
Builder/General Contractor Definitions

The following definitions apply to the general requirements and application of the 2020 Vermont Residential Building Energy Standard as relating to the general scope of influence of the **Designer/Builder/General Contractor**. This list is a summary of the most relevant definitions to the scope of work of the **Designer/Builder/General Contractor** but is not an all-inclusive list of definitions nor should stand to replace the full definitions list provided in the 2020 RBES under *Sections R201-R202 -General Definitions*. The full list of code terms and definitions can be found in this section. For additional information or support on the RBES code, please contact the Energy Code Assistance Center @ 855-887-0673

General Definitions

BUILDER. The general contractor or other person in charge of construction, who has the power to direct others with respect to the details to be observed in construction. (Source: VT 30 V.S.A. § 51)

OWNER BUILDER. If all of the following apply:

1. The owner of the residential construction is the builder, as defined under this chapter.
2. The residential construction is used as a dwelling by the owner.
3. The owner in fact directs the details of construction with regard to the installation of materials not in compliance with RBES.
4. The owner discloses in writing to a prospective buyer, before entering into a binding purchase and sales agreement, with respect to the nature and extent of any noncompliance with RBES. Any statement or certificate given to a prospective buyer shall itemize how the home does not comply with RBES, and shall itemize which measures do not meet the RBES standards in effect at the time construction commenced.

RESIDENTIAL BUILDING. For this code, includes detached one- and two-family dwellings, multifamily housing and multiple single-family dwellings (townhouses as well as *Group R-2*, R-3 and R-4 buildings three stories or less in height above grade plane. (See "Occupancy Classifications").

SINGLE-FAMILY DWELLING. Fully detached, semi-detached (semi-attached, side-by-side), row houses, and townhouses. In the case of attached units, each must be separated from the adjacent unit by a ground-to-roof wall in order to be classified as a single-family structure. Also, these units must not share heating/air-conditioning systems or utilities. (From www.census.gov).

ADDITION. An extension or increase in the *conditioned space* floor area, number of stories or height of a building or structure.

ALTERATION. Any construction, retrofit or renovation to an existing structure other than *repair* or *addition*. Also, a change in a building, electrical, gas, mechanical or plumbing system that involves an extension, addition or change to the arrangement, type or purpose of the original installation.

HUNTING CAMP. A seasonal building used as a temporary residence only during hunting season.

SUMMER CAMPS. Residential buildings constructed for non-winter occupation with only a biomass (wood) or other on-site renewable heating system.

REPAIR. The reconstruction or renewal of any part of an existing *building* for the purpose of its maintenance or to correct damage.

MULTIFAMILY DWELLING/BUILDING. For the purpose of determining the building type that must comply with RBES under Vermont statute, a multifamily building is a *residential building* or *mixed use* building with three or more *dwelling units* three stories or less in height. Multifamily buildings of four stories or more in height must comply with CBES.

COMMERCIAL BUILDING. For this code, all buildings that are not included in the definition of “Residential building,” excluding mobile homes.

MIXED-USE. With respect to a structure that is three stories or less in height and is a mixed-use building that shares residential and commercial users, the term “residential building” shall include the living spaces in the structure and the nonliving spaces in the structure that serve only the residential users such as common hallways, laundry facilities, residential management offices, community rooms, storage rooms, and foyers. (From Vermont 30 V.S.A. § 51.)

STRETCH CODE. A building energy code that achieves greater energy savings than the base RBES. The Stretch Code is required for Act 250 projects and may be adopted by municipalities.

REROOFING. The process of recovering or replacing an existing roof covering. See “Roof recover” and “Roof replacement.”

ROOF RECOVER. The process of installing an additional roof covering over a prepared existing roof covering without removing the existing roof covering.

ROOF REPAIR. Reconstruction or renewal of any part of an existing roof for the purposes of its maintenance.

ROOF REPLACEMENT. The process of removing the existing roof covering, repairing any damaged substrate and installing a new roof covering.

Building Definitions

ABOVE-GRADE WALL. A wall more than 50 percent above grade and enclosing *conditioned space*. This includes between-floor spandrels, peripheral edges of floors, roof and basement knee walls, dormer walls, gable end walls, walls enclosing a mansard roof and *skylight* shafts.

EXTERIOR WALL. Walls that are part of the *Building Thermal Envelope*, including both above-grade walls and *basement walls*.

BASEMENT WALL. A wall 50 percent or more below grade and enclosing *conditioned space*.

BATHROOM. A room containing a bathtub, shower, spa or similar bathing fixture.

BEDROOM. A room or space 70 square feet or greater, with egress window and closet, used or intended to be used for sleeping. A “den,” “library,” or “home office” with a closet, egress window, and 70 square feet or greater or other similar rooms shall count as a bedroom, but living rooms and foyers shall not.

CRAWL SPACE WALL. The opaque portion of a wall that encloses a crawl space and is partially or totally below grade.

ROOF ASSEMBLY. A system designed to provide weather protection and resistance to design loads. A roof assembly can be part of the building thermal envelope if it also includes insulation and an air barrier. A roof assembly includes the roof covering, underlayment, roof deck, structural members, and if it is part of the thermal envelope, insulation, air barrier, vapor retarder and interior finish. The gross area of a roof assembly consists of the total interior surface of all roof/ceiling components, including opaque surfaces, dormer and bay window roofs, trayed ceilings, overhead portions of an interior stairway to an unconditioned attic, doors and hatches, glazing and skylights exposed to *conditioned space*, that are horizontal or sloped at an angle less than 60 degrees (1.1 rad) from the horizontal (see “Exterior wall”). A roof assembly that is part of the thermal envelope, or portions thereof, having a slope of 60 degrees (1.1 rad) or greater from horizontal shall be considered in the gross area of exterior walls and thereby excluded from consideration in the roof assembly. Skylight shaft walls 12 inches (305 mm) in depth or greater (as measured from the ceiling plane to the roof deck) shall be considered in the gross area of exterior walls and are thereby excluded from consideration in the roof assembly.

DWELLING UNIT. A single unit providing complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation.

SUNROOM. A one-story structure attached to a dwelling with a glazing area in excess of 40 percent of the gross area of the structure's *exterior walls* and roof.

R-VALUE (THERMAL RESISTANCE). The inverse of the time rate of heat flow through a body from one of its bounding surfaces to the other surface for a unit temperature difference between the two surfaces, under steady state conditions, per unit area ($h \cdot \text{ft}^2 \cdot ^\circ\text{F}/\text{Btu}$) [$(\text{m}^2 \cdot \text{K})/\text{W}$].

Building Envelope Components

AIR BARRIER. An air barrier is a durable assembly that blocks air flow through the *building thermal envelope* and its assemblies. Air barriers must be continuous, sealed at all joints, penetrations, and interruptions using durable sealants intended for such use and compatible with all adjacent materials, and able to resist pressures without displacement or damage.

CONTINUOUS AIR BARRIER. *A combination of materials and assemblies* that prevent the passage of air through the *building thermal envelope*.

AIR-IMPERMEABLE INSULATION. An insulation that also functions as an air barrier material, having an air permeance equal to or less than 0.02 L / s-m² at 75 Pa pressure differential as tested in accordance with ASTM E 2178 or E 283.

VAPOR RETARDER. A vapor-resistant material, membrane or covering such as foil, plastic sheeting or insulation facing with a permeance rating of less than 10. Vapor retarders limit the amount of moisture vapor that passes through a material or wall assembly.

BUILDING THERMAL ENVELOPE. The *basement walls, exterior walls, floor, roof* and any other *building* elements that enclose *conditioned space*. This boundary also includes the boundary between *conditioned space* and exempt or unconditioned space.

CONTINUOUS INSULATION (ci). Insulating material that is continuous across all structural members without thermal bridges other than fasteners and service openings. It is installed on the interior or exterior, or is integral to any opaque surface, of the *building* envelope.

HEATED SLAB. Slab-on-grade construction in which the heating elements, hydronic tubing, or hot air distribution system is in contact with, or placed within or under, the slab.

SLAB-ON-GRADE EDGE INSULATION. Insulation around, or underneath, the perimeter of the floor slab when the top edge of the floor perimeter slab is above the finished grade or 12 inches (305 mm) or less below the finished grade.

STANDARD TRUSS. Any construction that does not permit the roof/ceiling insulation to achieve the required *R*-value over the exterior walls.

INFILTRATION. The uncontrolled inward air leakage into a *building* through the building thermal envelope caused by the pressure effects of wind or differences in the indoor and outdoor air density or both.

R-VALUE (THERMAL RESISTANCE). The inverse of the time rate of heat flow through a body from one of its bounding surfaces to the other surface for a unit temperature difference between the two surfaces, under steady state conditions, per unit area ($h \cdot \text{ft}^2 \cdot ^\circ\text{F}/\text{Btu}$) [$(\text{m}^2 \cdot \text{K})/\text{W}$].

U-FACTOR (THERMAL CONDUCTANCE). The coefficient of heat transmission (air to air) through a building component or assembly, equal to the time rate of heat flow per unit area and unit temperature difference between the warm side and cold side air films ($\text{Btu}/\text{h} \cdot \text{ft}^2 \cdot ^\circ\text{F}$) [$\text{W}/(\text{m}^2 \cdot \text{K})$].

VERTICAL FENESTRATION. Windows (fixed or moveable), opaque doors, glazed doors, glazed block and combination opaque/glazed doors composed of glass or other transparent or translucent glazing materials and installed at a slope of a least 60 degrees (1.05 rad) from horizontal.

SOLAR HEAT GAIN COEFFICIENT (SHGC). The ratio of the solar heat gain entering the space through the fenestration assembly to the incident solar radiation. Solar heat gain includes directly transmitted solar heat and absorbed solar radiation that is then reradiated, conducted or convected into the space.

VISIBLE TRANSMITTANCE [VT]. The ratio of visible light entering the space through the fenestration product assembly to the incident visible light, Visible Transmittance, includes the effects of glazing material and frame and is expressed as a number between 0 and 1.

Building Modeling and Verification Data

ENERGY ANALYSIS. A method for estimating the annual energy use of the *proposed design* and *standard reference design* based on estimates of energy use. – references below:

PROPOSED DESIGN. A description of the proposed *building* used to estimate annual energy use for determining compliance based on total building performance.

STANDARD REFERENCE DESIGN. A version of the *proposed design* that meets the minimum requirements of this code and is used to determine the maximum annual energy use requirement for compliance based on total building performance.

ENERGY SIMULATION TOOL. An approved software program or calculation-based methodology that projects the annual energy use of a building.

HOME ENERGY RATING SYSTEM (HERS). A home energy rating system approved by the Vermont Department of Public Service that provides a numerical rating in compliance with 30 V.S.A. § 52. The purpose of this procedure is to ensure that accurate and consistent home energy ratings are performed by accredited HERS providers in Vermont and to promote an objective, cost-effective, sustainable home energy rating process as a compliance method for residential building energy codes; as qualification for energy programs designed to reach specific energy-saving goals; and as a way to provide Vermont's housing market the ability to differentiate residences based on their energy efficiency.

RATED DESIGN. A description of the proposed *building* used to determine the energy rating index.

CONDITIONED FLOOR AREA. The horizontal projection of the floors associated with the *conditioned space*. See also *Finished Conditioned Floor Area*.

CONDITIONED SPACE. An area, room or space that is enclosed within the *building thermal envelope* and that is directly or indirectly heated or cooled. Spaces are indirectly heated or cooled where they communicate through openings with *conditioned spaces*, where they are separated from *conditioned spaces* by uninsulated walls, floors or ceilings, or where they contain uninsulated ducts, piping or other sources of heating or cooling. See also *Finished Conditioned Floor Area*.

FINISHED AREA. An enclosed area in a house that is suitable for year-round use, embodying walls, floors, and ceilings that are similar to the rest of the house.

FINISHED CONDITIONED FLOOR AREA (FCFA). The floor area in square feet of a home that is within the *conditioned space* of the building, and also is finished area, as measured in accordance with ANSI Standard Z765-2003 (with the exception that floor areas with ceiling heights of less than 5 feet will be included in finished square footage).

GROSS AREA OF EXTERIOR WALLS. The normal projection of all exterior walls, including the area of all windows and doors installed therein (see "Exterior wall").

OPAQUE AREAS. All exposed areas of a building envelope which enclose *conditioned space*, except openings for windows, skylights and building service systems. Doors are considered opaque when they are 50-percent or greater opaque in surface area.

DEGREE DAY, COOLING. A unit, based on temperature difference and time, used in estimating cooling energy consumption and specifying nominal cooling load of a building in summer. For any one day, when the mean temperature is more than 65°F, there are as many degree days as there are degrees Fahrenheit difference in temperature between the mean temperature for the day and 65°F. Annual cooling degree days (CDD) are the sum of the degree days over a calendar year.

DEGREE DAY, HEATING. A unit, based upon temperature difference and time, used in estimating heating energy consumption and specifying nominal heating load of a building in winter. For any one day, when the mean temperature is less than 65°F, there are as many degree days as there are degrees Fahrenheit difference in temperature between the mean temperature for the day and 65°F. Annual heating degree days are the sum of the degree days over a calendar year.

INFILTRATION. The uncontrolled inward air leakage into a *building* through the building thermal envelope caused by the pressure effects of wind or differences in the indoor and outdoor air density or both.

CUBIC FEET PER MINUTE (CFM). The quantity of air moved in 1 minute. A measurement typically applied to ventilation equipment.

THERMAL CONDUCTANCE, OVERALL (U_o). The overall (average) heat transmission of a gross area of the exterior building envelope. The U_o -factor applies to the combined effect of the time rate of heat flow through the various parallel paths, such as windows, doors and opaque construction areas, comprising the gross area of one or more exterior building components, such as walls, floors or roof/ceilings.

WINDOW PROJECTION FACTOR. A measure of the portion of glazing that is shaded by an eave or overhang.

RENEWABLE ENERGY SOURCES. Means energy produced using a technology that relies on a resource that is being consumed at a harvest rate at or below its natural regeneration rate including, but not limited to solar hot water, solar hot air, solar photovoltaics, wind, and hydro.

HIGH-EFFICACY LAMPS/ LIGHTING. Compact fluorescent lamps, light-emitting diode (LED) lamps, T-8 or smaller diameter linear fluorescent lamps, or lamps with a minimum efficacy of not less than 65 lumens per watt; or light fixtures of not less than 55 lumens per watt. In determining the number or percent of lamps, each replaceable lamp (or light string) connected to a permanently installed lighting fixture shall count as one lamp.

Mechanical Equipment

HVAC SYSTEM COMPONENTS. HVAC system components provide, in one or more factory- assembled packages, means for chilling or heating water, or both, with controlled temperature for delivery to terminal units serving the *conditioned spaces* of the building. Types of HVAC system components include, but are not limited to, water chiller packages, reciprocating condensing units and water source (hydronic) heat pumps (see "HVAC system equipment").

HVAC SYSTEM EQUIPMENT. HVAC system equipment provides, in one (single package) or more (split system) factory-assembled packages, means for air circulation, air cleaning, air cooling with controlled temperature and dehumidification and, optionally, either alone or in combination with a heating plant, the functions of heating and humidifying. The cooling function is either electrically or heat operated and the refrigerant condenser is air, water or evaporatively cooled. Where the equipment is provided in more than one package, the separate packages shall be designed by the manufacturer to be used together. The equipment shall be permitted to provide the heating function as a heat pump or by the use of electric or fossil-fuel-fired elements. (The word "equipment" used without a modifying adjective, in accordance with common industry usage, applies either to HVAC system equipment or HVAC system components.)

POWER-VENTED APPLIANCE. Appliances that operate with a positive vent static pressure (Category III) and utilize a mechanical fan to exhaust combustion gases from the appliance to the outside atmosphere.

WHOLE HOUSE MECHANICAL VENTILATION SYSTEM. An exhaust system, supply system, or combination thereof that is designed to mechanically exchange indoor air with outdoor air when operating continuously or through a programmed intermittent schedule to satisfy the whole house ventilation requirements.

MECHANICAL VENTILATION. The mechanical process of supplying conditioned or unconditioned air to, or removing such air from, any space by powered fans. For purposes of this standard, mechanical ventilation does not include processes driven by wind, such as turbine ventilators.

LOCAL VENTILATION. A mechanical ventilation system including fans, controls and ducts, dedicated to exhausting moisture-laden and/or contaminated air to the outside of the building from a room or space in which the moisture or contamination is generated or supplying outdoor air to that space.

WHOLE HOUSE VENTILATION SYSTEM, BALANCED. Balanced systems provide outdoor air for ventilation such that supply and exhaust air quantities are of equal capacity to achieve pressure equalization, such as heat recovery ventilator, an air-to-air heat exchanger or any other system that is designed to provide mechanical supply as well as mechanical exhaust.

WHOLE HOUSE VENTILATION SYSTEM, EXHAUST ONLY. Exhaust only systems exhaust stale indoor air via a single fan, multiple fans or the installation of dual-purpose fans (i.e., serving both localized and whole house ventilation functions). Fresh incoming air may be provided by installed inlet ports or from typical leaks in the building envelope. Exhaust only systems may depressurize the indoor environment.

WHOLE HOUSE VENTILATION SYSTEM, MULTI-PORT. A whole house ventilation system that has more than one exhaust or supply port inside the house.

WHOLE HOUSE VENTILATION SYSTEM, SINGLE-PORT. A whole house ventilation system that has only one connection to the *conditioned space* and one connection to outdoor air.

ENERGY RECOVERY VENTILATION SYSTEM (ERV). Systems that employ air-to-air heat exchangers to recover sensible and latent energy from exhaust air for the purpose of preheating, precooling, humidifying or dehumidifying outdoor ventilation air prior to supplying the air to a space, either directly or as part of an HVAC system.

HEAT RECOVERY VENTILATION SYSTEM (HRV). A factory-assembled device or combination of devices, including fans or blowers, designed to provide outdoor air for ventilation in which heat is transferred between two isolated intake and exhaust air streams.

RATED CAPACITY. In terms of ventilation, the volume of air (in cfm) that the fan can move against a given static pressure (in inches or water gage). Prescriptive compliance with the *Vermont Residential Building Energy Standards* requires that all fan capacities be rated at 0.1 inch (25 Pa) of water gage.

HEAT PUMP. A refrigeration system that extracts heat from one substance and transfers it to another portion of the same substance or to a second substance at a higher temperature for a beneficial purpose.

COLD-CLIMATE HEAT PUMP. A heat pump with an inverter-driven, variable capacity compressor that is designed to provide full heating heat pump capacity and having a minimum COP of 1.75 or greater at an outside air temperature of 5°F.

HEAT PUMP WATER HEATER. A water heater that uses electricity and a refrigeration cycle to move heat from the ambient air to heat water instead of directly heating water.

HEATING SEASONAL PERFORMANCE FACTOR (HSPF). The total heating output of a heat pump during its normal annual usage period for heating, in Btus, divided by the total electric energy input during the same period, in watt hours, as determined by DOE 10 CFR Part 430, Subpart B, Test Procedures, and based on Region 4.

COEFFICIENT OF PERFORMANCE (COP)—HEAT PUMP—HEATING. The ratio of the rate of heat delivered to the rate of energy input, in consistent units, for a complete heat pump system under designated operating conditions. Supplemental heat shall not be considered when checking compliance with the heat pump equipment.

SEASONAL ENERGY EFFICIENCY RATIO (SEER). The total cooling output of an air conditioner during its normal annual usage period for cooling, in Btu/h, divided by the total electric energy input during the same period, in watt-hours, as determined by DOE 10 CFR Part 430, Subpart B, Test Procedures.

SEALED COMBUSTION VENTING SYSTEM. A venting system designed so that all air for combustion is derived directly from the outside atmosphere and all flue gases are discharged directly to the outside atmosphere. (See also "Direct-vent Appliances.")

SEASONAL ENERGY EFFICIENCY RATIO (SEER). The total cooling output of an air conditioner during its normal annual usage period for cooling, in Btu/h, divided by the total electric energy input during the same period, in watt-hours, as determined by DOE 10 CFR Part 430, Subpart B, Test Procedures.

SENSIBLE RECOVERY EFFICIENCY (SRE). The net sensible energy recovered by the supply airstream as adjusted by electric consumption, case heat loss or heat gain, air leakage, airflow mass imbalance between the two airstreams and the energy used for defrost (when running the Very Low Temperature Test), as a percent of the potential sensible energy that could be recovered plus the exhaust fan energy.