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RESIDENTIAL ENERGY EFFICIENCY GUIDELINES

This document is intended to provide guidance for compliance with Virginia's energy efficiency requirements for design and construction of residential 1 & 2 family dwellings. The following are **prescriptive** requirements* set forth by Chapter 11 of the 2009 Virginia Residential Code, and shall be used in its entirety. The following requirements shall be verified by field inspection during the construction process.

* Alternatively, the applicant may use the performance requirements set forth by 2009 Virginia Energy Conservation Code §405, using simulated performance programs such as ResCheck™.

Note - Applicable Virginia Climate Zone: 4A

- **BUILDING THERMAL ENVELOPE (§N1102)**

- **ROOF/CEILING INSULATION (Minimum value R-38)**

- Thermally isolated sunroom (Minimum value R-19)

- **WALL INSULATION (Minimum value R-13)**

- Steel-framed (plus R-5 continuous insulation)

- Mass wall above grade (minimum value R-5)

- Thermally isolated sunroom? (minimum value R-13)

- **FLOOR INSULATION (minimum value R-19)**

- Over enclosed unconditioned space - Locations

- Over outside air - Locations

- **BASEMENT WALL BELOW GRADE (minimum R-10)**

- Interior insulation: continuous

- Interior insulation: between studs/furring (minimum value R-13)

- Exterior insulation placement – Locations

- **CRAWL SPACE WALLS (minimum value R-10)**

- Crawl space vapor retarder required (class I, 6 mil - §402.2.9)

SLAB ON GRADE FLOORS (minimum value R-10)

Floor surface within 12" of grade? If yes, R-10

Insulation has a total developed length of 2 feet (horizontal & vertical)

Heated slab: R-15 (embedded heating elements)

- **WINDOWS & DOORS [FENESTRATION] (§N1102.3)**

WINDOW U-FACTORS – excluding skylights (minimum U - 0.35)

Exempt window locations (15 ft² maximum under prescriptive approach)

Thermally Isolated Sunroom: U – 0.50 (Skylights: U-0.75)

DOOR U-FACTORS (only for doors with glazing)

Thermally isolated sunroom per manufacturer specification for U-factor

Exempt door location (24 ft² maximum for 1 opaque swinging door under prescriptive approach)

Thermally isolated sunroom, doors separating the sunroom from conditioned space shall meet §402

SKYLIGHT U-FACTORS (minimum U - 0.60)

Thermally isolated sunroom per manufacturer specification for U-factor

- **AIR LEAKAGE (§N1102.4)**

The building thermal envelope shall be durably sealed to limit air infiltration. Note - this shall be verified at the time of inspection

Testing Option – blower door test

Visual Inspection Option

- **SYSTEMS (§N1103)**

CONTROLS (§N1103.1)

7-day programmable thermostat (Primary heating system is forced air furnace)

Heat pump supplementary heat

DISTRIBUTION (Supply & Return) Ducts (§N1103.2)

Insulation (§N1103.2.1)

Outside thermal envelope (minimum value R - 8)

Inside thermal envelope* (Minimum value R - 6)

* Please note for ducts completely within the building thermal envelope, insulation is not required

Sealing (§N1103.2.2) All duct, air handler, filter box and building cavity seam and joints shall be sealed

Testing Option – blower door test

Visual Inspection Option

MECHANICAL SYSTEM PIPING INSULATION (§N1103.3)

Piping insulation (minimum value R-3)

CIRCULATING HOT WATER SYSTEM (§N1103.4)

Piping insulation (minimum value R-2)

Automatic or manual pump turn off switch

MECHANICAL VENTILATION (§N1103.5) Outdoor air intakes and exhausts

HEATING & COOLING EQUIPMENT SIZING (§N1103.6)

Heating and cooling equipment shall be sized in accordance with ACCA Manual S based on building loads calculated in accordance with ACCA Manual J or other approved heating and cooling methodologies per 2009 VRC §M1401.3

Snow Melting System Controls (§N1103.7)

POOLS (§N1103.8)

Pool Heaters – on/off switch

Time Switches – automatic on/off switch for heaters and pumps

Pool Covers

Heated pools require vapor retardant pool cover

Heated pools > 90°F requires pool cover with minimum R-12 insulation

LIGHTING SYSTEMS (§N1103.8) – Compact Fluorescent Lamps (CFL), T-8 or smaller diameter linear fluorescent lamps or minimum 50% of lamps of high-efficacy as follows:

- 40 lumens/watt for lamps ≤ 15 watts
- 50 lumens/watt for lamps > 15 to 40 watts
- 60 lumens/watt for lamps > 40 watts

Residential Compliance Process Flow-chart



