Residential System Sizing Calculation

Summary

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Roger Elliott

Project Title:
Elliott Residence

Lake City, FL 32055-

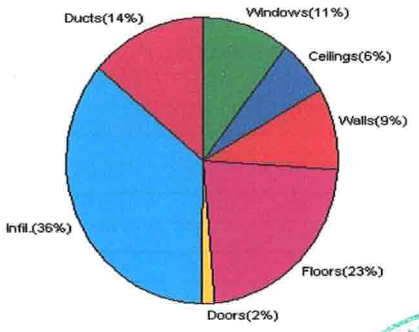
Lot 21 - Country Lake at Woodborough 7/18/2012

Location for weather data: Gainesville, FL - Defaults: Latitude(29.7) Altitude(152 ft.) Temp Range(M) Humidity data: Interior RH (50%) Outdoor wet bulb (77F) Humidity difference(54gr.)					
Winter design temperature(MJ8 99%)	33	F	Summer design temperature(MJ8 99%)	92	F
Winter setpoint	70	F	Summer setpoint	75	F
Winter temperature difference	37	F	Summer temperature difference	17	F
Total heating load calculation	**62200**	**Btuh**	**Total cooling load calculation**	**59460**	**Btuh**
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	119.0	74000	Sensible (SHR = 0.75)	135.0	55500
Heat Pump + Auxiliary(0.0kW)	119.0	74000	Latent	100.8	18500
			Total (Electric Heat Pump)	124.5	74000

WINTER CALCULATIONS

Winter Heating Load (for 3437 sqft)

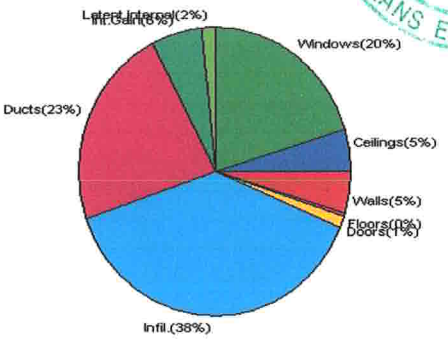
Load component			Load	
Window total	312	sqft	6601	Btuh
Wall total	2303	sqft	5867	Btuh
Door total	60	sqft	1021	Btuh
Ceiling total	3015	sqft	3963	Btuh
Floor total	See detail report		14034	Btuh
Infiltration	547	cfm	22172	Btuh
Duct loss			8541	Btuh
Subtotal			**62200**	**Btuh**
Ventilation	0	cfm	0	Btuh
TOTAL HEAT LOSS			**62200**	**Btuh**



SUMMER CALCULATIONS

Summer Cooling Load (for 3437 sqft)

Load component			Load	
Window total	312	sqft	12050	Btuh
Wall total	2303	sqft	2740	Btuh
Door total	60	sqft	773	Btuh
Ceiling total	3015	sqft	2892	Btuh
Floor total			253	Btuh
Infiltration	411	cfm	7640	Btuh
Internal gain			3550	Btuh
Duct gain			11213	Btuh
Sens. Ventilation	0	cfm	0	Btuh
Blower Load			0	Btuh
Total sensible gain			**41112**	**Btuh**
Latent gain(ducts)			2346	Btuh
Latent gain(infiltration)			15003	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			1000	Btuh
Total latent gain			**18349**	**Btuh**
TOTAL HEAT GAIN			**59460**	**Btuh**



8th Edition

EnergyGauge® System Sizing
PREPARED BY: _____
DATE: _____

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Roger Elliott

Lake City, FL 32055-

Project Title:
Elliott Residence
Building Type: User
Lot 21 - Country Lake at Woodborough

7/18/2012

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 37.0 F (MJ8 99%)

Component Loads for Whole House

Window	Panes/Type	Frame	U	Orientation	Area(sqft) X	HTM=	Load
1	2, NFRC 0.60	Vinyl	0.55	N	37.3	20.4	760 Btuh
2	2, NFRC 0.70	Vinyl	0.55	N	8.9	20.4	181 Btuh
3	2, NFRC 0.70	Vinyl	0.55	E	60.4	20.4	1230 Btuh
4	2, NFRC 0.70	Vinyl	0.80	E	3.4	29.6	99 Btuh
5	2, NFRC 0.70	Vinyl	0.55	S	24.9	20.4	506 Btuh
6	2, NFRC 0.70	Vinyl	0.80	S	4.4	29.6	132 Btuh
7	2, NFRC 0.70	Vinyl	0.80	S	3.1	29.6	90 Btuh
8	2, NFRC 0.70	Vinyl	0.80	W	17.1	29.6	506 Btuh
9	2, NFRC 0.70	Vinyl	0.55	W	4.4	20.4	90 Btuh
10	2, NFRC 0.70	Vinyl	0.55	W	12.4	20.4	253 Btuh
11	2, NFRC 0.70	Vinyl	0.55	N	12.4	20.4	253 Btuh
12	2, NFRC 0.70	Vinyl	0.55	N	10.1	20.4	206 Btuh
13	2, NFRC 0.70	Vinyl	0.55	W	21.8	20.4	443 Btuh
14	2, NFRC 0.70	Vinyl	0.55	W	30.2	20.4	615 Btuh
15	2, NFRC 0.70	Vinyl	0.55	W	24.9	20.4	506 Btuh
16	2, NFRC 0.70	Vinyl	0.55	S	10.9	20.4	222 Btuh
17	2, NFRC 0.70	Vinyl	0.55	S	24.9	20.4	506 Btuh
	Window Total				311.6(sqft)		6601 Btuh

Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area X	HTM=	Load
1	Frame - Wood	- Ext	(0.070)	26.4/0.0	447	2.58	1153 Btuh
2	Frame - Wood	- Ext	(0.070)	26.4/0.0	341	2.58	879 Btuh
3	Frame - Wood	- Ext	(0.070)	26.4/0.0	427	2.58	1100 Btuh
4	Frame - Wood	- Ext	(0.070)	26.4/0.0	334	2.58	860 Btuh
5	Frame - Wood	- Ext	(0.070)	26.4/0.0	150	2.58	387 Btuh
6	Frame - Wood	- Ext	(0.070)	26.4/0.0	199	2.58	513 Btuh
7	Frame - Wood	- Ext	(0.070)	26.4/0.0	230	2.58	592 Btuh
8	Frame - Wood	- Adj	(0.059)	13.0/26.4	176	2.18	383 Btuh
	Wall Total				2303(sqft)		5867 Btuh

Doors	Type	Storm	Ueff.	Area X	HTM=	Load
1	Insulated - Exterior,	n	(0.460)	20	17.0	340 Btuh
2	Insulated - Garage,	n	(0.460)	20	17.0	340 Btuh
3	Insulated - Garage,	n	(0.460)	20	17.0	340 Btuh
	Door Total			60(sqft)		1021Btuh

Ceilings	Type/Color/Surface	Ueff.	R-Value	Area X	HTM=	Load
1	Vented Attic/D/Shing	(0.036)	0.3/26.4	3015	1.3	3963 Btuh
	Ceiling Total			3015(sqft)		3963Btuh

Floors	Type	Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade	(1.180)	0.0	303.6 ft(perim.)	43.7	13255 Btuh
2	Raised Wood - Adj	(0.050)	19.0	420.0 sqft	1.9	779 Btuh
	Floor Total			3435 sqft		14034 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Roger Elliott

Lake City, FL 32055-

Project Title:
Elliott Residence
Building Type: User
Lot 21 - Country Lake at Woodborough

7/18/2012

	Envelope Subtotal:	31486 Btuh
Infiltration	Type Wholehouse ACH Volume(cuft) Wall Ratio CFM= Natural 1.06 30933 1.00 547.4	22172 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.159)	8541 Btuh
All Zones	**Sensible Subtotal All Zones**	**62200 Btuh**

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	62200 Btuh 0 Btuh 62200 Btuh

EQUIPMENT

1. Electric Heat Pump	#	74000 Btuh

Key: Window types - NFRC (Requires U-Factor and Shading coefficient(SHGC) of glass as numerical values)
or - Glass as 'Clear' or 'Tint' (Uses U-Factor and SHGC defaults)
U - (Window U-Factor)
HTM - (ManualJ Heat Transfer Multiplier)

Version 8

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Roger Elliott

Lake City, FL 32055-

Project Title:
Elliott Residence

Lot 21 - Country Lake at Woodborough

7/18/2012

Reference City: Gainesville, FL

Temperature Difference: 17.0F(MJ8 99%)

Humidity difference: 54gr.

Component Loads for Whole House

Window	Type* Panes	SHGC	U	InSh	IS	Ornt	Overhang Len	Hgt	Window Area(sqft) Gross	Shaded	Unshaded	HTM Shaded	Unshaded	Load
1	2 NFRC	0.60,	0.55	No	No	N	2.0ft.	0.5ft.	37.3	0.0	37.3	22	22	820 Btuh
2	2 NFRC	0.70,	0.55	No	No	N	2.0ft.	0.5ft.	8.9	0.0	8.9	24	24	214 Btuh
3	2 NFRC	0.70,	0.55	No	No	E	8.0ft.	0.5ft.	60.4	60.4	0.0	24	77	1455 Btuh
4	2 NFRC	0.70,	0.80	No	No	E	2.0ft.	0.5ft.	3.4	2.1	1.2	28	81	160 Btuh
5	2 NFRC	0.70,	0.55	No	No	S	2.0ft.	0.5ft.	24.9	24.9	0.0	24	30	599 Btuh
6	2 NFRC	0.70,	0.80	No	No	S	2.0ft.	1.5ft.	4.4	4.4	0.0	28	34	126 Btuh
7	2 NFRC	0.70,	0.80	No	No	S	2.0ft.	0.5ft.	3.1	3.1	0.0	28	34	87 Btuh
8	2 NFRC	0.70,	0.80	No	No	W	2.0ft.	0.5ft.	17.1	4.3	12.9	28	81	1163 Btuh
9	2 NFRC	0.70,	0.55	No	No	W	2.0ft.	1.5ft.	4.4	0.3	4.2	24	77	327 Btuh
10	2 NFRC	0.70,	0.55	No	No	W	2.0ft.	0.5ft.	12.4	3.1	9.4	24	77	793 Btuh
11	2 NFRC	0.70,	0.55	No	No	N	2.0ft.	0.5ft.	12.4	0.0	12.4	24	24	300 Btuh
12	2 NFRC	0.70,	0.55	No	No	N	7.0ft.	0.7ft.	10.1	0.0	10.1	24	24	243 Btuh
13	2 NFRC	0.70,	0.55	No	No	W	9.5ft.	0.7ft.	21.8	21.8	0.0	24	77	524 Btuh
14	2 NFRC	0.70,	0.55	No	No	W	9.5ft.	0.5ft.	30.2	30.2	0.0	24	77	728 Btuh
15	2 NFRC	0.70,	0.55	No	No	W	9.5ft.	0.5ft.	24.9	24.9	0.0	24	77	599 Btuh
16	2 NFRC	0.70,	0.55	No	No	S	7.0ft.	0.7ft.	10.9	10.9	0.0	24	30	262 Btuh
17	2 NFRC	0.70,	0.55	No	No	S	2.0ft.	0.5ft.	24.9	24.9	0.0	24	30	599 Btuh
	Excursion													3050 Btuh
	Window Total								312 (sqft)					12050 Btuh

Walls	Type	U-Value	R-Value Cav/Sheath	Area(sqft)	HTM	Load
1	Frame - Wood - Ext	0.07	26.4/0.0	447.3	1.2	539 Btuh
2	Frame - Wood - Ext	0.07	26.4/0.0	340.7	1.2	411 Btuh
3	Frame - Wood - Ext	0.07	26.4/0.0	426.6	1.2	514 Btuh
4	Frame - Wood - Ext	0.07	26.4/0.0	333.5	1.2	402 Btuh
5	Frame - Wood - Ext	0.07	26.4/0.0	149.9	1.2	181 Btuh
6	Frame - Wood - Ext	0.07	26.4/0.0	199.1	1.2	240 Btuh
7	Frame - Wood - Ext	0.07	26.4/0.0	229.7	1.2	277 Btuh
8	Frame - Wood - Adj	0.06	13.0/26.4	176.0	1.0	176 Btuh
	Wall Total			2303 (sqft)		2740 Btuh

Doors	Type	Area (sqft)	HTM	Load
1	Insulated - Exterior	20.0	12.9	258 Btuh
2	Insulated - Garage	20.0	12.9	258 Btuh
3	Insulated - Garage	20.0	12.9	258 Btuh
	Door Total	60 (sqft)		773 Btuh

Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load
1	Vented Attic/DarkShingle	0.036	0.3/26.4	3015.0	0.96	2892 Btuh
	Ceiling Total			3015 (sqft)		2892 Btuh

Floors	Type	R-Value	Size	HTM	Load
1	Slab On Grade	0.0	3015 (ft-perimeter)	0.0	0 Btuh
2	Raised Wood - Adj	19.0	420 (sqft)	0.6	253 Btuh
	Floor Total		3435.0 (sqft)		253 Btuh

	Envelope Subtotal:	18708 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Roger Elliott

Project Title: Elliott Residence

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL 32055-

Lot 21 - Country Lake at Woodborough

7/18/2012

Infiltration	Type		Average ACH		Volume(cuft)		Wall Ratio		CFM=	Load
	Natural(Adjusted for ventilation)		0.80		30933		1		410.5	7640 Btuh
Internal gain		Occupants		Btuh/occupant				Appliance		Load
		5	X	230	+			2400		3550 Btuh
							Sensible Envelope Load:			29898 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)						(DGM of 0.375)			11213 Btuh
							Sensible Load All Zones			**41112 Btuh**

Manual J Summer Calculations

Residential Load - Component Details (continued)

Roger Elliott
Lake City, FL 32055-

Project Title: Elliott Residence
Lot 21 - Country Lake at Woodborough

Climate:FL_GAINESVILLE_REGIONAL_A
7/18/2012

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	**Sensible Envelope Load All Zones**	**29898 Btuh**
	Sensible Duct Load	11213 Btuh
	Total Sensible Zone Loads	**41112 Btuh**
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	**41112 Btuh**
	Latent infiltration gain (for 54 gr. humidity difference)	15003 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	2346 Btuh
	Latent occupant gain (5.0 people @ 200 Btuh per person)	1000 Btuh
	Latent other gain	0 Btuh
	Latent total gain	**18349 Btuh**
	TOTAL GAIN	**59460 Btuh**

EQUIPMENT

1. Central Unit	#	74000 Btuh

*Key: Window types (Panes - Number and type of panes of glass)
(SHGC - Shading coefficient of glass as SHGC numerical value)
(U - Window U-Factor)
(InSh - Interior shading device: none(No), Blinds(B), Draperies(D) or Roller Shades(R))
- For Blinds: Assume medium color, half closed
For Draperies: Assume medium weave, half closed
For Roller shades: Assume translucent, half closed
(IS - Insect screen: none(N), Full(F) or Half(½))
(Ornt - compass orientation)

Version 8

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FORMS

FORM 402-2010	FLORIDA BUILDING CODE, ENERGY CONSERVATION Residential Building Thermal Envelope Approach	ALL CLIMATE ZONES

Scope: Compliance with Section 402 of the *Florida Building Code, Energy Conservation*, shall be demonstrated by the use of Form 402 for single- and multiple-family residences of three stories or less in height, additions to existing residential buildings, renovations to existing residential buildings, new heating, cooling, and water heating systems in existing buildings, as applicable. To comply, a building must meet or exceed all of the energy efficiency requirements on Table 402A and all applicable mandatory requirements summarized in Table 402B of this form. If a building does not comply with this method or Alternate Form 402, it may still comply under Section 405 of the *Florida Building Code, Energy Conservation*.

PROJECT NAME AND ADDRESS:	ELLIOTT RESID. NW COUNTRY LK. DR. LAKE CITY, FL	BUILDER: BLAKE CONSTRUCTION PERMITTING OFFICE: COLUMBIA CO.	
OWNER: ROGER ELLIOTT		PERMIT NO.:	JURISDICTION NO.: 221000

General Instructions:
1. New construction which incorporates any of the following features cannot comply using this method: glass areas in excess of 20 percent of conditioned floor area, electric resistance heat and air handlers located in attics. **Additions ≤ 600 sq.ft., renovations and equipment changeouts may comply by this method with exceptions given.**
2. Fill in all the applicable spaces of the "To Be Installed" column on Table 402A with the information requested. All "To Be Installed" values must be equal to or more efficient than the required levels.
3. Complete page 1 based on the "To Be Installed" column information.
4. Read the requirements of Table 402B and check each box to indicate your intent to comply with all applicable items.
5. Read, sign and date the "Prepared By" certification statement at the bottom of page 1. The owner or owner's agent must also sign and date the form.

	Please Print	CK
1. New construction, addition, or existing building	1. NEW	
2. Single-family detached or multiple-family attached	2. SF	
3. If multiple-family–No. of units covered by this submission	3. —	
4. Is this a worst case? (yes/no)	4. NO	
5. Conditioned floor area (sq. ft.)	5. 3437	
6. Glass type and area:		
a. U-factor	6a. 0.55	
b. SHGC	6b. 0.7	
c. Glass area	6c. 311.6 sq. ft.	
7. Percentage of glass to floor area	7. 9.1 %	
8. Floor type, area or perimeter, and insulation:		
a. Slab-on-grade (R-value)	8a. R= 0 303.6 lin.ft.	
b. Wood, raised (R-value)	8b. R= 19 420 sq.ft.	
c. Wood, common (R-value)	8c. R= sq.ft.	
d. Concrete, raised (R-value)	8d. R= sq.ft.	
e. Concrete, common (R-value)	8e. R= sq.ft.	
9. Wall type, area and insulation:		
a. Exterior: 1. Masonry (Insulation R-value)	9a-1. R= sq.ft.	
2. Wood frame (Insulation R-value)	9a-2. R= 26.4 2126.9 sq.ft.	
b. Adjacent: 1. Masonry (Insulation R-value)	9b-1. R= sq.ft.	
2. Wood frame (Insulation R-value)	9b-2. R= 13 176 sq.ft.	
10. Ceiling type, area and insulation:		
a. Under attic (Insulation R-value)	10a. R= sq.ft.	
b. Single assembly (Insulation R-value)	10b. R= 30 3624 sq.ft.	
11. Air distribution system: Duct insulation, location, Qn		
a. Duct location, insulation	11a. R= COND. R=6	
b. AHU location	11b. INTERIOR	
c. Qn, Test report attached (< 0.03; yes/no)	11c. Test report attached? Yes No	
12. Cooling system:		
a. Type	12a. Type: CENTRAL-SPLIT	
b. Efficiency	12b. SEER/EER: 14	
13. Heating system:		
a. Type	13a. Type: HEAT PUMP	
b. Efficiency	13b. HSPF/COP/AFUE: 7.7	
14. HVAC sizing calculation: attached	14. Yes No	
15. Hot water system:		
a. Type	15a. Type: TANKLESS	
b. Efficiency	15b. EF: 0.8	

COLUMBIA COUNTY BUILDING DEPARTMENT
Received for FILE COPY
Code Compliance
PLANS EXAMINER

I hereby certify that the plans and specifications covered by the calculation are in compliance with the Florida Energy Code.
PREPARED BY: T. A. Dolhere DATE: 7/17/12

I hereby certify that this building is in compliance with the Florida Energy Code:
OWNER AGENT: _____ DATE: _____

Review of plans and specifications covered by this calculation indicates compliance with the Florida Energy Code. Before construction is completed, this building will be inspected for compliance in accordance with Section 553.908, F.S.
CODE OFFICIAL: _____
DATE: _____

TABLE 402A

BUILDING COMPONENT	PERFORMANCE CRITERIA[1]	INSTALLED VALUES:	
Windows (see Note 2): Skylights	U-Factor < 0.65 SHGC = 0.30 % of CFA < = 20% U-Factor < 0.75	U-Factor = 0.55 SHGC = 0.7 % of CFA = 9.1	
Doors: Exterior door U-Factor	U-Factor < 0.65	U-Factor = 0.46	
Floors: Slab-on-grade Over unconditioned spaces (see Note 3)	No requirement R-13	R-Value = 0	
Walls – Ext. and Adj. (see Note 3): Frame Mass (see Note 3) Interior of wall: Exterior of wall:	 R-13 R-7.8 R-6	 R-Value = 26.4 R-Value = R-Value =	
Ceilings (see Notes 3 & 4) Reflectance	R=30 0.25	R-Value = 30 Reflectance = 0.25	Test report Attached? Yes/No
Air distribution system (see Note 4) Ductwork & air handling unit: Unconditioned space Conditioned space Duct R-value Air leakage Qn	 Not allowed R-value ≥ 6 Qn ≤ 0.03	 Location: CONDITIONED R-Value = 6 Qn = 0.03	Test report Attached? Yes/No
Air conditioning systems (see Note 5)	SEER = 13.0	SEER = 14	
Heating system Heat pump (see Note 5) Cooling: Heating: Gas furnace Oil furnace Electric resistance: Not allowed (see Note 5)	 SEER = 13.0 HSPF = 7.7 AFUE 78% AFUE 78%	 SEER = 14 HSPF = 7.7 AFUE = AFUE =	
Water heating system (storage type) Electric (see Note 6): Gas fired (see Note 7): Other (describe):	 40 gal: EF = 0.92 50 gal: EF = 0.90 40 gal: EF = 0.59 50 gal: EF = 0.58	 Gallons = EF = Gallons = 1- TANKLESS EF = 0.8	

(1) Each component present in the As Proposed home must meet or exceed each of the applicable performance criteria in order to comply with this code using this method; otherwise Section 405 compliance must be used.

(2) Windows and doors qualifying as glazed fenestration areas must comply with both the maximum U-Factor and the maximum SHGC (solar Heat Gain Coefficient) criteria and have a maximum total window area equal to or less than 20% of the conditioned floor area (CFA); otherwise Section 405 must be used for compliance.
Exception: Additions of 600 square feet (56 m^2) or less may have a maximum glass to CFA of 50 percent.

(3) R-values are for insulation material only as applied in accordance with manufacturers' installation instructions. For mass walls, the "interior of wall" requirement must be met except if at least 50% of the R-6 insulation required for the "exterior of wall" is installed exterior of, or integral to, the wall.

(4) Ducts & AHU installed substantially leak free per Section 403.2.2.1. Test by Class 1 BERS rater required.
Exception: Ducts installed onto an existing air distribution system as part of an addition or renovation; duct must be R-6 installed per Sec. 503.2.7.2.

(5) For all conventional units with capacities greater than 30,000 Btu/hr. For other types of equipment, see Tables 503.2.3(1-8).
Exception: The prohibition on electric resistance heat does not apply to additions, renovations and new heating systems installed in existing buildings.

(6) For other electric storage volumes, minimum EF = 0.97-(0.00132 x volume).

(7) For other natural gas storage volumes, minimum EF = 0.67-(0.0019 x volume).

TABLE 402B MANDATORY REQUIREMENTS

COMPONENTS	SECTION	REQUIREMENTS	CHECK
Air leakage	402.4	To be caulked, gasketed, weatherstripped or otherwise sealed. Recessed lighting IC-rated as meeting ASTM E 283. Windows and doors = 0.30 cfm/sq.ft. Testing or visual inspection required. Fireplaces: gasketed doors & outdoor combustion air.	✓
Ceilings/knee walls	405.2.1	R-19 space permitting.	✓
Programmable thermostat	403.1.1	Where forced-air furnace is primary system, programmable thermostat is required.	✓
Air distribution system	403.2	Ducts in attics or on roofs insulated to R-8; other ducts R-6. Ducts tested to Q_n = 0.03 by a Class 1 BERS rater.	✓
Water heaters	403.4	Heat trap required for vertical pipe risers. Comply with efficiencies in Table 403.4.3.2. Provide switch or clearly marked circuit breaker (electric) or shutoff (gas). Circulating system pipes insulated to = R-2 + accessible manual OFF switch.	✓
Swimming pool & spas	403.9	Spas and heated pools must have vapor-retardant covers or a liquid cover or other means proven to reduce heat loss except if 70% of heat from site-recovered energy. Off/timer switch required. Gas heaters minimum thermal efficiency = 78% (82% after 4/16/13). Heat pump pool heaters minimum COP= 4.0.	N/A
Cooling/heating equipment	403.6	Sizing calculation performed & attached. Minimum efficiencies per Tables 503.2.3. Equipment efficiency verification required. Special occasion cooling or heating capacity requires separate system or variable capacity system. Electric heat >10kW must be divided into two or more stages.	✓
Lighting equipment	404.1	At least 50% of permanently installed lighting fixtures shall be high-efficacy lamps.	✓