BASEMENT FINISH REQUIREMENT GUIDE

Current Codes:

2021 International Residential Code
2018 International Energy Conservation Code
2023 National Electrical Code

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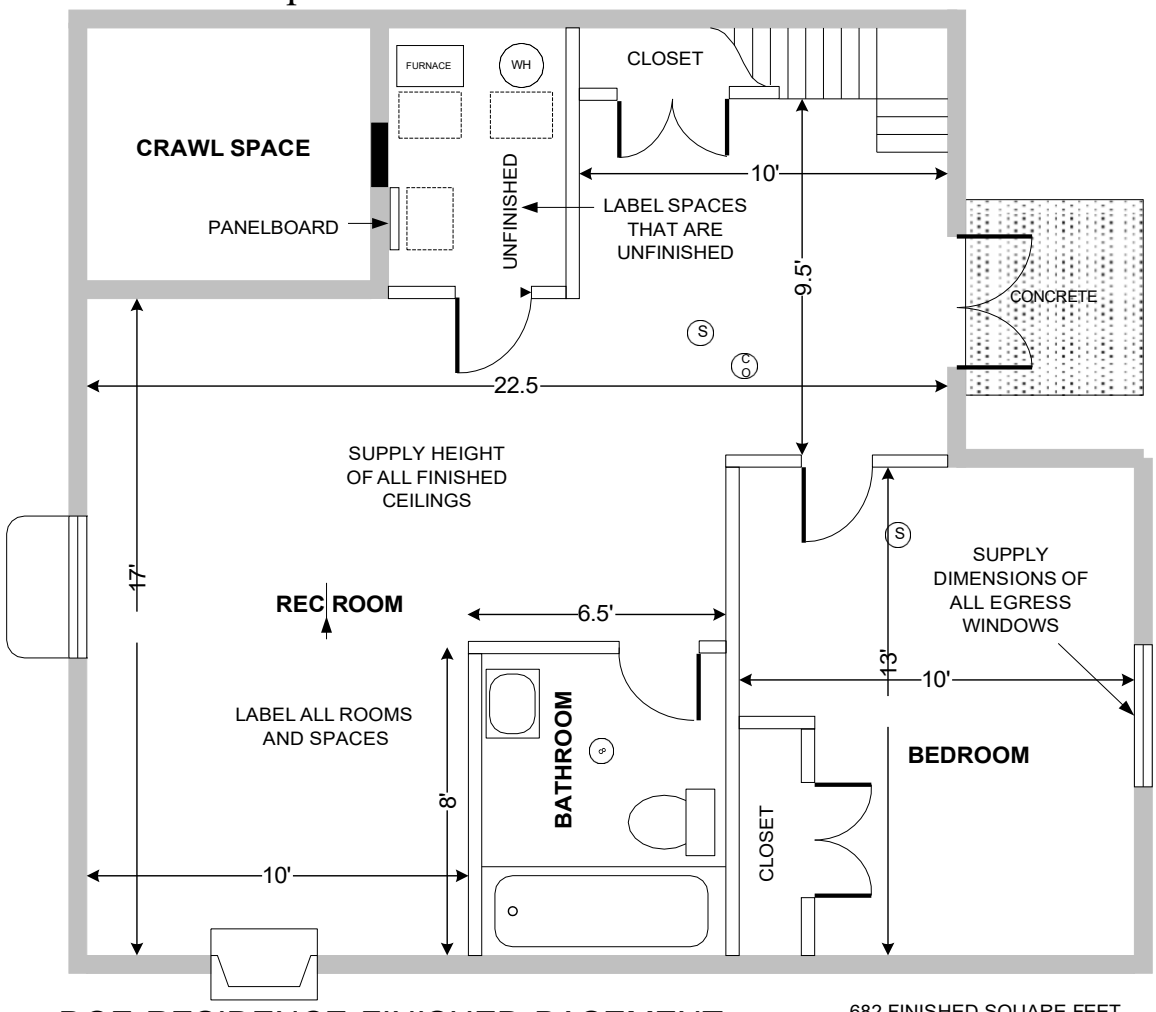
Helpful Hint: You may obtain permits in your own name; however, if a contractor is to perform the work, the contractor shall obtain the permit and be listed as the responsible party. In this way, Douglas County will be in a better position to assist you in gaining compliance with codes if the work is defective. A contractor shall be properly registered and insured in order to obtain a permit.

Please note, if your project requires a trash dumpster or roll-off trash containers, it must be placed on your property or on your driveway. Trash dumpsters and roll-off trash containers are not permitted to obstruct a sidewalk or be placed on any public roadway.

SAMPLE OF DRAWING REQUIREMENTS

- Plans shall be drawn to a scale of 1/4" (1/4" = 1') on white paper in blue or black ink and shall include room dimensions.
- Plans shall show the location of the furnace, water heater, stairs and all existing windows (including sizes).
- Label the intended use of all rooms, unfinished areas and make note of the total finish and unfinished square footage.
- Please note on the drawings if you have a septic system. Douglas County Health Department approval is required if you are adding a bedroom.
- Where fire suppression is required, Fire Department review shall be required for submittal.



SEQUENCE OF INSPECTIONS

This is a list of the most common inspections that are required for a typical basement finish. Some of the listed inspections may not be applicable to your project. Additional inspections may be required for other less typical projects.

Underground Plumbing (or under floor)
This inspection is performed when the base plumbing drainage system is in place. The inspection shall be approved prior to placement of concrete or floor sheathing. The system shall be tested at the time of the inspection with water, or five pounds of air pressure shown on a 30 p.s.i. gauge, or a flow test may be performed at time of inspection. All plumbing under structural floors shall be suspended a minimum of three inches above the ground to allow for soil expansion.

Electrical Slab Inspection
This inspection is required when electrical conduits are installed under any concrete prior to placement of concrete. This inspection is required for electrical in-floor heating cables under tile or concrete.

Rough Electric
This inspection is to be performed when all the wire and boxes have been installed. Grounds and neutrals shall be "made up" at the boxes and home runs completed to the panel location. No devices (outlets, switches) shall be installed at this time. All low voltage system wiring (specialty lighting, telephone, data, cable, security, etc.) shall be installed at the time of the Rough Electric Inspection.

Rough Frame
This inspection is performed once all the framing, plumbing, and mechanical rough-ins are completed. This inspection may be requested on the same day as the Rough Electric but cannot be requested before requesting a Rough Electric inspection.

Interior Gas Line
This inspection is typically performed at the same time as the Rough Frame inspection. The piping system shall be completed and tested with a 10-pound air test on a maximum 30-pound gauge, unless alternative piping is used.

Insulation
This inspection is performed after the basement is insulated and vapor retarders are installed where required. The insulation shall be a minimum of an R-19 in the frame cavities or a continuous blanket of R-15.

Shower Pan
“Built in place” shower bases shall be sloped and lined in accordance with the code and filled with water. This inspection is typically requested at the same time as the drywall inspection.

Drywall
This inspection is performed after all the drywall is in place and fastened per code, prior to beginning drywall tape and finishing. Metal trim (corner bead) may be installed prior to inspection but is not required.

Final Electric
This inspection is performed when all electrical outlets, lights and switches with cover plates are installed. The electrical panel shall be complete, and circuits properly labeled and appliances that are required to be hardwired must be installed.

Final Building
This inspection is performed when all life safety items have been completed and the basement finish is completed in accordance with the approved plans.

GENERAL BUILDING REQUIREMENTS

Room Sizes

Habitable rooms shall have an area not less than 70 sq. ft. and shall not be less than 7’-0” in any horizontal dimension.

Hallways

Hallways shall not be less than 36” in width, finished.

Ceiling Heights

Habitable rooms, hallways, and corridors shall have a ceiling height of not less than 7’. Bathrooms, toilet rooms and laundry rooms shall have a ceiling height of not less than 6’-8”. Beams, girders, ducts and other obstructions shall not project to within 6’-4” of the finished floor.

Bathroom Ventilation

Bathrooms and toilet rooms shall be mechanically vented directly to the outdoors at a minimum rate of 50 c.f.m. by means of a duct with a minimum 4” diameter. Mechanical ventilation is not required when a window is provided with minimum operable opening of 1.5 sq.ft.

Stairway

- Basement stairs shall be provided with a means to light the treads and landings of the stairs. There shall be a switch to the light at the top and bottom of the stairs on stairs with 6 risers or more.
- Minimum head clearance from the nosing of the stair treads to the finished ceiling shall not be less than 6’-8”.
- The maximum riser height shall be 7 3/4” with a minimum tread depth of 10” plus nosing or 11" without nosing.
- A continuous and graspable handrail on one side of the stair is required to extend for the full length of the flight. The handrail shall be between 34”-38” measured vertically from the sloped plane of the treads.

- Guards shall be located along open-sided walking surfaces, including stairs, ramps and landings that are located more than 30” measured vertically to the floor below.

Under-Stair Protection

Enclosed space under stairs that is accessed by a door or access panel shall have walls, under-stair surface and any soffits protected on the enclosed side with 1/2” gypsum board.

Smoke Alarms

- Shall be installed on each floor, in each bedroom, outside the immediate vicinity of the bedrooms, and not less than 36” from the door or opening to a bathroom with a bathtub or shower.
- New smoke alarms shall receive their primary power from building wiring (120 volt, with battery backup) and be interconnected so that when one is activated, all will sound.
- Smoke alarms shall be interconnected by hardwire, or radio frequency wireless.
- Shall not be located within 36” of environmental air vents (supply and return) or ceiling fans.
- Shall follow manufacturer’s specifications for location near ceiling fans.
- **When finishing a basement, or when one or more sleeping rooms are added or created in existing dwellings, the dwelling shall be equipped throughout with smoke alarms located as required for new dwellings.**

Carbon Monoxide Alarms

- Where work requiring a permit occurs inside existing dwellings that have attached garages or fuel fired appliances, carbon monoxide alarms shall be provided.
- Carbon monoxide alarms shall be installed within 15’ of the entrance to all bedrooms throughout the home.

- Carbon monoxide alarms shall plug into a dwelling's electrical outlet and have a battery backup or be hardwired into the dwelling's electrical system and have a battery backup.
- Carbon monoxide alarms may be combined with a smoke alarm device if the combined device complies with applicable law (HB 09-1091) regarding both smoke alarms and carbon monoxide alarms and that the combined unit produces an alarm, or an alarm and voice signal, in a manner that clearly differentiates between the two hazards.

Basement Exterior Wall Insulation

Insulation is required to be a minimum of R-15 continuous blanket insulation or a minimum of R-19 batt insulation in all the stud cavities for the full height and length of the basement wall and crawl spaces. The vapor barrier, either the manufacturers kraft paper, or a clear 4 mil thickness polyethylene plastic sheet, shall be installed on the 'warm in winter' side of the wall (behind drywall).

1. Mechanical Rooms with outside combustion air: When only part of the basement is being finished and the conditioned space shares one or more common walls with the mechanical room, the mechanical room shall be insulated in accordance with IECC Section R402.4.4
2. Basements with existing insulation previously provided by the builder that is a minimum R-11 for below grade walls with continuous insulation or R-15/19 for above grade frame walls on a walk-out or garden level will be accepted without requiring additional insulation. Mechanical rooms with outside combustion air shall comply with IECC Section R402.4.4

EMERGENCY EGRESS REQUIREMENTS

Where Required

Emergency egress is required for all finished basements regardless of when the house was originally constructed. Emergency egress is also required in all basement bedrooms. However, basements with bedrooms are only required to have emergency egress in the bedrooms.

If your basement does not currently have one of the emergency egress options listed below, then you shall provide one. **Cutting openings in existing basement walls is outside the scope of these details. Therefore, a stamped structural engineered plan submission will be required for the new openings.** Douglas County will allow the use of pre-existing window wells with a horizontal projection of 24”, if all other egress conditions are met.

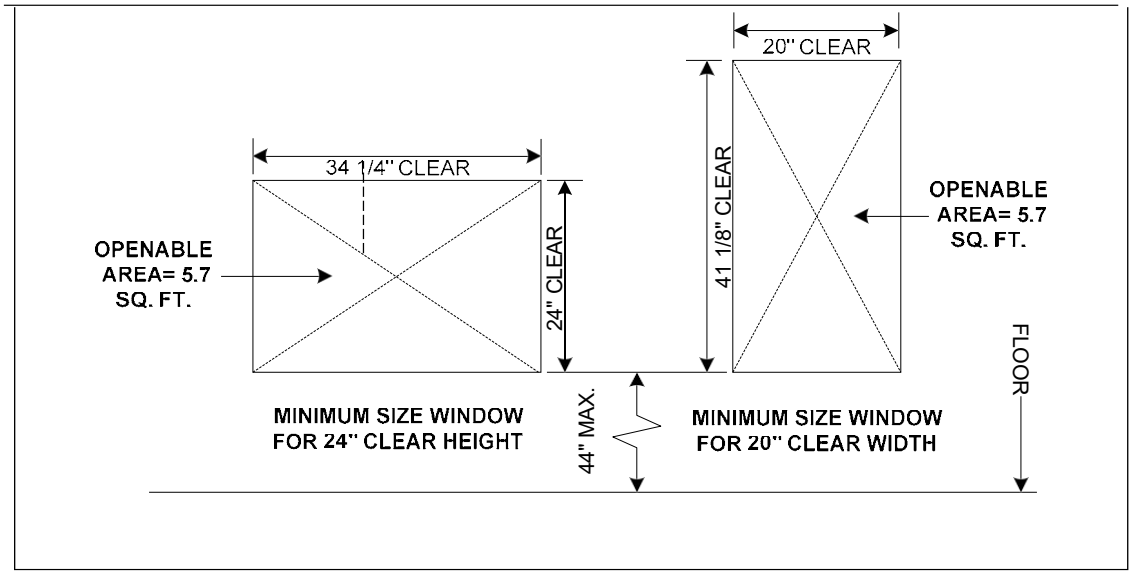
Emergency Egress Options

- Escape window opening directly to the outside (walk-out basement condition).
- Escape window opening into a window well.
- Door opening directly to outside (walk-out basement condition).
- Door opening to bulkhead enclosure.

Requirements

- All doors and windows utilized as emergency egress shall be operated from the inside without the use of keys, tools, or special knowledge.
- All emergency egress windows shall provide a minimum clear opening of 5.7 sq. ft.
- An existing operable window may be used if it provides a minimum net clear opening of 4 sq. ft. and a minimum clear opening of 22" x 20".

- Minimum clear openable window height of not less than 24”
- Minimum clear openable window width of not less than 20”
- Windows shall have the bottom of the clear opening not greater than 44" above the finished floor.
- See FIGURE 1 for more opening requirements.



Minimum width and height requirements for an egress window opening to meet 5.7 sq.ft.

Width	20	20.5	21	21.5	22	22.5	23	23.5	24	24.5	25	25.5	26	26.5	27	27.5	28	28.5	29	29.5	30	30.5	31	31.5	32	32.5	33	33.5	34
Height	41	40.0	39.1	38.2	37.3	36.5	35.7	34.9	34.2	33.5	32.8	32.2	31.6	31.0	30.4	29.8	29.3	28.8	28.3	27.8	37.4	26.9	26.5	26.1	25.7	25.3	24.9	24.5	24

FIGURE 1: Opening Requirements

Window Well Requirements

When grade conditions require the bottom of the clear opening of the egress windows to be below the outside grade elevation, then a window well shall be constructed. The required horizontal area of a window well shall be 9 sq. ft. with a minimum horizontal projection and width of 36”. The area of the window well shall allow emergency escape and rescue opening to be fully opened. Covers shall be openable without the use of a key or tool. See FIGURE 2.

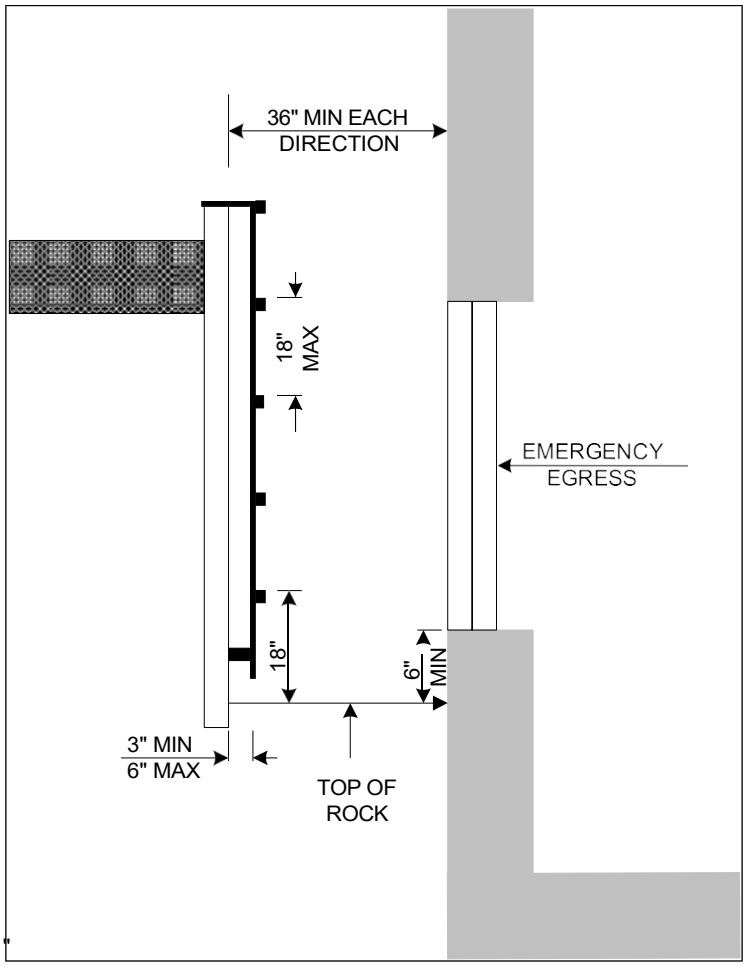


FIGURE 2: Typical Window Well Requirements

Ladder Requirements

When a window well is greater than 44” deep, a permanently attached ladder or steps shall be provided. Ladders shall be a minimum of 12” wide and rungs shall be spaced a maximum of 18” on center. The bottom rung of the ladder shall not be more than 18” above finish grade of the well. The ladder shall be a minimum of 3” away from the wall or well and shall not project into the required window well more than 6”. If the ladder projects more than 6” into the required area, the size of the window well shall be increased to maintain the required area. See FIGURE 2.

REQUIREMENTS FOR WALL CONSTRUCTION

Fire Blocking/Draft Stopping

Fire blocking shall be provided to cut off all concealed draft openings and to form an effective fire barrier between stories. See FIGURE 3 – FIGURE 7. Fire blocking shall be provided in the following locations:

- In concealed spaces of stud walls and partitions, including furred spaces, at the ceiling and floor level and at 10’ intervals, both horizontal and vertical.
- At all interconnections between concealed vertical and horizontal spaces such as occur at soffits, drop ceilings, cove ceilings, etc.
- In concealed spaces between studs adjacent to stair stringers.
- At openings around vents, pipes, and ducts at the ceiling and floor level; batts or blankets of mineral wool, un-faced fiberglass, or spray foam may be used.

Fire Blocking/Draft Stopping Material

Fire blocking shall consist of one of the materials listed below. The integrity of all fire blocking shall be maintained.

- 2x lumber (2x4, 2x6, etc.).
- Two thicknesses of 1x lumber (1x4, 1x6, etc.) with staggered joints.
- One thickness of 23/32” plywood or OSB with joints backed with the same material.
- One thickness of 3/4” particleboard with joints backed with the same material.
- 1/2” gypsum board.
- 1/4” cement-based millboard.
- Batts or blankets of mineral wool or glass fiber or other approved materials installed in such a manner as to be securely retained in place.
- Cellulose insulation installed as tested in accordance with ASTM E119 or UL263, for the specific application.

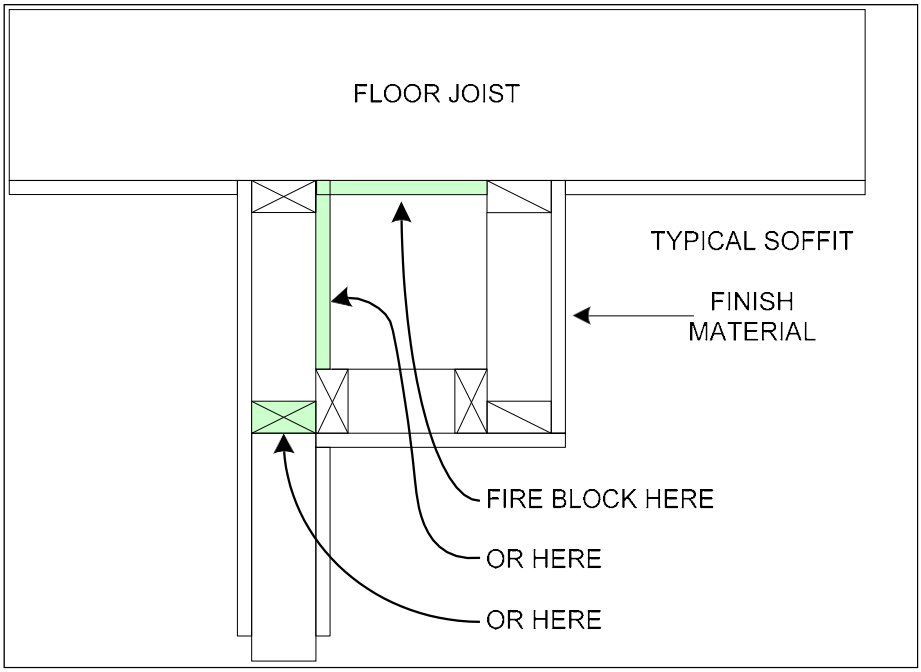


FIGURE 3: Fire Blocking Detail at Soffit

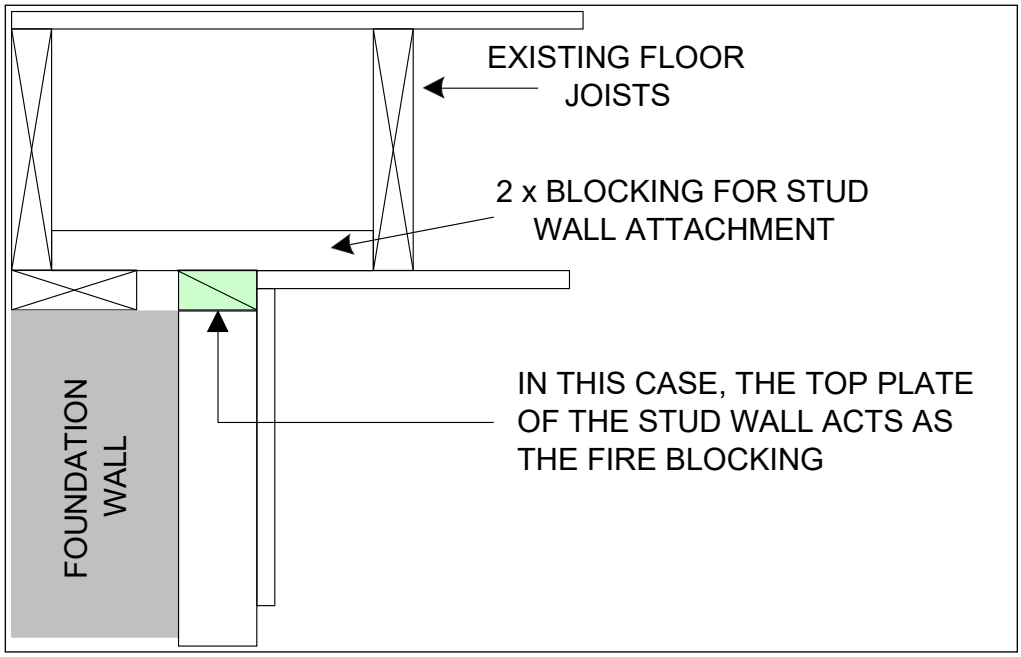


FIGURE 4: Typical Fire Blocking Detail

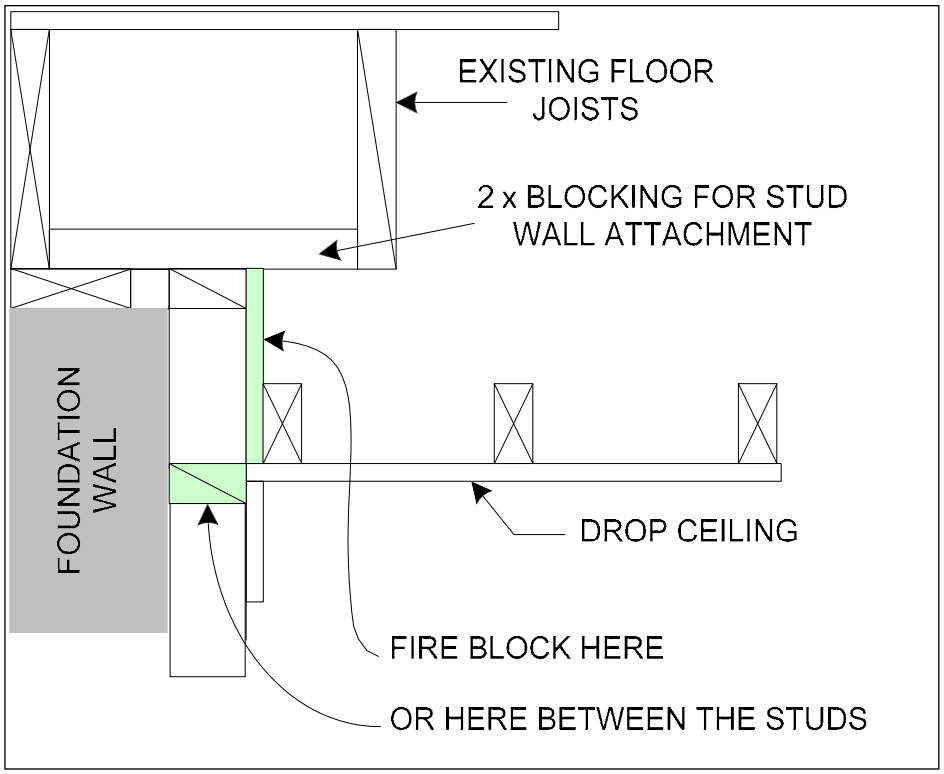


FIGURE 5: Fire Blocking at Drop Ceiling

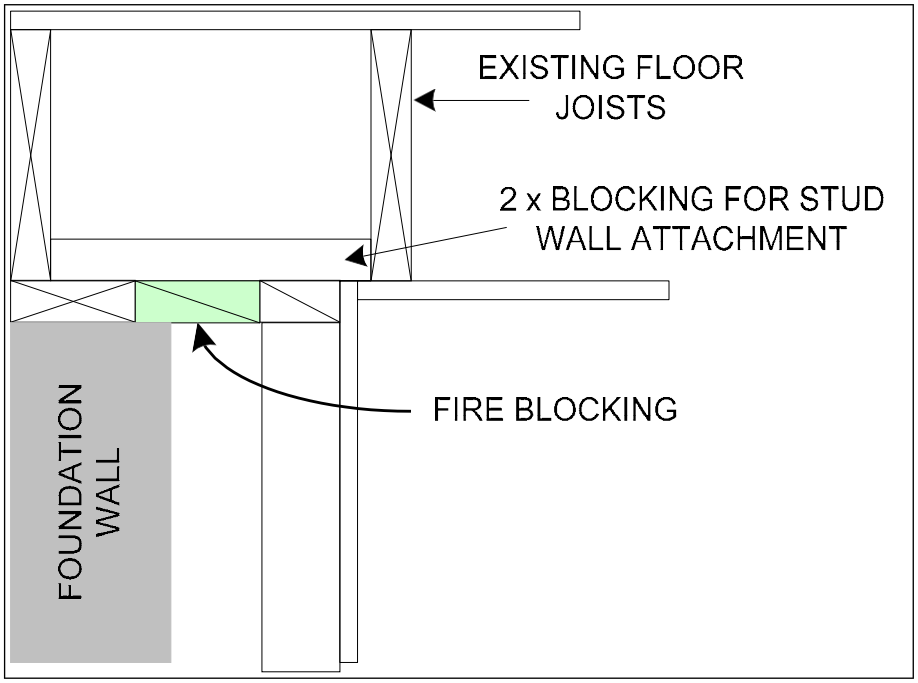


FIGURE 6: Fire Blocking at Offset Stud Wall

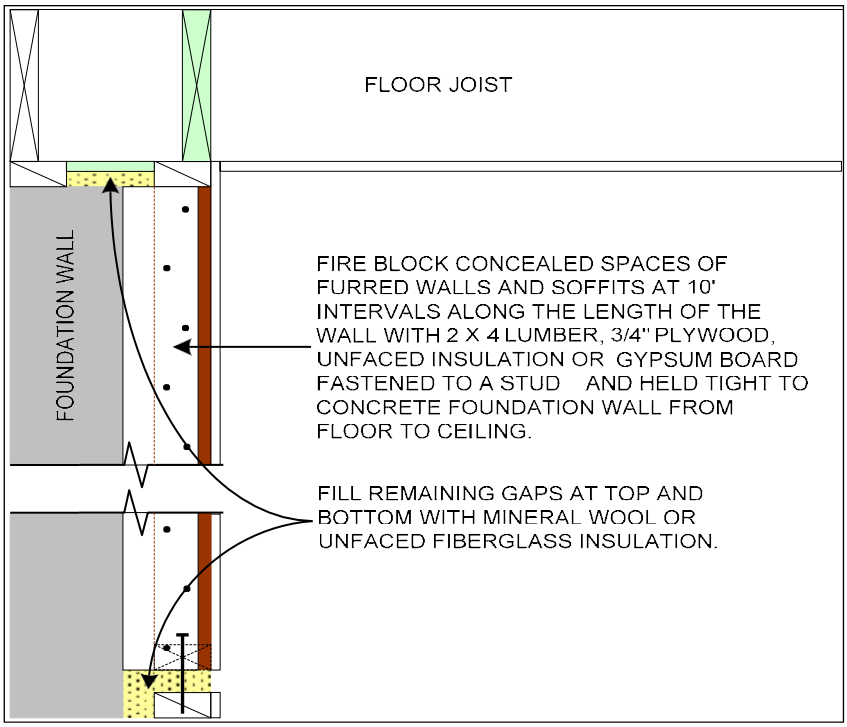


FIGURE 7: Vertical Fire Blocking at Walls

Non-bearing Slab on Grade Wall Framing

Due to the expansive nature of soils in Douglas County all non-bearing slab on grade wall framing shall be constructed to allow for 3” of expansion either at the top or bottom of the wall. Exception will only be considered when a “site-specific” soils report from a Professional Engineer is provided recommending a lesser expansion void.

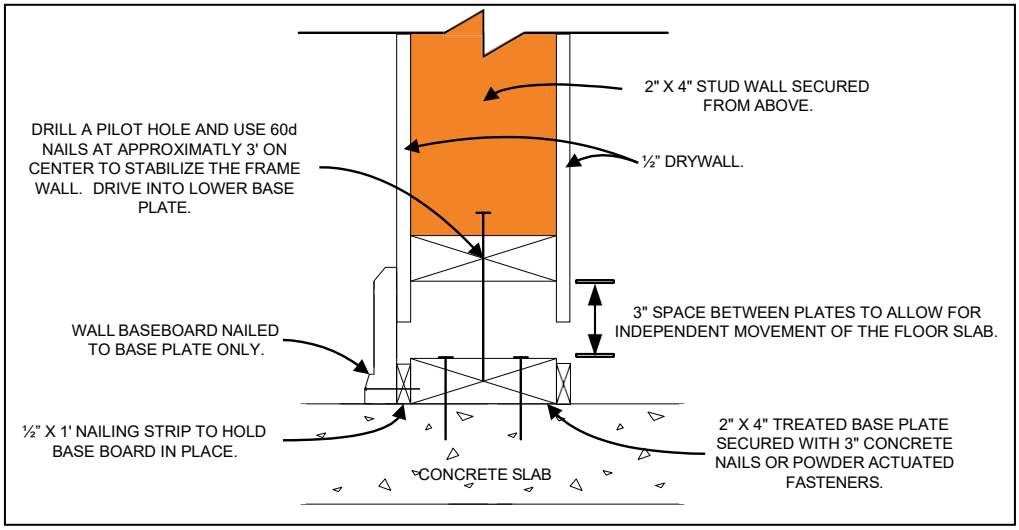


FIGURE 8: Non-bearing Slab on Grade Wall Framing

Drywall

- Glass mat gypsum backing panel, fiber-reinforced gypsum panels, non-asbestos fiber-cement backer board, non-asbestos fiber mat-reinforced cementitious backer units or other approved material, shall be installed on walls in bathtub and shower spaces that will be finished with a non-absorbent surface.
- Water resistant drywall shall not be installed over a vapor retarder in a shower or tub compartment.
- Screws shall be placed 12” on center (Nails 7” on center)
- Screws shall penetrate wood members a minimum of 5/8” (Nails 7/8”).
- Screws shall penetrate steel members a minimum 3/8”.
- Check manufacturer’s recommendations for cementitious or tile backer materials. Most require corrosion resistant fasteners to be used.

REQUIREMENTS FOR FLOOR / CEILING CONSTRUCTION

Draftstopping

When the ceiling of the finished basement is not attached directly to the underside of the floor joists above or when the floor joists are comprised of open web trusses, draftstopping shall be provided. Sufficient draftstopping shall be installed such that the area of the concealed space does not exceed 1,000 sq. ft. and is divided into approximately equal areas. Draftstopping shall be installed parallel to the floor framing members. See FIGURE 9 and FIGURE 10.

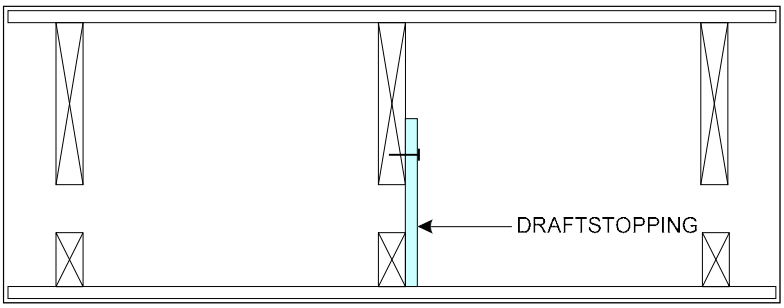


FIGURE 9: Draftstopping at Drop Ceiling

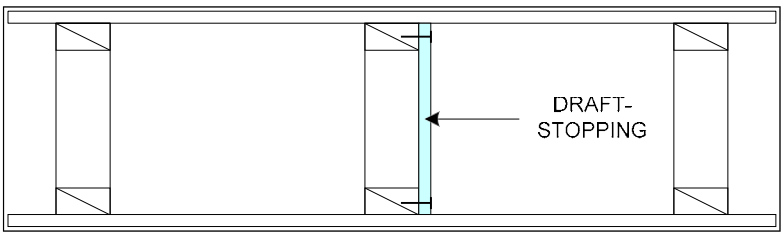


FIGURE 10: Draftstopping at Open Web Trusses

Draftstopping Material

Draftstopping shall consist of one of the materials listed below. The integrity of all draftstopping shall be maintained.

- 1/2" gypsum board.
- 3/8” wood plywood or OSB.
- 3/8” particleboard, type 2-M-W.
- Unfaced insulation.

Drilling and Notching Joists

Notches in the top or bottom of joists shall not exceed one-sixth of the joists' depth and cannot be located in the middle third of the span. **Cantilevered (overhanging) joists cannot be notched.** Holes drilled in joists shall not be within 2" of the top or bottom of joists, and their diameter shall not exceed one-third the depth of the joist. See FIGURE 11. **Drilling and notching of engineered wood products (TJI, BCI, LVL) shall be in accordance with manufacturer's instructions.**

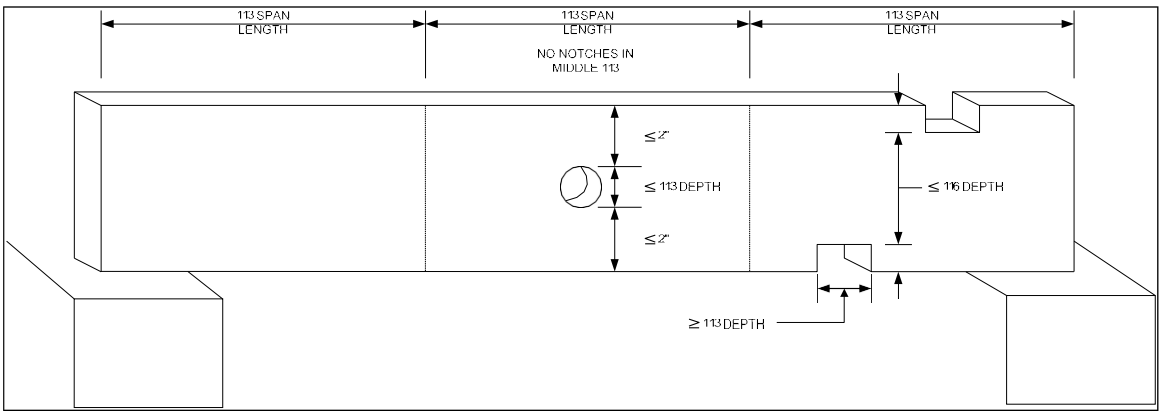


FIGURE 11: Drilling and Notching of Joists

MECHANICAL REQUIREMENTS

Appliance Access

Furnaces, water heaters, and other appliances shall be accessible without removing permanent construction and shall meet the following minimum criteria:

- 30” x 30” clear floor space at front/control side.
- Clearances may be achieved by opening a door(s) in front of the appliance; door shall be min. 6” from appliance when closed.
- Doors to furnace rooms shall be a minimum of 24” wide and be of sufficient size to remove the largest appliance.
- Additional return air is required when finishing the basement level. The minimum size is 100 sq. in.
- Unfinished mechanical rooms shall have a light and a GFCI outlet.
- Access to a mechanical room shall not be located in or get combustion air from a sleeping room, bathroom, storage closet or toilet room.

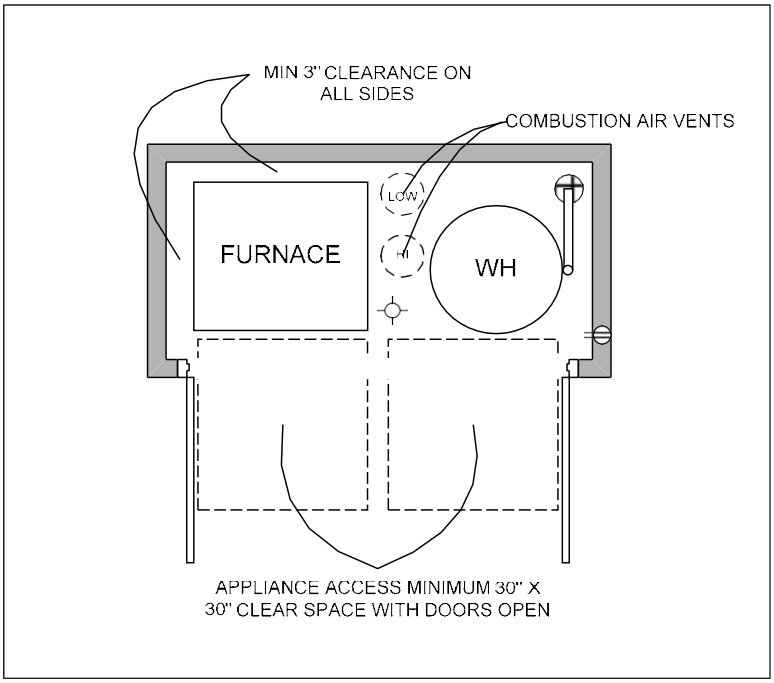


FIGURE 12: Mechanical Room

Combustion Air

Mechanical rooms with fuel-burning appliances other than direct vent, shall be provided with two permanent openings to the outside: one within 12" of the top and one within 12" from the bottom of the adjoining wall. Each opening shall have a minimum free area equal to 1 sq. in. per 2,000 btu/h* for horizontal ducts, and 1 sq. in. per 4,000btu/h* for vertical ducts. *Input rating of all appliances in the furnace room.

Insulation requirements for mechanical room containing outside combustion air:

- Walls and ceiling not less than the basement wall requirement R-15/19.
- Gasketed door(s) providing access to the mechanical room.
- Supply and return ducts shall be insulated with a minimum R-8 insulation.
- Water pipes shall be insulated with a minimum R-3 pipe insulation.
- Combustion air ducts shall be insulated where they pass through conditioned space to an R-value of not less than R-8.

Clothes Dryer

- Exhaust for the dryer shall not exceed 35' in length. Reduce the total length 2'-6" for every 45-degree bend and 5' for each 90-degree bend.
- Dryers located in a closet shall be provided with makeup air having an opening not less than 100 sq. in.
- Clothes dryer exhaust ducts shall terminate on the outside of the building. Termination shall be in accordance with the manufacture's installation instructions. If the instructions do not specify a location, the exhaust duct shall terminate not less than 3' in any direction from openings into buildings.
- Exhaust duct terminations shall be equipped with a backdraft damper. Screens shall not be installed at the termination.

Exhaust Ducts and Exhaust Openings

- Air exhaust openings shall terminate not less than 3’ from property lines; 3’from operable and non-operable openings into the building and 10’ from mechanical air intakes except where the opening is located 3’ above the air intake.

PLUMBING REQUIREMENTS

Showers

Showers and shower compartments shall meet the following requirements:

- Shower compartments shall have a minimum dimension of 30”x30” and a minimum ceiling height of 70” measured from the drain inlet.
- Hinged shower doors shall open outward.
- All glass which encloses a shower or tub shall be safety glazed.
- Shower control valves shall be scald resistant (in accordance with ASSE 1016 or CSA B125) with a hot water limit of 120º F.
- Poured or built-in-place shower pans are required to have a liner inspection. The liner shall turn up on all sides and extend at least 2” above the finished threshold level and pitch a minimum of 2% slope towards the drain.

Fixture Clearances

Toilets, sinks, and showers shall have the minimum clearances listed below. See FIGURE 13.

- 21” in front of sinks and toilets.
- 24” in front of shower stall opening.
- 15” clearance from a toilet’s center to an adjacent fixture or wall on each side.

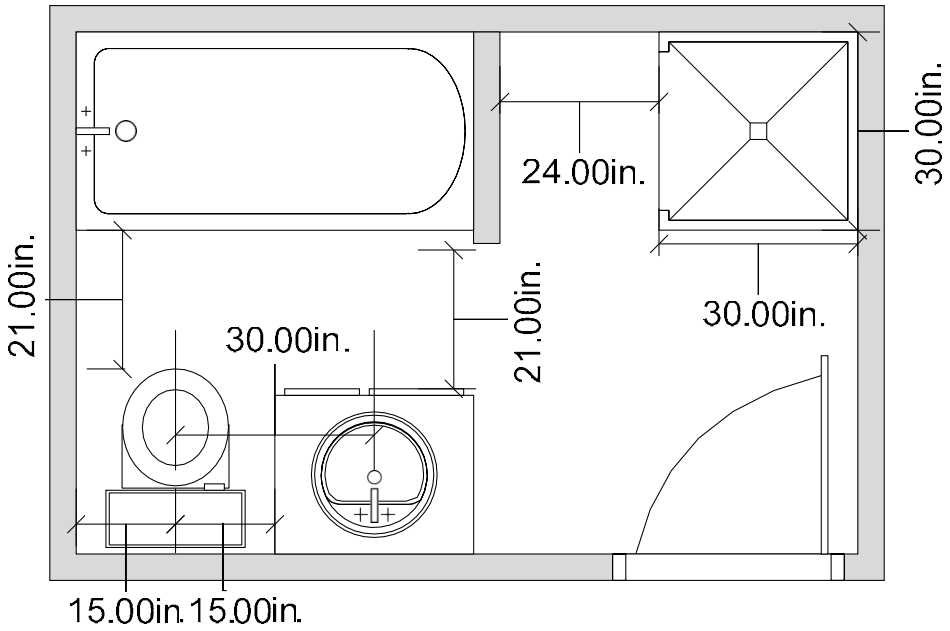


FIGURE 13: Bath Group Fixture Clearances

Drain Size

Fixture drain size shall meet the dimensions noted below.

Size of traps and trap arms for plumbing fixtures

Plumbing Fixtures	Trap Size Minimum (inches)
Bathtub (with or without shower head and/or whirlpool attachments)	1 ½
Bidet	1 ¼
Clothes washer standpipe	2
Dishwasher (on separate trap)	1 ½
Floor Drain	2
Kitchen sink (one or two traps, with or without dishwasher and garbage grinder)	1 ½
Laundry tub (one or more compartments)	1 ½
Lavatory (bath sink)	1 ¼
Shower	2
Water closet (toilet)	* Note a

a. Consult fixture standards for trap dimensions of specific bowls. Trap size shall be consistent with the fixture outlet size.

ELECTRICAL REQUIREMENTS

Panelboard (circuit breaker box)

Panelboards shall meet the requirements listed below.

- A workspace 30” wide or the width of the equipment, whichever is greater and 36” deep from the face of the cover from floor to the ceiling with a minimum height of 6’-6” shall be provided in front of the panelboards, measured from either edge of the panelboard.
- Panelboard workspace shall not be used for storage at any time.
- Panelboards shall not be located in clothes closets, bathrooms, toilet rooms, or located over the steps of a stairway.
- Provide a light for the panelboard workspace.
- Panel door shall open to greater than or equal to 90 degrees.
- All grounding electrode terminations (UFER) shall remain accessible.

SEE FIGURE 14

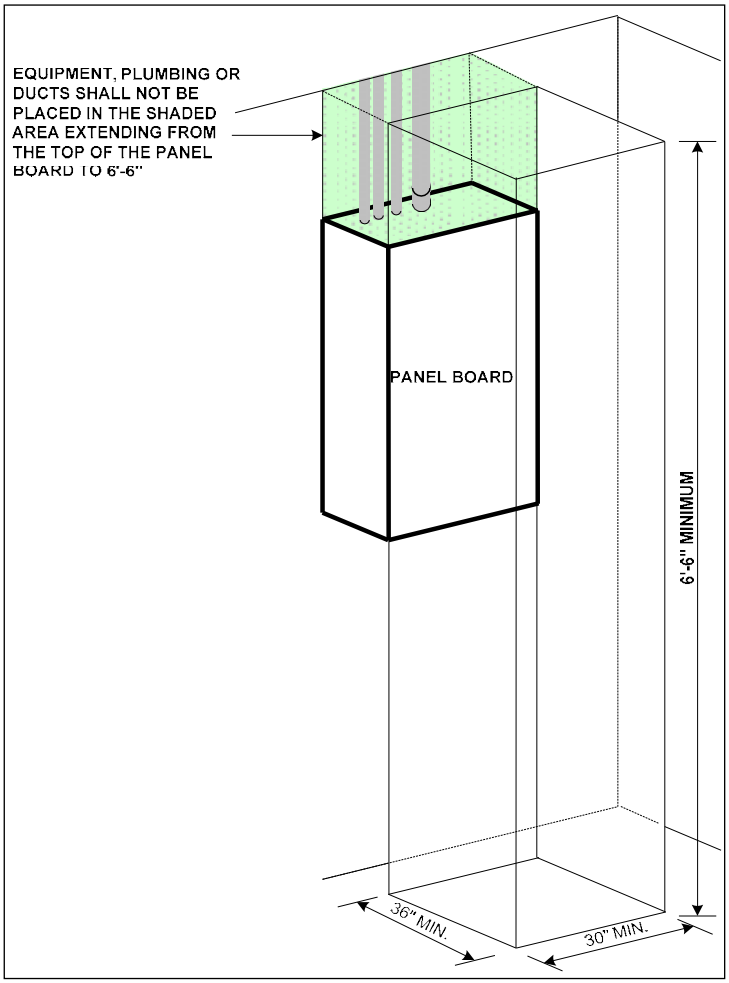


FIGURE 14: Panel Board

Smoke Alarms – See Page 6 for detailed requirements

Carbon Monoxide Alarms – See Page 6 for detailed requirements

Branch Circuits

Branch circuits shall meet the requirements listed below.

- Use a 15 or 20 ampere rated branch circuit for general use purposes such as lighting and receptacles.
- A 20-ampere branch circuit shall be provided to serve laundry room outlets only.
- A 20-ampere branch circuit shall be provided to serve bathroom receptacle(s), lighting and exhaust fan. This circuit shall have no other outlets.
- Circuits serving habitable rooms, lighting, receptacles, and smoke detector outlets shall have arc-fault circuit breakers.

	Circuit Rating		
	15 amp	20 amp	30 amp
Min. conductor size	14	12	10
Outlets rating, amperes	15 Max.	15 or 20	30
Max. number of outlets and lights	10	12	1 (240v)

(Lighting only circuits using LED fixtures may be calculated separately not to exceed 80% of the branch circuit overcurrent protection.)

Receptacles (outlets)

Outlets shall meet the requirements listed below:

- All 125 volt 15- & 20-amp receptacles shall be tamper-resistant.
- Receptacles shall be placed so that no location along the floor/wall line is more than 6’ from a receptacle. FIGURE 15
- The minimum wall length which requires a receptacle is 2’.

- Knee walls, built-in bars, and other fixed room dividers shall be included in wall length for outlet spacing.
- Hallways more than 10’ long shall have a minimum of one receptacle.
- Receptacles installed for specific appliances shall be within 6’ of the appliance location.
- Bathrooms shall have at least one receptacle located on a wall adjacent to, and within 36” of each bathroom sink, and within 12” of basin top. All bathroom receptacles shall have ground fault circuit interrupter (GFCI) protection. Arc-fault circuit protection is not required in the bathrooms.
- At least one receptacle shall be provided to serve laundry appliances. This branch circuit requires 20amp 12 wire AFCI and GFCI protection.
- Each unfinished portion of the basement is required to have at least one receptacle with GFCI protection.
- A receptacle shall be provided within 25’ of heating and air-conditioning appliances and equipment at the same level with GFCI protection.
- Receptacles shall not be installed inside tub or shower space within a zone of 3' horizontally from outside edge bathtub or shower stall. The zone also includes space vertically from the floor to 8' above the top of bathtub rim or shower stall threshold (NEC 406.9C).

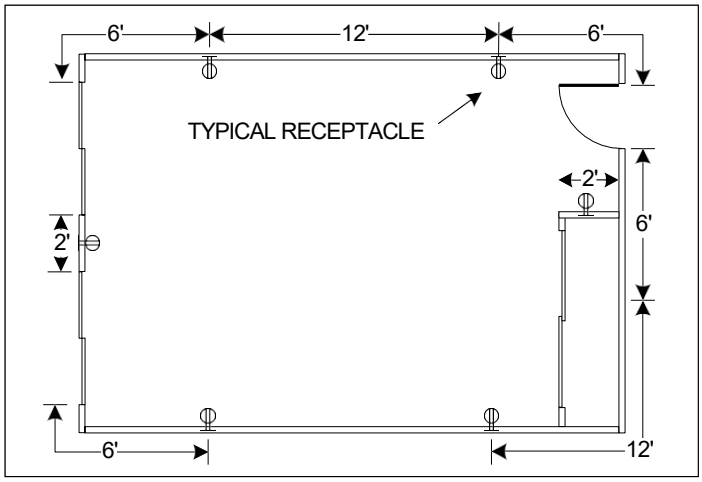


FIGURE 15: Typical Outlet Distribution

Lighting Requirements

Lights shall meet the requirements listed below:

- At least one switch-controlled light shall be provided in each room, hallway, and stairway. A switch-controlled receptacle may be substituted in all rooms except bathrooms, kitchens, and hallways.
- At least one switch controlled or pull chain light shall be provided in each storage area and at or near heating and air-conditioning appliances and equipment.
- Lighting fixtures shall not be installed within 3' horizontally and 8' vertically of a bathtub rim or shower stall threshold. A light fixture may be installed above a shower if it is constructed so that water cannot enter or accumulate in wiring areas and the lighting fixture is marked "suitable for wet locations".
- Light fixtures shall be installed so that combustible materials are not subject to temperatures greater than 90º F.

Light Fixtures in Closets

The types of fixtures permitted to be installed in clothes closets shall be limited to surface mounted or recessed incandescent fixtures, or LED luminaries with completely enclosed lamps, and surface mounted or recessed fluorescent fixtures. Incandescent or LED fixtures with open or partially enclosed lamps and pendant fixtures or lamp holders are prohibited. See table below.

Fixture Type	Bulb Type		
	Fluorescent	Incandescent*	LED*
Surface Mounted	6"	12"	12"
Recessed	6"	6"	6"

*Bulb shall be in a completely enclosed lamp.

Heating cables (floor heat) prohibited in closets.
See Part V Electric Heating Cables NEC 424.34 to 424.48.