



**Key Features of Airtight/Superinsulated Construction** (using an Interior-Strapped Wall)

The purpose of special framing details and air-sealing is to ensure quality control in obtaining a tightly-built envelope that is certifiable by blower-door pressure testing. Mechanical ventilation, in the form of an air-to-air heat exchanger or heat-recovery ventilator (HRV), is required to ensure good indoor-air quality and occupant comfort. The use of sealed-combustion direct-vent appliances is also required. Any wood-burning appliances need gasketed doors and dedicated outside combustion-air. Construction is similar to conventional 2x6 construction with a few differences. These primarily involve inserting vapor-barrier strips in critical floor/wall/roof intersections during rough framing. The interior-strapping is added after rough framing is completed. The resulting additional 1-1/2" wall thickness must be taken into account for window & door casings, as well as any dimension-dependent installations along the exterior walls. These might include stairs, plumbing fixtures, and/or other building elements.

The illustration above represents a typical interior-strapped wall. The darkest patterns indicate the reduced areas of solid wood, which provides a thermal break between the inside and outside surfaces of the wall. This reduces the 15-25% solid content of standard 2x6 framing to around 7%, due to insulation over much of the interior surface of the studs and behind the strapping, along with less solid framing at plates, around openings and at corners.

Some key features of this type of construction are listed below:

**Foundation/Basement:**

- sealed vapor-barrier below slab, above or below rigid insulation
- rigid insulation below slab w/optional sand bed for protection
- optional sub-slab radon-mitigation gravel bed below vapor-barrier
- interior 2x4 insulated perimeter stud wall, set in 1-1/2" from foundation wall, OR
- PREFERRED: R-10 rigid interior XPS w/1x3 furring for interior drywall finish
- wall vapor-barrier sealed to sub-slab & rim-joist vapor-barrier
- electrical boxes mounted in plastic vapor-barrier surrounds or gasketed

**Floor Deck:**

- vapor-barrier strip laid over wider sill plate prior to setting joists
- rim-joist recessed 5-1/2" to allow insulated exterior walls to rest on sill plate, or
- rim-joist recessed 2" to allow for rigid insulation outside box sill
- vapor-barrier strip folded up & over subfloor to allow for continuity with wall vapor-barrier

**Walls:**

- window & door unit frames wrapped with vapor-barrier strip prior to installation
- wall vapor-barrier sealed to rim joist & ceiling/upper floor vapor-barrier
- wall vapor-barrier sealed to window & door vapor-barrier wrapping
- 2x2 horizontal strapping across interior face of studs to create thermal break/7" cavity
- 2x4 horizontal strapping @ base and @ mid-height for base & drywall attachment
- vapor-barrier strip inserted behind end stud of partitions intersecting outside wall
- electrical boxes mounted in plastic vapor-barrier surrounds or gasketed
- 1x3 furring over housewrap @ exterior for wood-siding rain-screen/drying cavity

**Upper Floor Deck:**

- vapor-barrier strip laid over wall top plate prior to setting joists
- rim-joist recessed 2" to allow for rigid insulation outside box sill
- vapor-barrier strip folded up & over subfloor to allow for continuity with wall vapor-barrier

**Ceiling/Roof Truss:**

- raised-heel energy trusses or raised-plate platform framing for flat ceilings
- raised-heel scissors-trusses, parallel-chord trusses, or false drop-rafters for sloped ceilings
- vapor-barrier strip inserted at all roof/wall framing intersections
- vapor-barrier sealed to wall vapor-barrier

**Interior Strapped-Wall**

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**TYPICAL DETAILS**