

Residential Basement Finish Guide

Contractor Licenses allowed to finish residential basements:

A, B, B(DR) C1, C2, D1, D2, D(DR), E(residential).

Homeowner builders see: homeowner affidavit

Finishing a basement requires a permit.

Required Inspections

| | | |
|------------------------------|---|-------------------------------|
| Underground Plumbing | only for under slab plumbing (no existing rough-ins) | |
| Rough Inspections | Gas line air test (if new/alterd) | Can all be scheduled same day |
| | Plumbing top out and water test | |
| | Rough mechanical (ductwork) | |
| | Rough electrical (wiring) | |
| | Fireplace (if applicable) | |
| | Rough Frame (fire blocking installed) | |
| Insulation Inspection | Do not install drywall until this inspection is passed. | |
| Finals | Final Inspections (schedule each): Plumbing, Electric, Mechanical, Final Building. | Can all be scheduled same day |

Submittal Checklist

(All documents must be in PDF format)

- Permit Application:** Name PDF: *Apps – Address – v1*
Include square footage of areas to be finished, and areas to remain unfinished
 - Homeowner Affidavit
- Plans:** Name PDF: *Plans – Address – v1*
 - Proposed Floor Plan
 - Fire sprinkler re-design (if fire sprinkler system is present and being modified or needs to be modified due to layout/framing changes) see notes 2&3 below
- Payment** (due at permit issuance)

Check before submitting:

1. Engineered and stamped structural plans or letter are required to be submitted for any of the following conditions:

- A. Installation of a new window in an existing foundation wall, or altering a foundation wall (i.e. basement dig-out)
- B. Adding a beam, column, new footers.

2. If the *entire* house/unit is currently fire sprinkled, contact buildingdocs@fcgov.com prior to applying for a permit.

Our Building Code Plan Review Team can research your property and type of fire sprinkler system. A sprinkler design will need to be submitted to Poudre Fire Authority or Building Services depending on the system type.

3. If the *basement only* is fire sprinkled in a *single family detached house* (remaining house is not sprinkled):

Single family detach homes permitted after 2/17/2014 require ½" drywall on the bottom of engineered floor joists or joists smaller than 2x10. Alternately code allows for a partial sprinkler system only in the basement per the plumbing code to serve as floor joist protection. If only the basement is sprinkled, you may remove the heads in areas where the ceiling will be finished with ½" min. drywall, or include a new sprinkler design with the submittal. In two-family, townhome or multi-family unit, the fire sprinkler system CANNOT be removed (see note above).

4. Can I get a permit for work done by a prior owner who finished the basement without a permit?

Work started or completed without a permit is in violation of Building and Municipal Codes and typically subject to penalties, however, if you purchased a property with unpermitted work, we are happy to work with you to permit and bring the space into compliance without fines. Please contact us for more information on this process.

5. Will the basement include a second kitchen? Or converting the basement to a second unit (duplex/two family)?

See: [Land use code definition of kitchen](#). Contact zoning for feasibility: zoning@fcgov.com

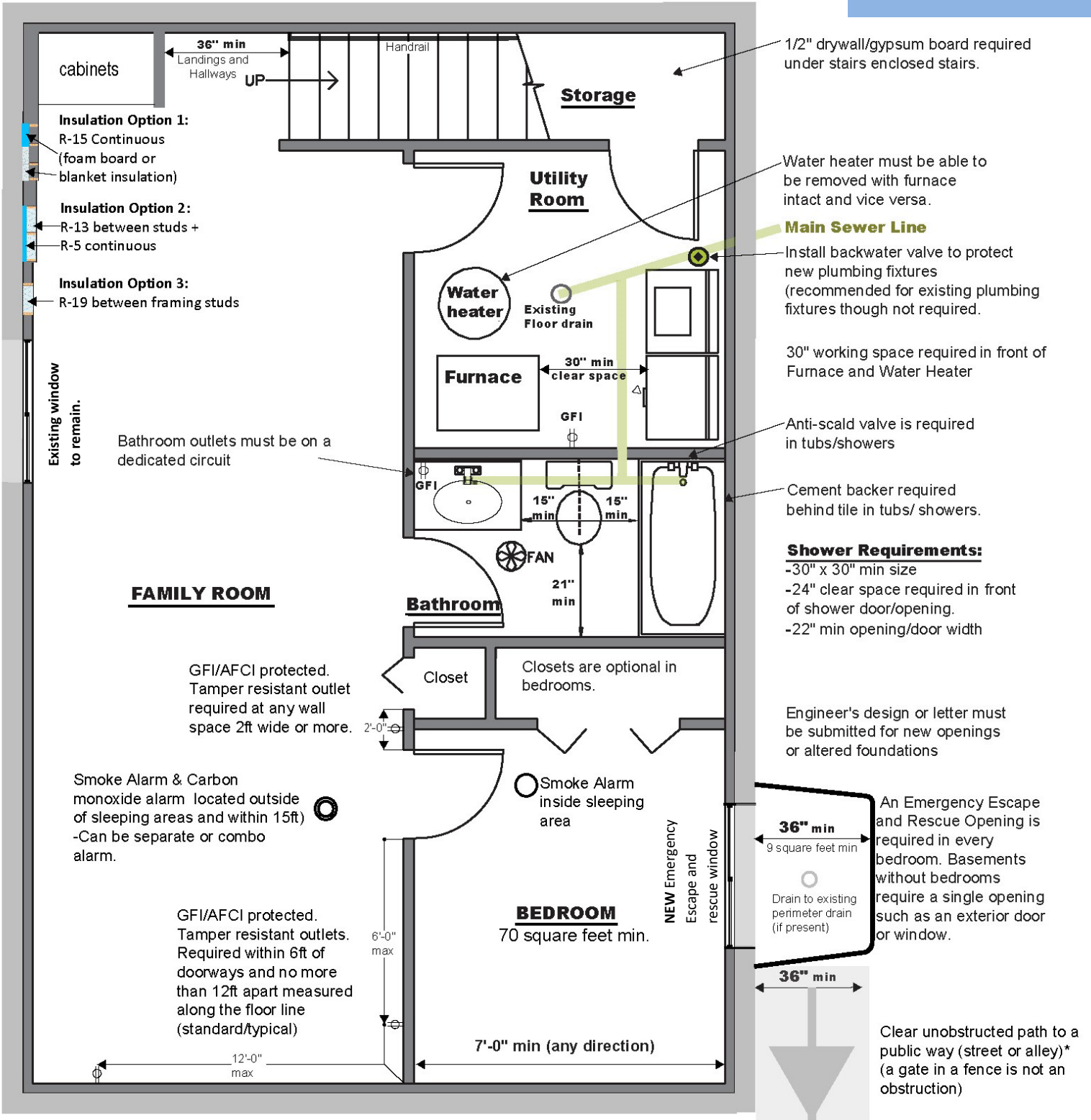
6. Considering a short-term rental?

Check feasibility: <https://www.fcgov.com/shorttermrentals/>

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Floor Plan

Draw a floor plan like the one below (min requirements are shown in this drawing for reference):



*Indicates 2021 code changes

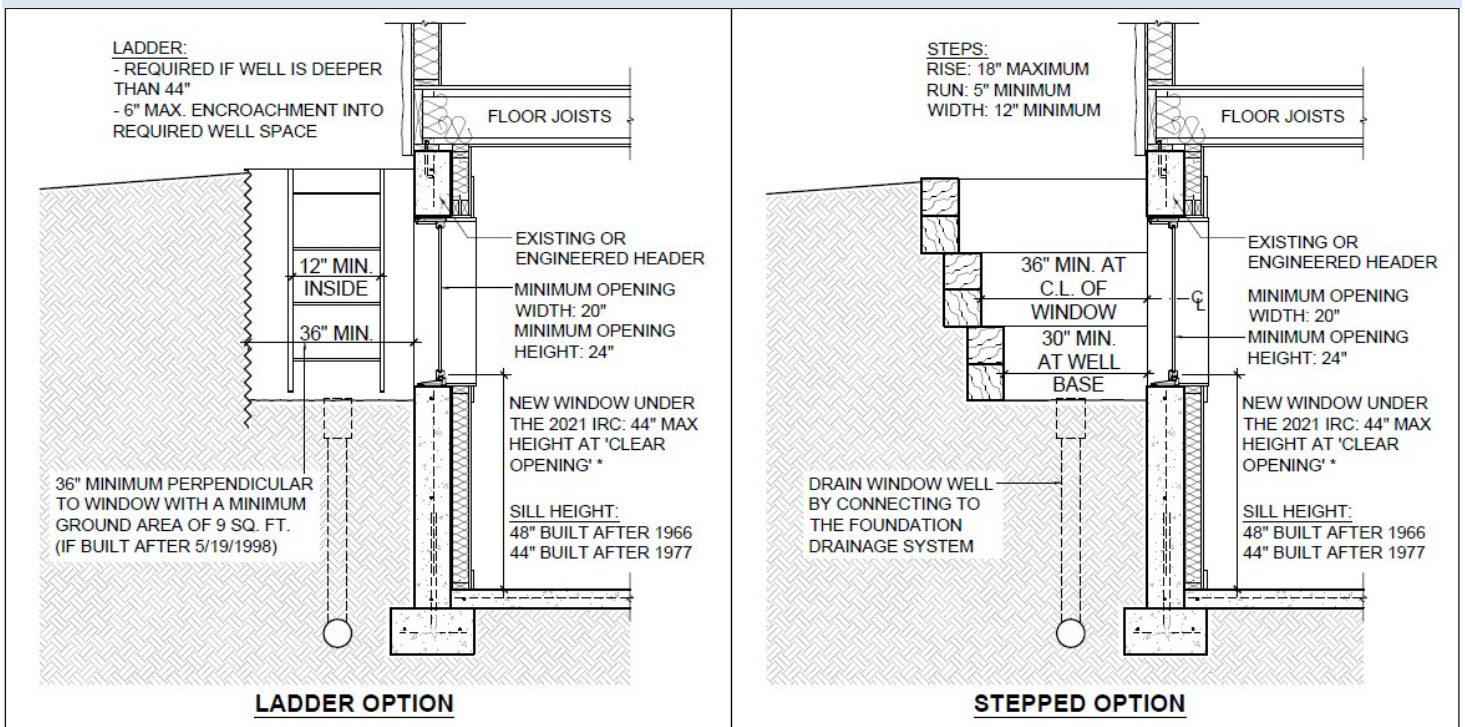
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| Design and Construction Checklist | | View Codes and Amendments: http://www.fcgov.com/building/codes |
|--|--|---|
| Fire and Life Safety | | An emergency escape and rescue opening is required in every bedroom. <i>Label as new or existing on plans.</i> |
| | | Smoke detectors are required inside and outside all sleeping areas, on each level, and shall be connected to the existing detection system if present. If no interconnected smoke detector system is currently present, battery-operated, and wireless smoke detectors are acceptable. |
| | | A carbon monoxide alarm is required outside, and within 15 feet of the bedroom, and inside bedrooms with fueled fireplaces (gas, wood burning, pellet). |
| | | Enclosed useable space under the stairs shall be fully protected by min ½" gypsum board (drywall) |
| | | Provide fire blocking in framed walls at ceilings, and furred walls at 10' intervals (at rough frame Inspection). |
| | | Access to mechanical rooms shall not be located within, or open into a bedroom or bathroom. Exceptions: <ul style="list-style-type: none"> a) Access door is solid (i.e.: no louvres), gasketed, self-closing door, and combustion air is taken directly from the outdoors into the mechanical room. b) All appliances are sealed combustion, direct vent appliances. c) Home is all electric (no gas appliances). |
| Space | | Minimum ceiling height is: 7'-0" for bedrooms, living areas and hallways. 6'-8" for: showers, storage rooms, & laundry rooms. 6'-4" min at locations of ductwork and existing beams. |
| | | Minimum bedroom size is 70sf and not less than 7ft in width/length. |
| Frame | | Pressure preservative treated lumber for wall bottom plates in contact with concrete. |
| | | <i>Floating walls are allowed but not required</i> |
| Insulation/windows | | Existing wall framing cavities (along exterior walls) exposed during construction shall be filled with insulation. Uninsulated foundation walls: shall be insulated per options below: <i>Option 1: R-15 continuous (i.e. blanket or foam board insulation) *</i> <i>Option 2: R-13 between studs + R-5 continuous (between wall framing and foundation or on face of studs) *</i> <i>Option 3: R-19 between framing studs *</i> |
| | | Exposed Rim joists not currently insulated shall be insulated with R-30 Batt or R-15 spray foam. |
| | | Label all new/replaced windows. Energy requirements for windows: U = 0.28 max and SHGC = 0.35 max |
| Electrical | | Arc fault protection (AFCI), GFCI protection, and tamper resistant receptacles are required for all basement outlets including wet bars and after-the-fact basement finishes. Exception: Bathroom outlets do not require AFCI protection. |
| | | Electric outlets in habitable rooms shall be installed at any wall space 2ft wide or more, within 6ft of any door/opening in the wall and at intervals not to exceed 12ft, between receptacles, measured horizontally along the floor/wall line. |
| | | Bathroom outlets require a dedicated 20 Amp GFCI circuit |
| Ventilation | | Provide mechanical room with combustion air. See attached Combustion Air Chart on page 5 of this handout |
| | | Bathrooms shall be provided with an exhaust fan ducted to the exterior of the house or an operable window |
| | | Natural ventilation is required for all habitable rooms (windows, doors, etc.) The openable area shall be 4% min of the floor area of that room. |
| | | Homes with forced air heating/cooling require a supply + return air path to each habitable room (no door undercuts). |
| Firepla | | Any fireplace or heating equipment shall be installed in accordance with the manufacturer's specifications. |
| | | Separate permits shall be required for solid fuel (wood or pellet) burning appliances |
| Plumbing | | New plumbing fixtures in basements, shall be protected by an approved backwater valve. (Recommended, but not required for existing basement fixtures including floor drains, etc.) |
| | | Low flow plumbing fixtures are required: Standard Toilet: 1.28 gpf * Dual Flush Toilet: The average of 3 flushes (2 low and 1 standard) must = 1.28 gpf or less* ; Shower Head: 1.8 gpm; Faucet: 1.5 gpm. |

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Emergency Escape and Rescue Openings

Emergency Escape and Rescue Opening code requirements have changed over the years in different versions of code with added safety considerations. Windows installed/built under older codes are still considered code compliant, however current requirements provide a nominal size to allow for escape and firefighter access. *Emergency Escape and Rescue Openings* can be either doors or windows. Emergency Escape and Rescue *windows* are sometimes referred to as “egress windows” though this is not a term used in code.



1. Fall protection is required for new window wells adjacent to doors and walking surfaces.
2. A net clear opening of 5.0 square feet is required for new emergency escape and rescue windows at or below grade.
3. New window well installation shall be designed for drainage and connected to the building’s foundation drain (if present). *
4. Replacement windows shall have the same operation and same clear opening size or larger but not less than 22 inches high, 20 inches wide *and* 4 square feet minimum net clear opening. *
5. Re-using of an existing window for an emergency escape will need to meet #4 and the sill height/window well depth for egress standards at time of install. (i.e. If the house was built 1966-1977, the max sill height should be 48 in., but window well depth of 36” and 9 sq. ft. was not required at that point in time). View history of egress windows [here](#) *
6. New window wells require an unobstructed clear path to the public way (sidewalk/street). Window wells in a series may provide a metal grate window well cover, gates in a fence are permissible. *

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Combustion air

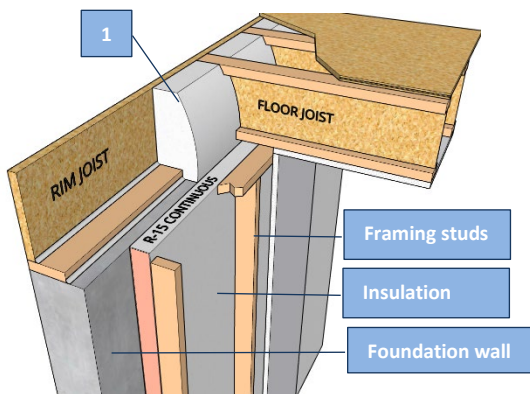
If a basement finish includes enclosing or making a smaller mechanical room that contains a gas appliance that is not directly vented with sealed combustion, then combustion air shall be confirmed/ provided per this chart.

Minimum Outside Combustion Air for needed for non-direct vent gas appliances (furnaces).

| BSMT FINISH GAS APPLIANCE (FURNACE) COMBUSTION AIR CHART | | | |
|--|-----------|--|---|
| METHOD | CODE | DESCRIPTION | REQUIREMENTS |
| I | G2407 | INDOOR COMBUSTION AIR | Standard Method (Older/existing houses, pre 1975) - 50 cu.ft. per 1000 btu. |
| II | G2407.8 | ENGINEERED SYSTEM | Per submitted and engineered. |
| III | G2407.9 | MECHANICAL COMBUSTION AIR | .35 cu.ft. per min/1000 btu |
| IV | G2407.6.1 | OUTDOOR COMBUSTION AIR, 2 ROUND SUPPLY DUCTS | 2 permanent opening method: 1 high & 1 low; vertical ducts provide 1 sq. in. per 4000 btu; horizontal ducts provide 1 sq. in. per 2000 btu. |
| V | G2407.6.2 | OUTDOOR COMBUSTION AIR, 1 ROUND SUPPLY DUCT | One permanent opening method: provide 1 sq.in. per 3000 btu. See below. 34,000=4" DUCT , 55,000=5" DUCT, 80,000=6" DUCT, 110,000=7" DUCT, 145,000=8" DUCT, 185,000=9" DUCT, 230,000=10" DUCT. |
| VI | | ALL APPLIANCES ARE DIRECT VENT | All combustion air taken directly to appliance therefore no duct into appliance location necessary. |

Insulation

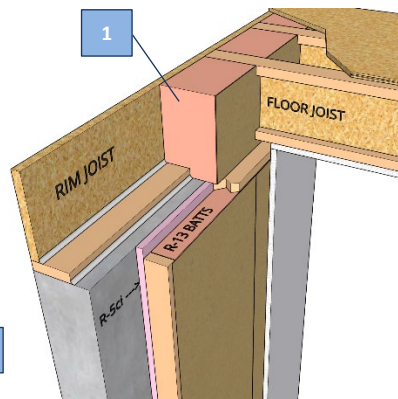
- Homes with currently insulated basements can retain insulation in-place (I.E.: blankets etc. installed when home was built)
- Remodel/after-the-fact: Must fill any cavities that are currently exposed or become exposed during construction.
- Unfinished basements with no insulation are required to meet one of the following:



Option 1: R15 Continuous *

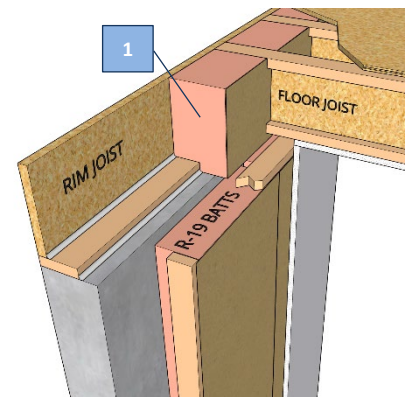
Continuous insulation can be:

- Batt/Blanket
- Or rigid foam board



Option 2: R13 + 5 Continuous *

- R13 between wood studs AND
- R5 Continuous insulation either between foundation wall and framing or between framing and drywall (typically rigid foam board is used).



Option 3: R19 *

R19 Insulation between framing studs.

- Spray foam
- Batt (do not compress insulation)
- Blown-in, provided the wall thickness can accommodate R19
- Rigid Foam

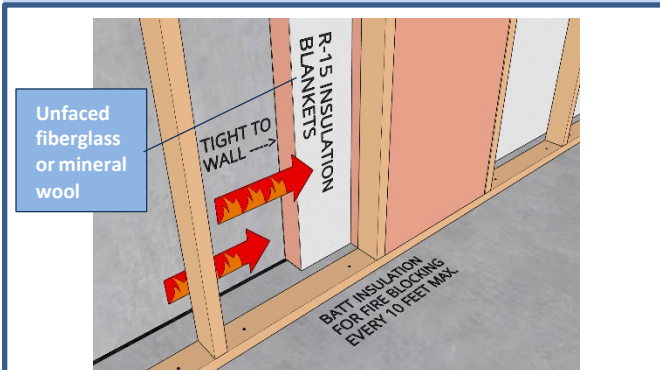
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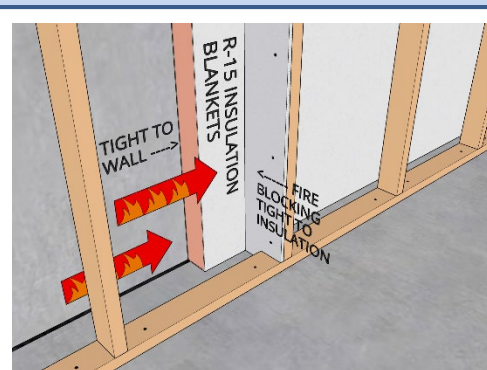
Fire Blocking

Unfaced Fiberglass Insulation used for Fire Blocking

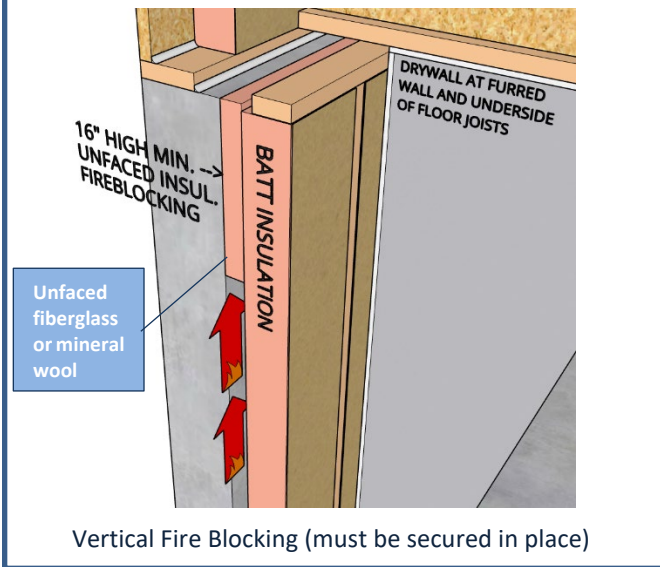


Horizontal Fire Blocking (every 10ft)

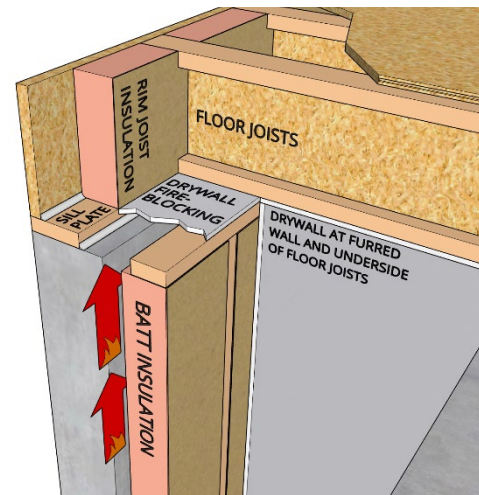
Drywall, Lumber, Plywood used for Fire Blocking



Horizontal Fire Blocking (every 10ft)

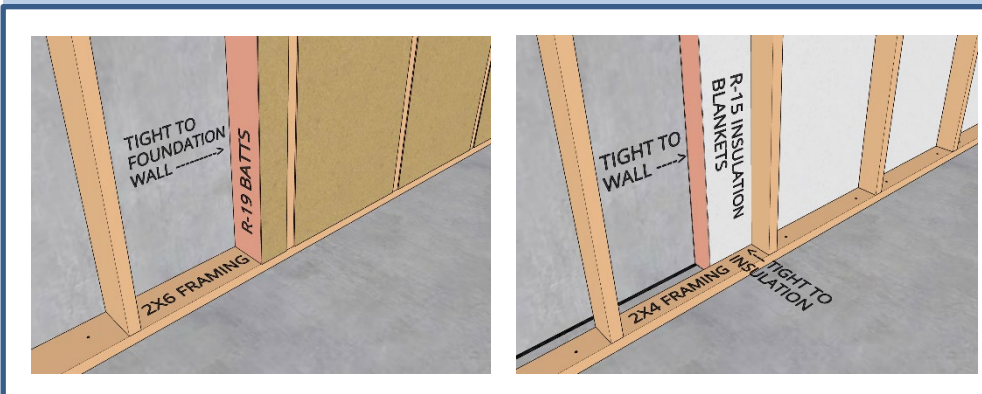


Vertical Fire Blocking (must be secured in place)

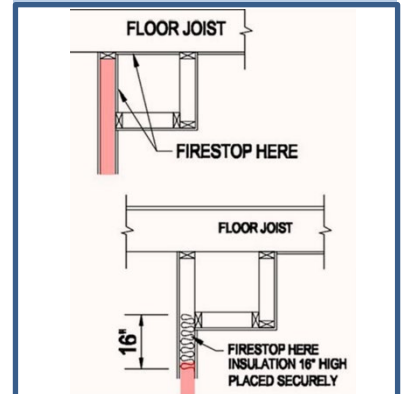


Vertical Fire Blocking (over top plates)

No Fire Blocking is required when wall is framed flush to the foundation



Soffit Fire Blocking



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