

Project Information

For:

Notes:

Design Information

Weather: Norwood Mem, MA, US

Winter Design Conditions

Outside db 9 °F
 Inside db 70 °F
 Design TD 61 °F

Summer Design Conditions

Outside db 88 °F
 Inside db 75 °F
 Design TD 13 °F
 Daily range M
 Relative humidity 50 %
 Moisture difference 31 gr/lb

Heating Summary

Structure 50820 Btuh
 Ducts 5786 Btuh
 Central vent (0 cfm) 0 Btuh
 Humidification 10024 Btuh
 Piping 0 Btuh
 Equipment load 66629 Btuh

Sensible Cooling Equipment Load Sizing

Structure 21322 Btuh
 Ducts 3568 Btuh
 Central vent (0 cfm) 0 Btuh
 Blower 0 Btuh
 Use manufacturer's data y
 Rate/swing multiplier 1.00
 Equipment sensible load 24890 Btuh

Infiltration

Method Simplified
 Construction quality Loose
 Fireplaces 1 (Loose)

Latent Cooling Equipment Load Sizing

Structure 4031 Btuh
 Ducts 986 Btuh
 Central vent (0 cfm) 0 Btuh
 Equipment latent load 5017 Btuh

	Heating	Cooling
Area (ft²)	2434	2434
Volume (ft³)	19472	19472
Air changes/hour	0.95	0.44
Equiv. AVF (cfm)	309	143

Equipment Total Load (Sen+Lat) 29907 Btuh
 Req. total capacity at 0.70 SHR 3.0 ton

Heating Equipment Summary

Make n/a
 Trade n/a
 Model n/a
 AHRI ref. n/a
 Efficiency n/a
 Heating input 0 Btuh
 Heating output 0 °F
 Temperature rise 0 cfm
 Actual air flow 0 cfm/Btuh
 Air flow factor 0 in H2O
 Static pressure n/a
 Space thermostat n/a

Cooling Equipment Summary

Make n/a
 Trade n/a
 Cond n/a
 Coil n/a
 AHRI ref. n/a
 Efficiency n/a
 Sensible cooling 0 Btuh
 Latent cooling 0 Btuh
 Total cooling 0 Btuh
 Actual air flow 0 cfm
 Air flow factor 0 cfm/Btuh
 Static pressure 0 in H2O
 Load sensible heat ratio 0

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.

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Winter Design Conditions

Outside db	9 °F
Inside db	70 °F
Design TD	61 °F

Summer Design Conditions

Outside db	88 °F
Inside db	75 °F
Design TD	13 °F
Daily range	M
Relative humidity	50 %
Moisture difference	31 gr/lb

Heating Summary

Structure	30950 Btuh
Ducts	2524 Btuh
Central vent (0 cfm) (none)	0 Btuh
Humidification	5253 Btuh
Piping	0 Btuh
Equipment load	38728 Btuh

Sensible Cooling Equipment Load Sizing

Structure	13804 Btuh
Ducts	989 Btuh
Central vent (0 cfm) (none)	0 Btuh
Blower	0 Btuh
Use manufacturer's data	y
Rate/swing multiplier	1.00
Equipment sensible load	14793 Btuh

Infiltration

Method	Simplified
Construction quality	Loose
Fireplaces	1 (Loose)

Latent Cooling Equipment Load Sizing

Structure	2589 Btuh
Ducts	597 Btuh
Central vent (0 cfm) (none)	0 Btuh
Equipment latent load	3186 Btuh

	Heating	Cooling
Area (ft ²)	1301	1301
Volume (ft ³)	10408	10408
Air changes/hour	0.93	0.43
Equiv. AVF (cfm)	162	75

Equipment Total Load (Sen+Lat)	17979 Btuh
Req. total capacity at 0.70 SHR	1.8 ton

Heating Equipment Summary

Make	
Trade	
Model	
AHRI ref	
Efficiency	80 AFUE
Heating input	0 Btuh
Heating output	0 Btuh
Temperature rise	0 °F
Actual air flow	701 cfm
Air flow factor	0.021 cfm/Btuh
Static pressure	0 in H2O
Space thermostat	

Cooling Equipment Summary

Make	
Trade	
Cond	
Coil	
AHRI ref	
Efficiency	0 SEER
Sensible cooling	0 Btuh
Latent cooling	0 Btuh
Total cooling	0 Btuh
Actual air flow	701 cfm
Air flow factor	0.047 cfm/Btuh
Static pressure	0 in H2O
Load sensible heat ratio	0.82

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Summer Design Conditions

Outside db 88 °F
Inside db 75 °F
Design TD 13 °F
Daily range M
Relative humidity 50 %
Moisture difference 31 gr/lb

Heating Summary

Structure 19869 Btuh
Ducts 3262 Btuh
Central vent (0 cfm)
(none) 0 Btuh
Humidification 4770 Btuh
Piping 0 Btuh
Equipment load 27902 Btuh

Infiltration

Method Simplified
Construction quality Loose
Fireplaces 1 (Loose)

	Heating	Cooling
Area (ft ²)	1133	1133
Volume (ft ³)	9064	9064
Air changes/hour	0.97	0.45
Equiv. AVF (cfm)	147	68

Heating Equipment Summary

Make
Trade
Model
AHRI ref
Efficiency 80 AFUE
Heating input 0 Btuh
Heating output 0 Btuh
Temperature rise 0 °F
Actual air flow 421 cfm
Air flow factor 0.018 cfm/Btuh
Static pressure 0 in H2O
Space thermostat

Sensible Cooling Equipment Load Sizing

Structure 7518 Btuh
Ducts 2579 Btuh
Central vent (0 cfm)
(none) 0 Btuh
Blower 0 Btuh
Use manufacturer's data y
Rate/swing multiplier 1.00
Equipment sensible load 10097 Btuh

Latent Cooling Equipment Load Sizing

Structure 1443 Btuh
Ducts 389 Btuh
Central vent (0 cfm)
(none) 0 Btuh
Equipment latent load 1831 Btuh

Equipment Total Load (Sen+Lat) 11928 Btuh
Req. total capacity at 0.70 SHR 1.2 ton

Cooling Equipment Summary

Make
Trade
Cond
Coil
AHRI ref
Efficiency 0 SEER
Sensible cooling 0 Btuh
Latent cooling 0 Btuh
Total cooling 0 Btuh
Actual air flow 421 cfm
Air flow factor 0.042 cfm/Btuh
Static pressure 0 in H2O
Load sensible heat ratio 0.85

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Design Information

	Htg	Clg		Infiltration	
Outside db (°F)	9	88	Method		Simplified
Inside db (°F)	70	75	Construction quality		Loose
Design TD (°F)	61	13	Fireplaces		1 (Loose)
Daily range	-	M			
Inside humidity (%)	50	50			
Moisture difference (gr/lb)	48	31			

HEATING EQUIPMENT

Make	n/a
Trade	n/a
Model	n/a
AHRI ref	n/a
Efficiency	n/a
Heating input	
Heating output	0 Btuh
Temperature rise	0 °F
Actual air flow	0 cfm
Air flow factor	0 cfm/Btuh
Static pressure	0 in H2O
Space thermostat	n/a

COOLING EQUIPMENT

Make	n/a
Trade	n/a
Cond	n/a
Coil	n/a
AHRI ref	n/a
Efficiency	n/a
Sensible cooling	0 Btuh
Latent cooling	0 Btuh
Total cooling	0 Btuh
Actual air flow	0 cfm
Air flow factor	0 cfm/Btuh
Static pressure	0 in H2O
Load sensible heat ratio	0

ROOM NAME	Area (ft²)	Htg load (Btuh)	Clg load (Btuh)	Htg AVF (cfm)	Clg AVF (cfm)
1st Floor	1301	33474	14793	701	701
2nd Floor	1133	23132	10097	421	421
Other equip loads	2434	56606	24890	1123	1123
Equip. @ 1.00 RSM		10024	0		
Latent cooling			24890		
			5017		
TOTALS	2434	66629	29907	1123	1123

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Design Information

	Htg	Clg		Infiltration	
Outside db (°F)	9	88	Method		Simplified
Inside db (°F)	70	75	Construction quality		Loose
Design TD (°F)	61	13	Fireplaces		1 (Loose)
Daily range	-	M			
Inside humidity (%)	50	50			
Moisture difference (gr/lb)	48	31			

HEATING EQUIPMENT

Make	
Trade	
Model	
AHRI ref	
Efficiency	80 AFUE
Heating input	0 Btuh
Heating output	0 Btuh
Temperature rise	0 °F
Actual air flow	701 cfm
Air flow factor	0.021 cfm/Btuh
Static pressure	0 in H2O
Space thermostat	

COOLING EQUIPMENT

Make	
Trade	
Cond	
Coil	
AHRI ref	
Efficiency	0 SEER
Sensible cooling	0 Btuh
Latent cooling	0 Btuh
Total cooling	0 Btuh
Actual air flow	701 cfm
Air flow factor	0.047 cfm/Btuh
Static pressure	0 in H2O
Load sensible heat ratio	0.82

ROOM NAME	Area (ft²)	Htg load (Btuh)	Clg load (Btuh)	Htg AVF (cfm)	Clg AVF (cfm)
Kitchen	375	9358	5449	196	258
Pantry	70	2200	369	46	17
Living	408	10389	5676	218	269
Foyer	187	2359	455	49	22
Mud	101	3942	1272	83	60
Bed 4	140	3955	1198	83	57
1/2 Bath	20	1272	373	27	18

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1st Floor	1301	33474	14793	701	701
Other equip loads		5253	0		
Equip. @ 1.00 RSM			14793		
Latent cooling			3186		
TOTALS	1301	38728	17979	701	701

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Design Information

	Htg	Clg	Infiltration	
Outside db (°F)	9	88	Method	Simplified
Inside db (°F)	70	75	Construction quality	Loose
Design TD (°F)	61	13	Fireplaces	1 (Loose)
Daily range	-	M		
Inside humidity (%)	50	50		
Moisture difference (gr/lb)	48	31		

HEATING EQUIPMENT

Make	
Trade	
Model	
AHRI ref	
Efficiency	80 AFUE
Heating input	0 Btuh
Heating output	0 Btuh
Temperature rise	0 °F
Actual air flow	421 cfm
Air flow factor	0.018 cfm/Btuh
Static pressure	0 in H2O
Space thermostat	

COOLING EQUIPMENT

Make	
Trade	
Cond	
Coil	
AHRI ref	
Efficiency	0 SEER
Sensible cooling	0 Btuh
Latent cooling	0 Btuh
Total cooling	0 Btuh
Actual air flow	421 cfm
Air flow factor	0.042 cfm/Btuh
Static pressure	0 in H2O
Load sensible heat ratio	0.85

ROOM NAME	Area (ft²)	Htg load (Btuh)	Clg load (Btuh)	Htg AVF (cfm)	Clg AVF (cfm)
Bed 2	225	5385	1774	98	74
Shared Bath	63	1183	1383	22	58
M. Bath	84	1853	1068	34	45
M W.I.C.	50	92	78	2	3
M. Bed	275	6448	2264	117	95
Bed 3 Bath	24	903	456	16	19
Bed 3	222	5584	1634	102	68
Hall/Laundry	190	1684	1440	31	60

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2nd Floor	1133	23132	10097	421	421
Other equip loads		4770	0		
Equip. @ 1.00 RSM			10097		
Latent cooling			1831		
TOTALS	1133	27902	11928	421	421

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Project Information

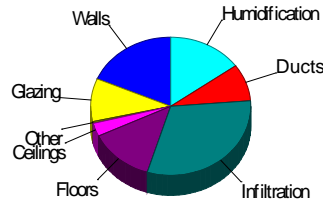
For:

Design Conditions

Location:		Indoor:		Heating	Cooling
Norwood Mem, MA, US		Indoor temperature (°F)		70	75
Elevation: 49 ft		Design TD (°F)		61	13
Latitude: 42°N		Relative humidity (%)		50	50
		Moisture difference (gr/lb)		47.8	31.3
Outdoor:	Heating	Cooling	Infiltration:		
Drybulb (°F)	9	88	Method	Simplified	
Daily range (°F)	-	21 (M)	Construction quality	Loose	
Wet bulb (°F)	-	73	Fireplaces	1 (Loose)	
Wind speed (mph)	15.0	7.5			

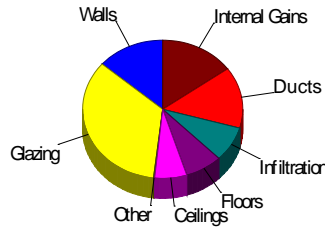
Heating

Component	Btuh/ft²	Btuh	% of load
Walls	5.2	12325	18.5
Glazing	23.4	6725	10.1
Doors	12.2	256	0.4
Ceilings	1.6	2080	3.1
Floors	6.7	8780	13.2
Infiltration	7.8	20653	31.0
Ducts		5786	8.7
Piping		0	0
Humidification		10024	15.0
Ventilation		0	0
Adjustments		0	0
Total		66629	100.0



Cooling

Component	Btuh/ft²	Btuh	% of load
Walls	1.4	3400	13.7
Glazing	29.8	8589	34.5
Doors	2.6	55	0.2
Ceilings	1.2	1616	6.5
Floors	1.4	1874	7.5
Infiltration	0.8	2038	8.2
Ducts		3568	14.3
Ventilation		0	0
Internal gains		3750	15.1
Blower		0	0
Adjustments		0	0
Total		24890	100.0



Latent Cooling Load = 5017 Btuh
Overall U-value = 0.140 Btuh/ft²·°F

Data entries checked.

Project Information

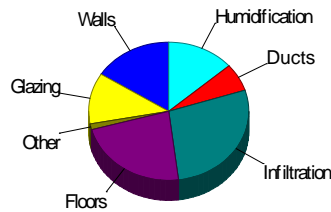
For:

Design Conditions

Location:		Indoor:		Heating	Cooling
Norwood Mem, MA, US		Indoor temperature (°F)		70	75
Elevation: 49 ft		Design TD (°F)		61	13
Latitude: 42°N		Relative humidity (%)		50	50
		Moisture difference (gr/lb)		47.8	31.3
Outdoor:	Heating	Cooling	Infiltration:		
Drybulb (°F)	9	88	Method	Simplified	
Daily range (°F)	-	21 (M)	Construction quality	Loose	
Wet bulb (°F)	-	73	Fireplaces	1 (Loose)	
Wind speed (mph)	15.0	7.5			

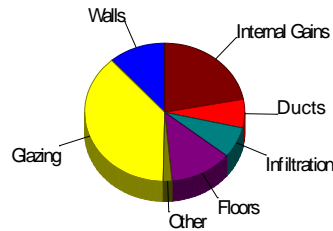
Heating

Component	Btuh/ft²	Btuh	% of load
Walls	5.2	6196	16.0
Glazing	24.6	4628	12.0
Doors	12.2	256	0.7
Ceilings	1.6	266	0.7
Floors	6.7	8780	22.7
Infiltration	7.8	10824	28.0
Ducts		2524	6.5
Piping		0	0
Humidification		5253	13.6
Ventilation		0	0
Adjustments		0	0
Total		38728	100.0



Cooling

Component	Btuh/ft²	Btuh	% of load
Walls	1.4	1709	11.6
Glazing	30.0	5641	38.1
Doors	2.6	55	0.4
Ceilings	1.2	207	1.4
Floors	1.4	1874	12.7
Infiltration	0.8	1068	7.2
Ducts		989	6.7
Ventilation		0	0
Internal gains		3250	22.0
Blower		0	0
Adjustments		0	0
Total		14793	100.0



Latent Cooling Load = 3186 Btuh
Overall U-value = 0.199 Btuh/ft²·°F

Data entries checked.

Project Information

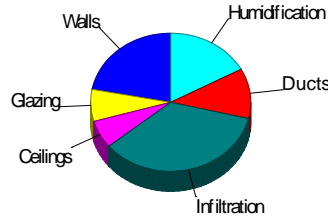
For:

Design Conditions

Location:		Indoor:		Heating	Cooling
Norwood Mem, MA, US		Indoor temperature (°F)		70	75
Elevation: 49 ft		Design TD (°F)		61	13
Latitude: 42°N		Relative humidity (%)		50	50
		Moisture difference (gr/lb)		47.8	31.3
Outdoor:	Heating	Cooling	Infiltration:		
Drybulb (°F)	9	88	Method	Simplified	
Daily range (°F)	-	21 (M)	Construction quality	Loose	
Wet bulb (°F)	-	73	Fireplaces	1 (Loose)	
Wind speed (mph)	15.0	7.5			

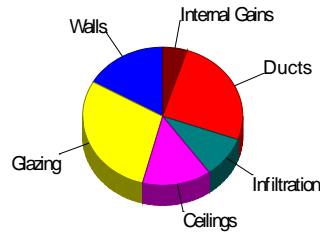
Heating

Component	Btuh/ft²	Btuh	% of load
Walls	5.2	6129	22.0
Glazing	21.0	2097	7.5
Doors	0	0	0
Ceilings	1.6	1814	6.5
Floors	0	0	0
Infiltration	7.8	9829	35.2
Ducts		3262	11.7
Piping		0	0
Humidification		4770	17.1
Ventilation		0	0
Adjustments		0	0
Total		27902	100.0



Cooling

Component	Btuh/ft²	Btuh	% of load
Walls	1.4	1691	16.7
Glazing	29.6	2948	29.2
Doors	0	0	0
Ceilings	1.3	1409	14.0
Floors	0	0	0
Infiltration	0.8	970	9.6
Ducts		2579	25.5
Ventilation		0	0
Internal gains		500	5.0
Blower		0	0
Adjustments		0	0
Total		10097	100.0



Latent Cooling Load = 1831 Btuh
Overall U-value = 0.069 Btuh/ft²·°F

Data entries checked.

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Design Conditions

Location:		Indoor:		Heating	Cooling
Norwood Mem, MA, US		Indoor temperature (°F)		70	75
Elevation: 49 ft		Design TD (°F)		61	13
Latitude: 42°N		Relative humidity (%)		50	50
		Moisture difference (gr/lb)		47.8	31.3
Outdoor:	Heating	Cooling	Infiltration:		
Dry bulb (°F)	9	88	Method	Simplified	
Daily range (°F)	-	21 (M)	Construction quality	Loose	
Wet bulb (°F)	-	73	Fireplaces	1 (Loose)	
Wind speed (mph)	15.0	7.5			

Construction descriptions

	Or	Area	U-value	Ins ul R	Htg HTM	Loss Clg HTM	Gain	
		ft²	Btuh/ft²-°F	ft²-°F/Btuh	Btuh/ft²	Btuh	Btuh/ft²	
Walls								
12D-0sw : Frm w all, w d ext, 3/8" w ood shth, r-15 cav ins, 1/2" gyps urme		574	0.086	15.0	5.24	3008	1.44	830
board int fnsh, 2"x4" w ood frm, 16" o.c. stud	se	623	0.086	15.0	5.24	3265	1.44	901
	sw	534	0.086	15.0	5.24	2798	1.44	772
	nw	621	0.086	15.0	5.24	3254	1.44	898
	all	2353	0.086	15.0	5.24	12325	1.44	3400

Partitions
(none)

Windows

Double Non-Metal 2015 IECC: Dbl Non-Metal Default; 50% blinds 45°, medium; 6.67 ft head ht	ne	20	0.550	0	33.5	673	27.9	560
U30 S30: MA minimum; 50% blinds 45°, medium; 50% outdoor insect screen; 6.67 ft head ht	ne	30	0.300	0	18.3	541	17.6	521
	se	38	0.300	0	18.3	693	22.2	844
	sw	53	0.300	0	18.3	970	22.2	1180
	nw	42	0.300	0	18.3	767	17.6	738
	nw	41	0.300	0	18.3	745	17.6	718
	all	203	0.300	0	18.3	3715	19.7	4001
Double Non-Metal 2015 IECC: Dbl Non-Metal Default; 50% blinds 45°, medium; 100% indoor insect screen; 6.67 ft head ht	se	22	0.550	0	33.5	723	45.5	983
Double Non-Metal 2015 IECC: Dbl Non-Metal Default; 50% blinds 45°, medium; 50% outdoor insect screen; 6.67 ft head ht	sw	37	0.550	0	33.5	1229	45.5	1671
Skylight Double Non-Metal 2015 IECC: Skylight Dbl Non-Mtl Default	nw	6	1.050	0	63.9	384	153	919

Doors

Wood Door w Storm 2015 IECC: Wood Door Default w Storm	se	21	0.200	5.0	12.2	256	2.62	55
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Ceilings

16B-30ad: A ttic ceiling, asphalt shingles roof mat, r-30 ceil ins, 1/2" gypsum board int fnsh		81	0.032	30.0	1.95	158	1.51	123
16B-38ad: A ttic ceiling, asphalt shingles roof mat, r-38 ceil ins, 1/2" gypsum board int fnsh		1214	0.026	38.0	1.58	1922	1.23	1493

Floors

19A-0bvhp: Flr floor, frm flr, 10" thkns, hrd w d flr fnsh, leaky bsmt ovr 1301 0.295 0 6.75 8780 1.44 1874

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Location:		Indoor:		Heating	Cooling
Norwood Mem, MA, US		Indoor temperature (°F)		70	75
Elevation: 49 ft		Design TD (°F)		61	13
Latitude: 42°N		Relative humidity (%)		50	50
		Moisture difference (gr/lb)		47.8	31.3
Outdoor:	Heating	Cooling	Infiltration:		
Dry bulb (°F)	9	88	Method	Simplified	
Daily range (°F)	-	21 (M)	Construction quality	Loose	
Wet bulb (°F)	-	73	Fireplaces	1 (Loose)	
Wind speed (mph)	15.0	7.5			

Construction descriptions

	Or	Area	U-value	Ins ul R	Htg HTM	Loss Clg HTM	Gain
		ft²	Btuh/ft²-°F	ft²-°F/Btuh	Btuh/ft²	Btuh	Btuh/ft²
Walls							
12D-0sw : Frm w all, w d ext, 3/8" w ood shth, r-15 cav ins, 1/2" gyps urme		284	0.086	15.0	5.24	1487	1.44
board int fnsh, 2"x4" w ood frm, 16" o.c. stud	se	320	0.086	15.0	5.24	1673	1.44
	sw	254	0.086	15.0	5.24	1332	1.44
	nw	325	0.086	15.0	5.24	1704	1.44
	all	1183	0.086	15.0	5.24	6196	1.44

Partitions
(none)

	Or	Area	U-value	Ins ul R	Htg HTM	Loss Clg HTM	Gain
		ft²	Btuh/ft²-°F	ft²-°F/Btuh	Btuh/ft²	Btuh	Btuh/ft²
Windows							
Double Non-Metal 2015 IECC: Dbl Non-Metal Default; 50% blinds 45°, medium; 6.67 ft head ht	ne	20	0.550	0	33.5	673	27.9
U30 S30: MA minimum; 50% blinds 45°, medium; 50% outdoor insect screen; 6.67 ft head ht	se	22	0.300	0	18.3	400	22.2
	sw	21	0.300	0	18.3	384	22.2
	nw	18	0.300	0	18.3	327	17.6
	nw	41	0.300	0	18.3	745	17.6
	all	110	0.300	0	18.3	2003	19.4
Double Non-Metal 2015 IECC: Dbl Non-Metal Default; 50% blinds 45°, medium; 100% indoor insect screen; 6.67 ft head ht	se	22	0.550	0	33.5	723	45.5
Double Non-Metal 2015 IECC: Dbl Non-Metal Default; 50% blinds 45°, medium; 50% outdoor insect screen; 6.67 ft head ht	sw	37	0.550	0	33.5	1229	45.5

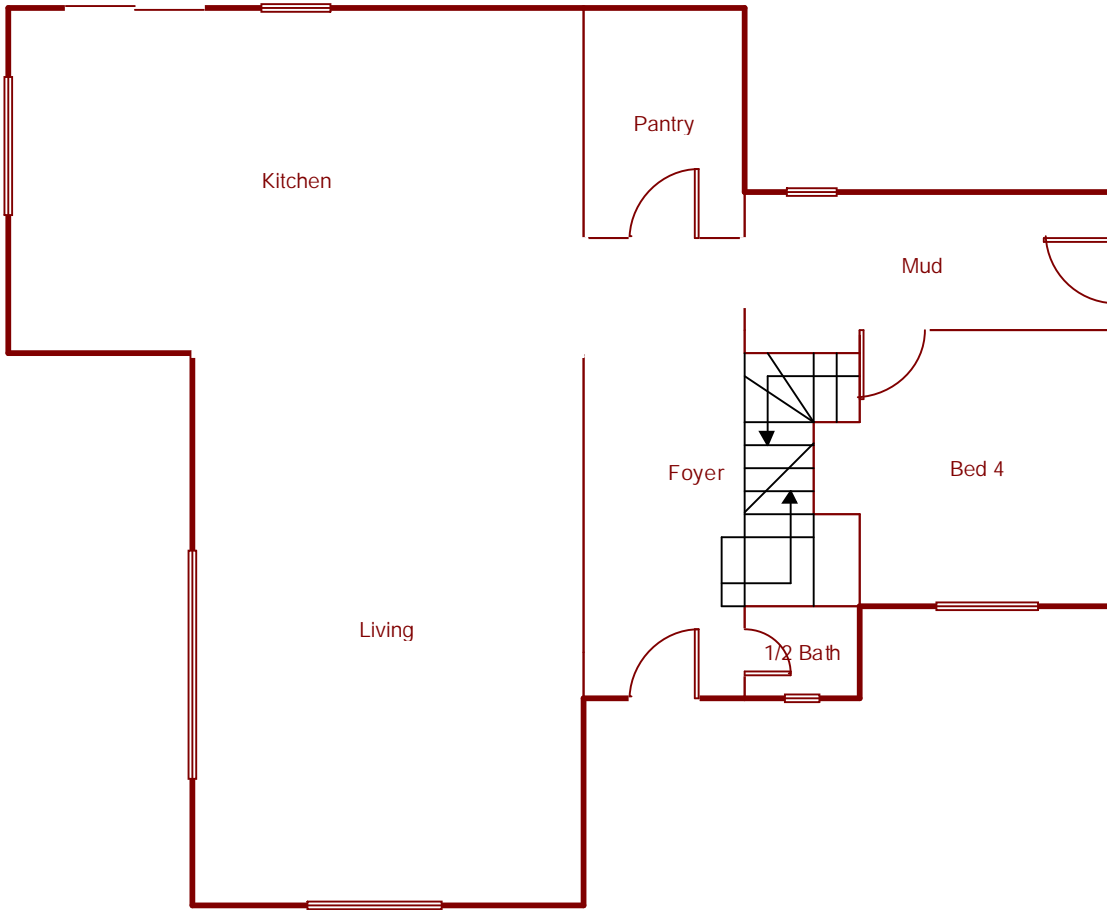
	Or	Area	U-value	Ins ul R	Htg HTM	Loss Clg HTM	Gain
		ft²	Btuh/ft²-°F	ft²-°F/Btuh	Btuh/ft²	Btuh	Btuh/ft²
Doors							
Wood Door w Storm 2015 IECC: Wood Door Default w Storm	se	21	0.200	5.0	12.2	256	2.62

	Or	Area	U-value	Ins ul R	Htg HTM	Loss Clg HTM	Gain
		ft²	Btuh/ft²-°F	ft²-°F/Btuh	Btuh/ft²	Btuh	Btuh/ft²
Ceilings							
16B-38ad: Attic ceiling, asphalt shingles roof mat, r-38 ceil ins, 1/2" gypsum board int fnsh		168	0.026	38.0	1.58	266	1.23

	Or	Area	U-value	Ins ul R	Htg HTM	Loss Clg HTM	Gain
		ft²	Btuh/ft²-°F	ft²-°F/Btuh	Btuh/ft²	Btuh	Btuh/ft²
Floors							
19A-0bvhp: Flr floor, frm flr, 10" thkns, hrd w d flr fnsh, leaky bsmt ovr		1301	0.295	0	6.75	8780	1.44



1st Floor

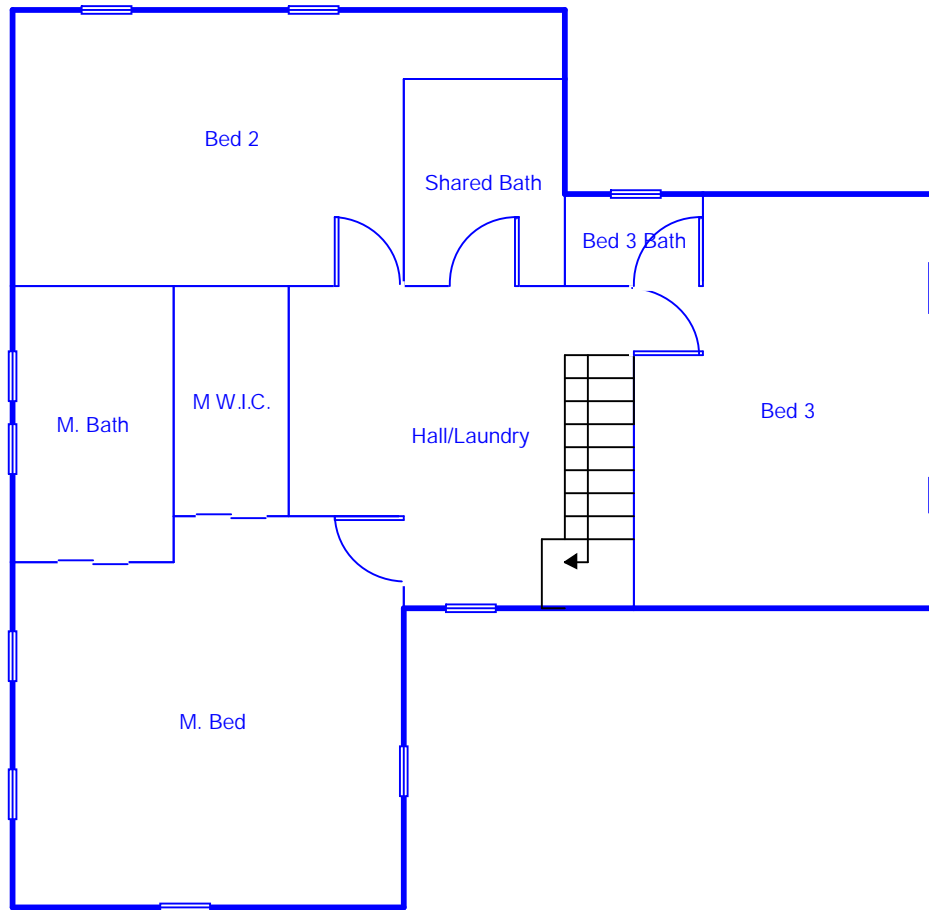


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2nd Floor



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