	Green 2015 I	Building Ei ECC Resid	nergy Sus ential DF	stainability Inc. W area handout		
103.2	Informatio 1. <u>Designa</u> 2. <u>Insulati</u> 3. <u>Fenestr</u> 4. <u>Area wa</u> 5. <u>Mechar</u> 6. <u>Mechar</u> 7. <u>Equipm</u> 8. <u>Duct se</u> 9. Air Seal	n required on const ation of the Therma on Material and the ation U and SHGC v eighted U factor & S nical system design nical and Water hea ent and system con aling, duct & pipe in ing details	ruction docume <u>I Building Envelo</u> <u>eir R-Value</u> <u>alues</u> <u>GHGC calculation</u> <u>criteria (Manua</u> <u>ting equipment</u> <u>trols</u> <u>nsulation and lo</u>	ents ope on the plans <u>ns I J & S)</u> types, sizes, and efficiencies <u>cations</u>		
103.4	Amended construction documents shall be resubmitted for approval					
104.2	Required E	Required Energy inspections				
104.2	104.2.1Footing and foundation inspection for insulation on buried plu104.2.2Framing (Predrywall) inspection for air sealing, insulation, U aSHGC values					
	104.2.3	Plumbing insulat	ion and control	inspection		
	104.2.4	Mechanical inspection of system size & efficiency, duct insulation, duct leakage testing, programmable thermostat and minimum fan efficiency				
	104.2.5	Final inspection of		in and high-efficacy lamps		
303.1.1.1	Attic insula insu	tion depth marker lation with thicknes	every 300 sqft. ss and R value fo	R value certificate for installed or SPF included on certificate		
303.1.3	Fenestration product rating chart on every window with U – factor, SHGC and Visible Transmission					
303.2	Insulation installation to manufacturer's instructions and IBC / IRC requirements					
401.3(M)	Certificate app and	posted on a wall wl roved location with mechanical efficien	here the furnace system R or U v cies	e is located, a utility room or other values of system components, SHGC		
402.1.1	(P) Buildin	g Envelope General	exemptions for	r < 3.4 Btu/h/sqft or 1.0 watt/sqft		
402.1.2	(P) Prescri	(P) Prescriptive requirements for assembly components				
	Fenestration		U – Factor	≤ 0.35		
	Skylight		U – Factor	≤ 0.55		
	Solar Heat	Gain Coefficient	SHGC value	<u>≤ 0.25</u>		
	Ceiling		R – value	R - 38		
	Walls		R – value	R – 20 or 13 + 5 ci		
	Floors		R – value	R - 19		
	Crawlspace	e / Basement	R value	R – 5 ci or R – 13 batt		

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402.2.1	R-30 ceiling insulation minimum required in all areas (limited to 500 sqft or 20%		
	of total ceiling area). <u>Uncompressed R – 30 insulation over the exterior</u>		
	wall top plate will be deemed to meet the R-38 requirement.		
402.2.3	Eave baffle required in vented attics adjacent to soffit or eave vents and maintain		
	the same size as vent and extend over the top of air-permeable insulation.		
402.2.4	Attic access hatches and doors must be weather-stripped and insulated to the sa		
	level as surrounding spaces. A retainer is required to prevent loose		
	insulation from spilling into the living area. <u>Vertical attic doors must have</u>		
	<u>a U factor on .35 or less.</u>		
402.2.6	Steel framing has increased insulation values. See chart 402.2.6		
402.2.8	Floor insulation will be installed with permanent contact to the underside of		
	subfloor decking or meet the floor insulation value and completely insulate		
	the floor rim joist area to wall values.		
402.2.11	Crawlspace walls may be insulated if not vented to the exterior using an alternative		
	method with horizontal insulation extending 24 inches and all exposed earth		
	covered with a Class 1 vapor retarder. Joints shall be lapped 6 inches and		
	be taped or sealed. Vapor retarder will extend at least 6 inches up stem		
	wall.		
402.4	(M) Air leakage will be tested with a Blower Door and limited to <u>3 ACH</u> (Air		
	Changes per Hour) at 50 Pascals. Written results will be provided to		
	the code official.		
402.4.2	Woodburning fireplaces will have tight-fitting flue dampers or doors and an		
	outdoor combustion air source.		
402.4.4	Rooms containing a fuel-burning appliance with open combustion air ducts, the		
	ducts will be insulated where they pass through conditioned space to a		
	minimum R-8 value.		
402.4.5	Recessed Lights will be IC rated & Airtight (<2 cfm @ 75 Pa). Seal building		
	envelope penetration using gasket or caulk		
402.5	The maximum area weighted average for fenestration SHGC factor is .50		
402.4.1.1	Cavities within corner and headers or framing walls shall be insulated by		
	completely filling the cavity with a material that has an R-3 per inch value.		
	A continuous air barrier is required on the exterior from the top plate to the		
	foundation		
	<u>≤ 8 Perms</u>		
403.1	(M) Programmable thermostat with a daily schedule with set back capabilities with		
	initial programming setpoint no higher than 70° F for heat and 78° F for		
	cooling		

403.3.1	(P) <u>Duct insulation on supply and return ducts</u> will be a minimum of R-8 on ducts greater than 3 inches in diameter and R-6 on ducts less than 3 inches. Ducts located inside the building envelope are exempted.		
403.3.2	(M) Ducts, air handlers, and filter boxes shall be sealed per the IRC or IMC. Air Impermeable spray foam products are permitted without additional joint seals.		
403.3.2.1	Air handlers will have a manufacturer's designation of no greater than 2% at design rated flow.		
403.3.3	 (P) Duct tightness verification required (@ 25 Pa) Written results will be provided to the code official. 1. Rough-in test ≤ 4 cfm / 100 Sqft of conditioned area. Where the air handler is not installed, leakage is limited to 3 cfm/100 Sqft 2. Post-construction test ≤ 4 cfm / 100 Sqft of conditioned area 		
403.2.3 403.3	 (M) Building cavities may not be used as supply ducts (M) Mechanical system piping requires R – 3 insulation if carrying fluids above 105° or below 55° 		
403.5.1.1	(M) Circulating hot water systems using a dedicated return or cold water line has controls that will automatically turn the pump off when the water in the circulating loop is at the desired temperature and when there is no hot water demand.		
403.5.3	(P) Minimum R-3 insulation will be used on hot water piping ¾ " and larger, piping serving more than 1 unit, piping outside the conditioned space, piping from a water heater to a distribution manifold, piping under a slab floor, buried in piping or hot and cold piping on recirculation systems other than demand systems.		
403.6	(M) Mechanical ventilation outdoor intakes and exhaust vents will have automatic or gravity dampers that close when the system is not in operation.		
403.6.1	(M) Range hoods, in-line fans and bathroom / utility room ventilation will meet vent fan efficiencies - < 10 cfm is 1.4 cfm/watt > 10 cfm is 2.8 cfm/watt		
403.7 403.10.2	 (M) Manual J and S calculations are required for HVAC system sizing (M) Electric power to pool and spa heaters will be controlled by a ready accessible on / off switch within 3 feet of the heater. 		
403.10.3 403.10.4 404.1	 (M) Timer switches shall be installed on pool and spa heaters and pump motors. (M) Outdoor heated pools and spas will have a vapor retardant cover (M) Lighting Requirement 75% of lamps are high efficacy lamps and can use lamp or fixture calculation method options 		
404.1.1	(M) Fuel gas lamp shall not have continuous burning pilot lights		

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General requirements A continuous air barrier shall be installed in the building envelope. The exterior thermal envelope contains a continuous air barrier. Breaks or joints in the air barrier shall be sealed Air-permeable insulation shall not be used as a sealing method Ceiling/attic The air barrier in any drop ceiling/soffit shall be aligned with the insulation and any gaps in the air barrier shall be sealed. Access opening, drop down stairways, or knee wall doors to unconditioned attic spaces shall be sealed The insulation in any dropped ceiling/soffit shall be aligned with the air barrier. Walls The junction of the foundation and sill plate shall be sealed. The junction of the top plate and the top of the exterior wall shall be sealed. Knee walls shall be sealed Cavities within corners and headers of frame walls shall be insulated by completely filling the cavity with a material having a thermal resistance of <u>R-3 per inch</u> minimum. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier Windows, skylights, and doors The space between window/door jambs and framing and skylights and framing shall be sealed. Rim Joist shall be insulated Floors The air barrier shall be at any exposed (including and cantilevered floors Rim joist shall be insulated maintain permanent contact with the underside of subflooring, or floor framing cavity insulation shall be permitted to be in contact with the top side of the sheathing or continuous insulation on the underside of subflooring shall be permited to be in contact with the top side of the sheathing or continuous insulation on the underside of subflooring, or floor framing cavity	Component	Air Barrier Criteria	Insulation Criteria
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walls spaces shall be covered with a Class 1 insulation, insulation shall be permanently attached to the crawl space walls. walls aped permanently attached to the crawl space walls.	Crawl space	Exposed earth in unvented crawl	where provided instead of floor
vapor retarder with overlapping joints taped permanently attached to the crawl space walls.	walls	spaces shall be covered with a Class 1	insulation, insulation shall be
		vapor retarder with overlapping joints	permanently attached to the crawl
			space walls.

Component	Air Barrier Criteria	Insulation Criteria
Shaft,	Duct shafts, utility penetrations, and	
penetrations	flue shafts opening to exterior or	
	unconditioned space shall be sealed	
Narrow Cavities		Batts in narrow cavities shall be
		cut to fit, or narrow cavities shall
		be filled by insulation that on
		installation readily conforms to
		the available cavity space
Garage	Air sealing shall be provided between	
separations	the garage and conditioned spaces	
Recessed	Recessed light fixtures installed in	Recessed light fixtures installed
Lighting	the building thermal envelope shall	in the building thermal envelope
	be sealed to the drywall.	shall be airtight and IC rated.
Plumbing and		Batt insulation shall be cut neatly
wiring		to fit around wiring and plumbing
		in exterior walls or insulation that
		on installation readily conforms
		to available space shall extend
		behind piping and wiring
Shower/tub on	The air barrier installed at exterior	Exterior walls adjacent to
exterior wall	walls adjacent to showers and tubs	showers and tubs shall be
	shall separate them from the showers	insulated
	and tubs.	
Electrical/phone	The air barrier shall be installed	
box on exterior	behind the electrical or	
walls	communication boxes or air-sealed	
	boxes shall be sealed	
HVAC register	HVAC register boots that penetrate	
boots	building thermal envelope shall be	
<u>C1.1</u>	Sealed to the submoor of drywall	
Concealed	when required to be sealed,	
sprinklers	concealed fire sprinkler shall be	
	sealed in a manner that is	
	Coullying on other adhesive scalarts	
	caulking of other adnesive sealants	
	fire sprinkler cover plates and wells	
	or coilings	
	or centings	