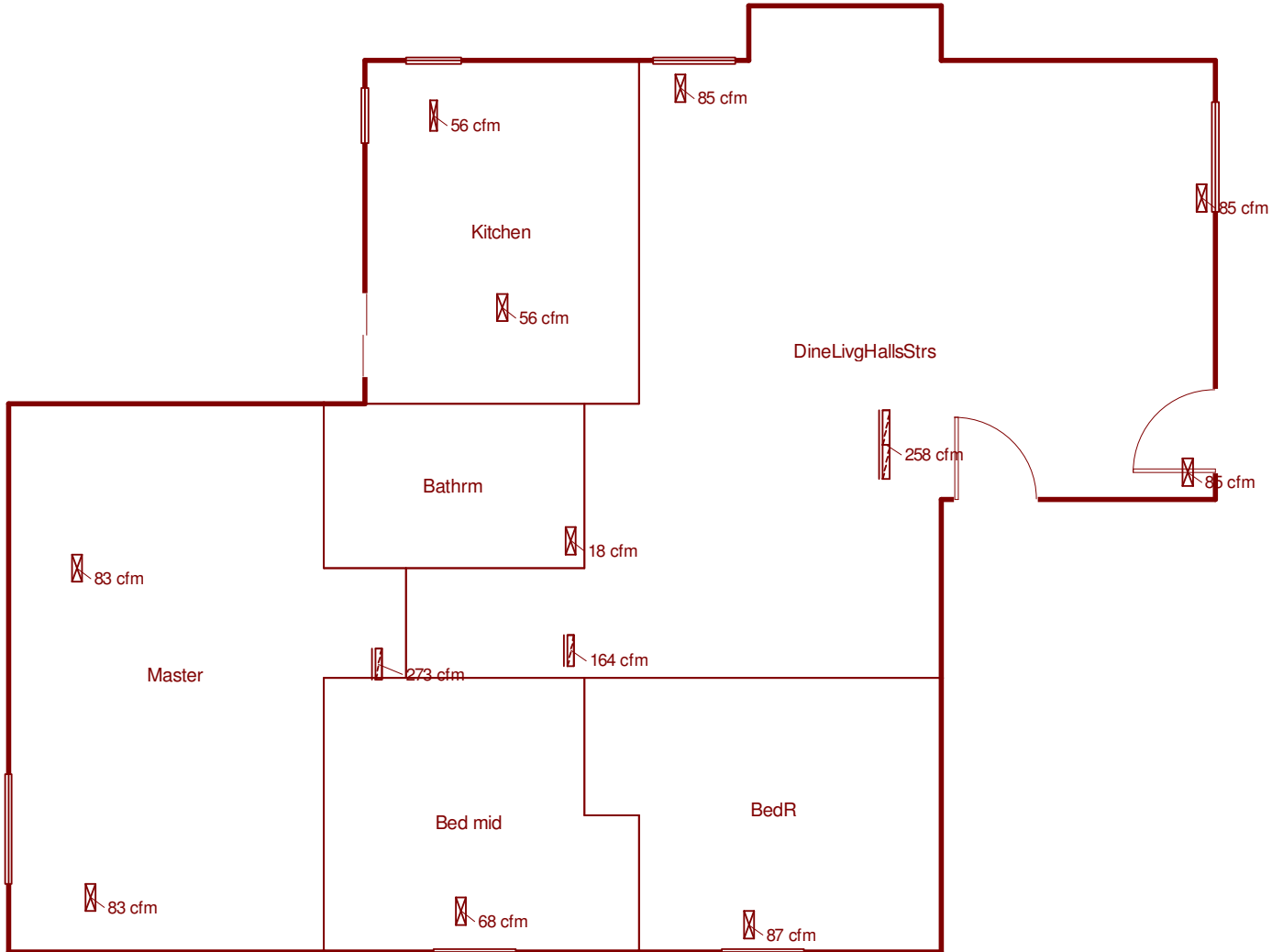
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Main level



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Duct System Summary

Entire House

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	Heating	Cooling
External static pressure	0.50 in H2O	0.50 in H2O
Pressure losses	0.24 in H2O	0.24 in H2O
Available static pressure	0.26 in H2O	0.26 in H2O
Supply / return available pressure	0.16 / 0.10 in H2O	0.16 / 0.10 in H2O
Lowest friction rate	0.112 in/100ft	0.112 in/100ft
Actual air flow	1074 cfm	600 cfm
Total effective length (TEL)		232 ft

Supply Branch Detail Table

Name	Design (Btuh)	Htg (cfm)	Clg (cfm)	Design FR	Diam (in)	H x W (in)	Duct Matl	Actual Ln (ft)	Ftg.Eqv Ln (ft)	Trunk
Bathrm	h 593	18	10	0.139	2.9	6x 4	ShMt	12.5	100.0	st2
Bed mid	c 1050	63	68	0.233	4.2	6x 4	ShMt	17.0	50.0	st1
BedR	h 2876	87	71	0.230	4.7	6x 4	ShMt	8.0	60.0	st1A
Bsmt	h 2408	73	11	0.171	4.7	6x 4	ShMt	31.5	60.0	st2
Bsmt Bath	h 1753	53	23	0.282	3.7	6x 4	ShMt	15.5	40.0	st1
Bsmt-A	h 2408	73	11	0.165	4.7	6x 4	ShMt	29.5	65.0	st2A
Bsmt-B	h 2408	73	11	0.181	4.6	6x 4	ShMt	31.5	55.0	st2A
BsmtL	h 1743	53	10	0.160	4.2	6x 4	ShMt	27.5	70.0	st1
BsmtL-A	h 1743	53	10	0.129	4.4	6x 4	ShMt	31.5	90.0	st2
DineLivgHallsStrs	h 2799	85	53	0.182	4.9	6x 4	ShMt	36.0	50.0	st2
DineLivgHallsStrs-A	h 2799	85	53	0.148	5.1	6x 4	ShMt	25.5	80.0	st2
DineLivgHallsStrs-B	h 2799	85	53	0.195	4.8	6x 4	ShMt	25.0	55.0	st2B
Kitchen	c 865	53	56	0.167	4.2	6x 4	ShMt	23.5	70.0	st2
Kitchen-A	c 865	53	56	0.152	4.3	6x 4	ShMt	33.0	70.0	st2B
Master	h 2732	83	53	0.174	4.9	6x 4	ShMt	30.0	60.0	st1
Master-A	h 2732	83	53	0.112	5.3	6x 4	ShMt	29.5	110.0	st2

Calculations approved by HRAI to meet all requirements of CAN/CSA-F280-M90

Supply Trunk Detail Table

Name	Trunk Type	Htg (cfm)	Clg (cfm)	Design FR	Veloc (fpm)	Diam (in)	H x W (in)	Duct Material	Trunk
st1A	Peak AVF	87	71	0.230	315	4.7	10 x 4	ShtMetl	st1
st1	Peak AVF	340	225	0.160	816	8.4	10 x 6	ShtMetl	
st2	Peak AVF	734	375	0.112	881	12.0	10 x 12	ShtMetl	st2 st2A
st2A	Peak AVF	284	130	0.152	682	7.9	10 x 6	ShtMetl	
st2B	Peak AVF	138	109	0.152	495	6.0	10 x 4	ShtMetl	

Return Branch Detail Table

Name	Grill Size (in)	Htg (cfm)	Clg (cfm)	TEL (ft)	Design FR	Veloc (fpm)	Diam (in)	H x W (in)	Stud/Joist Opening (in)	Duct Matl	Trunk
rb1	24x7	379	75	52.0	0.199	599	8.3	2-14x3.25	2-10x18	SJSp	rt1
rb2	16x5	164	130	92.5	0.112	521	6.9	14x3.25	10x9	SJSp	rt1A
rb3	16x8	273	217	34.0	0.305	865	6.8	14x3.25	10x9	SJSp	rt1
rb4	16x7	258	177	86.5	0.120	408	8.0	2-14x3.25	2-10x18	SJSp	rt1A

Return Trunk Detail Table

Name	Trunk Type	Htg (cfm)	Clg (cfm)	Design FR	Veloc (fpm)	Diam (in)	H x W (in)	Duct Material	Trunk
rt1A	Peak AVF	422	307	0.112	608	9.7	10 x 10	ShtMetl	rt1
rt1	Peak AVF	1074	600	0.112	644	13.8	10 x 24	ShtMetl	

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