

FINISHED BASEMENT REQUIREMENT GUIDE

Current Codes:

International Residential Code (ICC); 2012 Edition with 2014, 2015 & 2018 Amendments and IRC Appendix F
International Energy Conservation Code (ICC); 2009 Edition with 2011 & 2012 Amendments
International Plumbing Code (ICC); 2012 Edition with 2014 & 2015 Amendments, and IPC Appendix F
National Electrical Code (NFPA); 2017 Edition

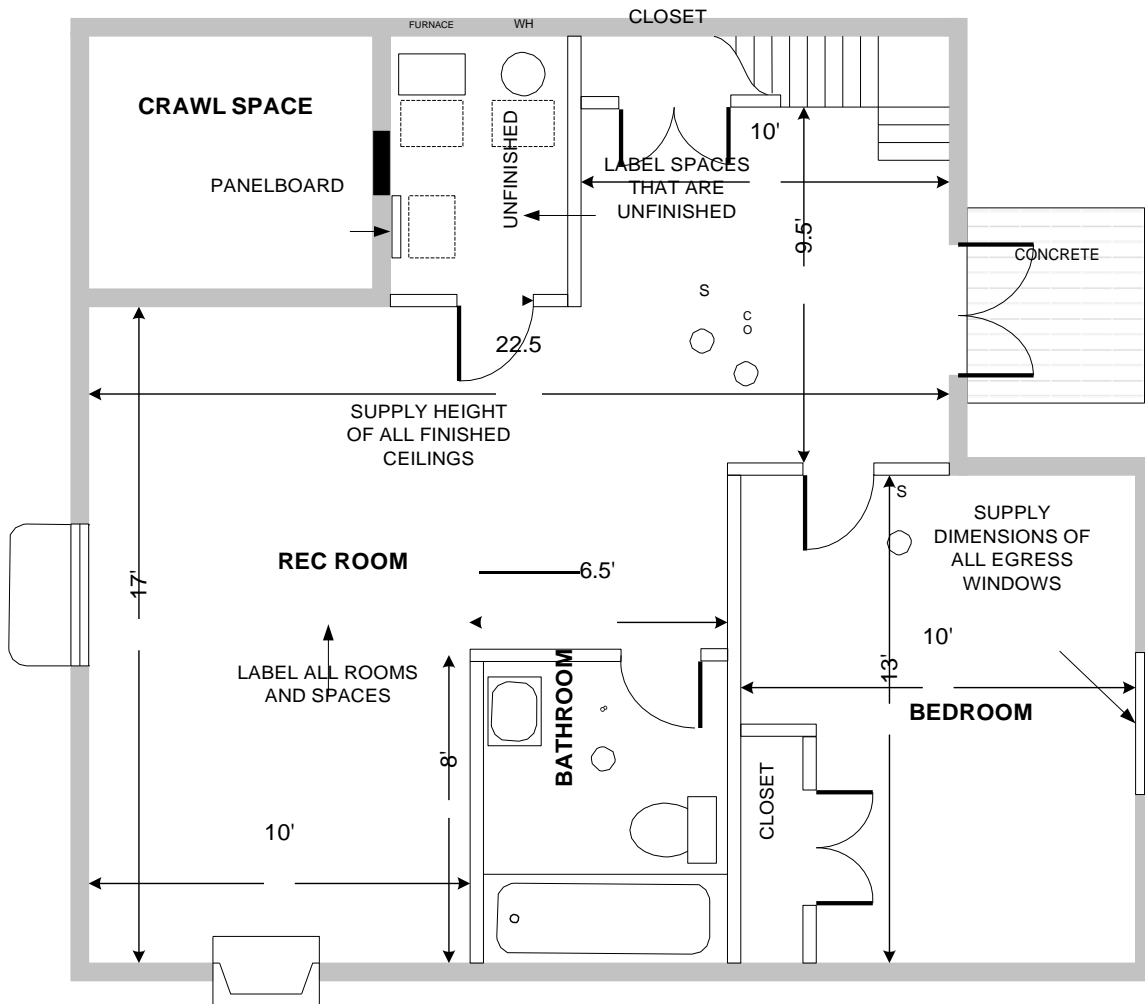
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SAMPLE OF DRAWING REQUIREMENTS

- It is preferable that the floor plan be drawn to a scale of $\frac{1}{4}"$ ($\frac{1}{4}" = 1'$)
- The floor plan shall show the location of the furnace, water heater, stairs and all windows (including sizes).
- Label the intended use of all rooms, unfinished areas and indicate the total finished and unfinished square footage.
- Indicate on the floor plan if the residence is served by public sewer or septic system. Environmental Health approval is required for residences with septic systems.



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

This inspection is performed when the plumbing drainage system is in place. The inspection shall be approved prior to placement of concrete or floor sheathing.

Electrical Slab Inspection

This inspection is required when electrical conduits are installed under any concrete slab prior to placement of concrete.

Rough Electric

This inspection is to be performed when all of 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 Mechanical & Gas Line

This inspection is typically performed when all ducts and exhaust pipes have been installed. The gas system piping shall be completed and tested with a 10 pound air test on a maximum 30 pound gauge.

Rough Frame

This inspection is performed once all of the plumbing, electrical, gas and mechanical rough-in inspections have passed.

Insulation

This inspection is performed after the basement is insulated. The insulation shall be a minimum R values per current Georgia Energy Code.

Final Building

This inspection is performed when all life safety items are in place and the basement finish is completed. Electrical, Plumbing, Mechanical and Final Inspections will be done during the Building Final inspection by the Building Inspector.

GENERAL BUILDING REQUIREMENTS

Room Sizes

One habitable room shall have not less than 120 square feet of gross area. All other habitable rooms shall have an area not less than 70 square feet 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, corridors, bathrooms, toilet rooms and laundry rooms shall have a ceiling height of not less than 7'. Beams, girders, ducts and other obstructions shall not project to less than 6'4" from 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. Mechanical ventilation is not required when a window is provided with minimum operable opening of 1.5 square foot.

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 ¾" with a minimum tread depth of 10".
- 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.

Stair Protection

Enclosed accessible space under stairs shall have walls and ceilings protected with ½" drywall on the enclosed side.

Smoke Alarms

- Shall be installed on each floor, in each bedroom, and outside the immediate vicinity of the bedrooms.
- 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).
- Shall follow manufacturer’s specifications for location near ceiling fans.

Carbon Monoxide Alarms

- Carbon monoxide alarms shall be installed within 10 feet of the entrance to all bedrooms.
- 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 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-5 continuous rigid insulation or a minimum of R-13 batt insulation in all the stud cavities for the full height and length of the basement wall. Exposed paperback insulation is not permitted, remove the paper or install in substantial contact with sheetrock.

Air Sealing Key Points

Building envelope air sealing key points are as follows: bottom and top plates, stud corners, electrical and plumbing exterior wall penetrations, window and door rough openings, exterior wall exhaust fan terminations. Caulking or spray foam maybe used for air sealing.

For helpful illustrations please review current Georgia Energy code amendments:

<http://www.dca.state.ga.us/development/constructioncodes/programs/documents/2011effective/IECC%202011%20Amendments-effective.pdf>

EMERGENCY EGRESS REQUIREMENTS

Where Required

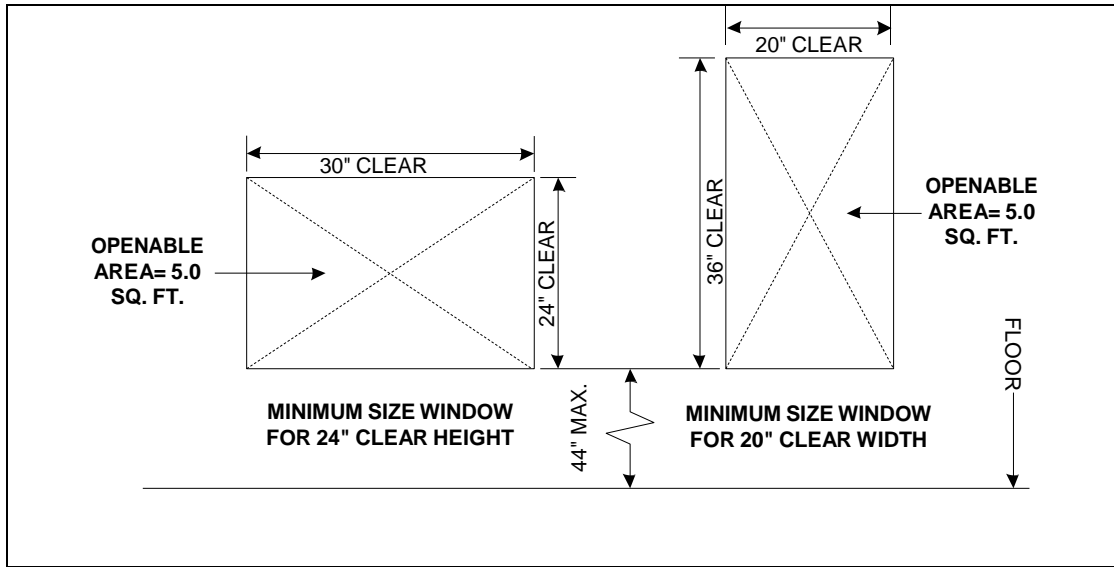
Emergency egress is required for all finished basements regardless of when the house was originally constructed. Emergency egress is also required in all basement bedrooms. However, basements with bedrooms are only required to have emergency egress in the bedrooms.

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 grade level emergency egress windows shall provide a minimum clear opening of 5.0 square feet.
- Minimum clear openable window height of not less than 24”.
- Minimum clear openable window width of not less than 20”
- Windows shall have a sill 44” or less above the finished floor.
- See FIGURE 1 for more opening requirements.



Minimum width and height requirements for an egress window opening to meet 5.0 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	36	35.7	34.5	33.5	32.7	32	31.5	30.7	30	29.5	29	28.2	27.7	27.2	26.7	26.2	25.7	25.5	25	24.5	24	23.7	23.2	22.9	22.5	22.2	21.9	22.5	21.2

FIGURE 1: Opening Requirements

Window Well Requirements

When grade conditions require the sill 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 square feet with a minimum horizontal projection and width of 36 inches. 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.

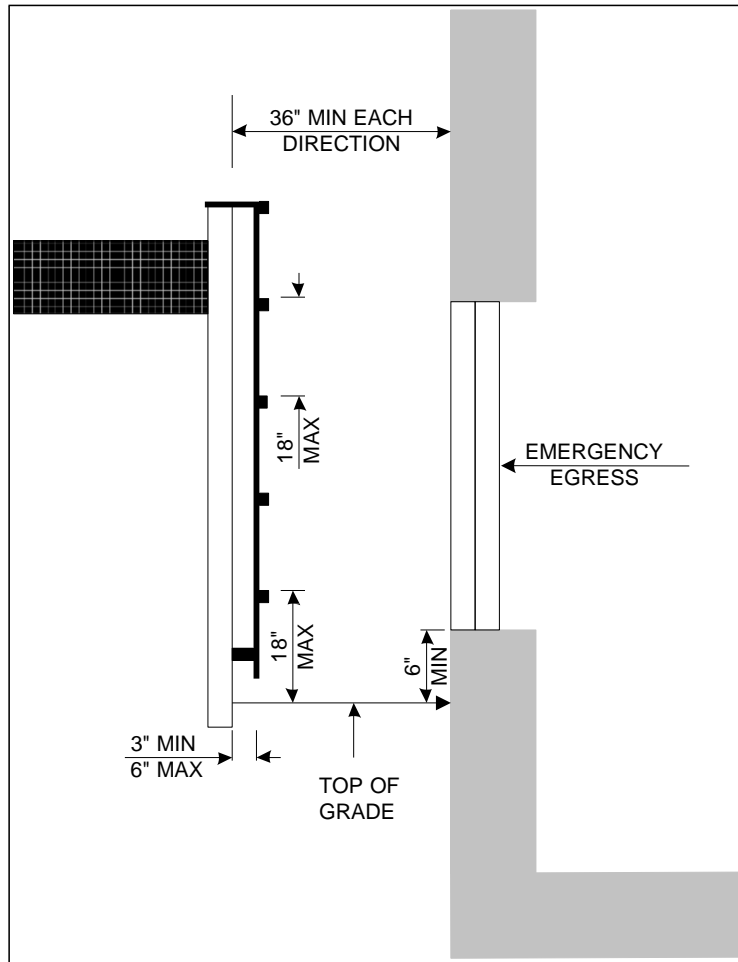


FIGURE 2: Typical Window Well Requirements

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 form an effective fire barrier between stories. See FIGURE 3 – FIGURE 6. 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'-0" 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" of 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.
- Unfaced Insulation

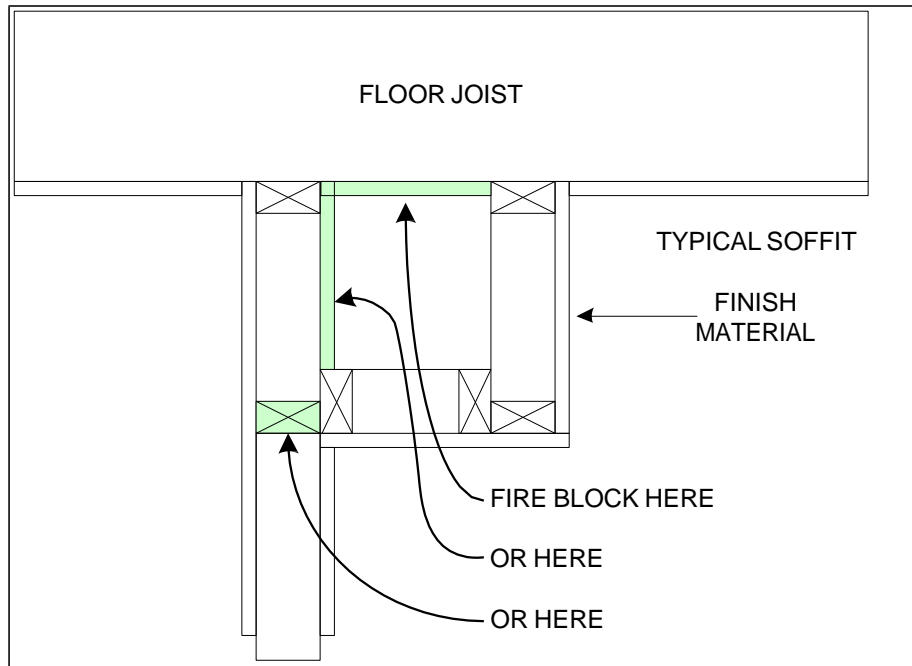


FIGURE 3: Fire Blocking Detail at Soffit

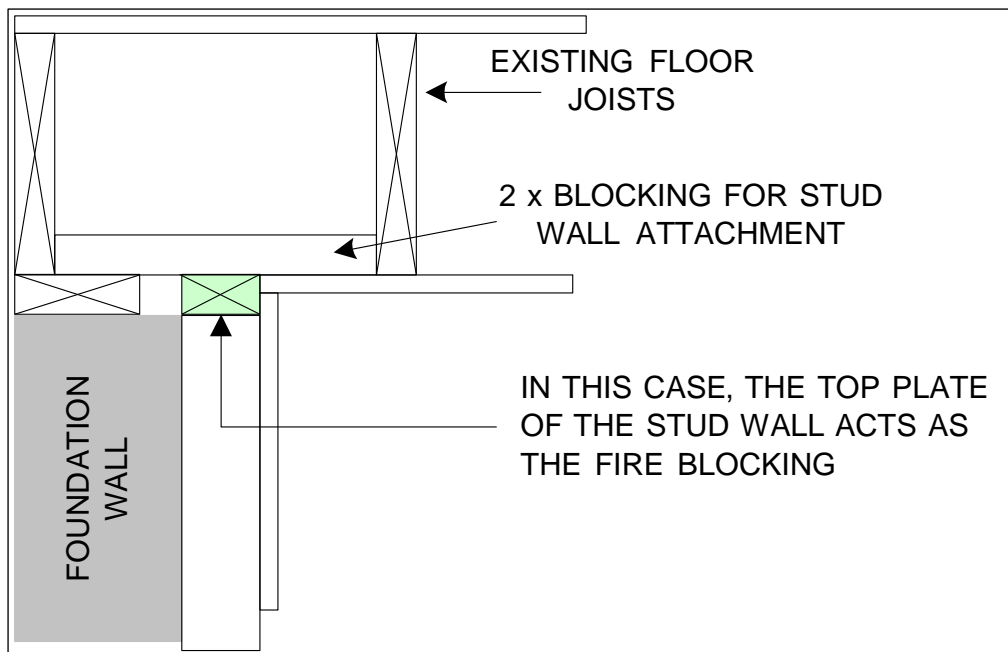


FIGURE 4: Typical Fire Blocking Detail

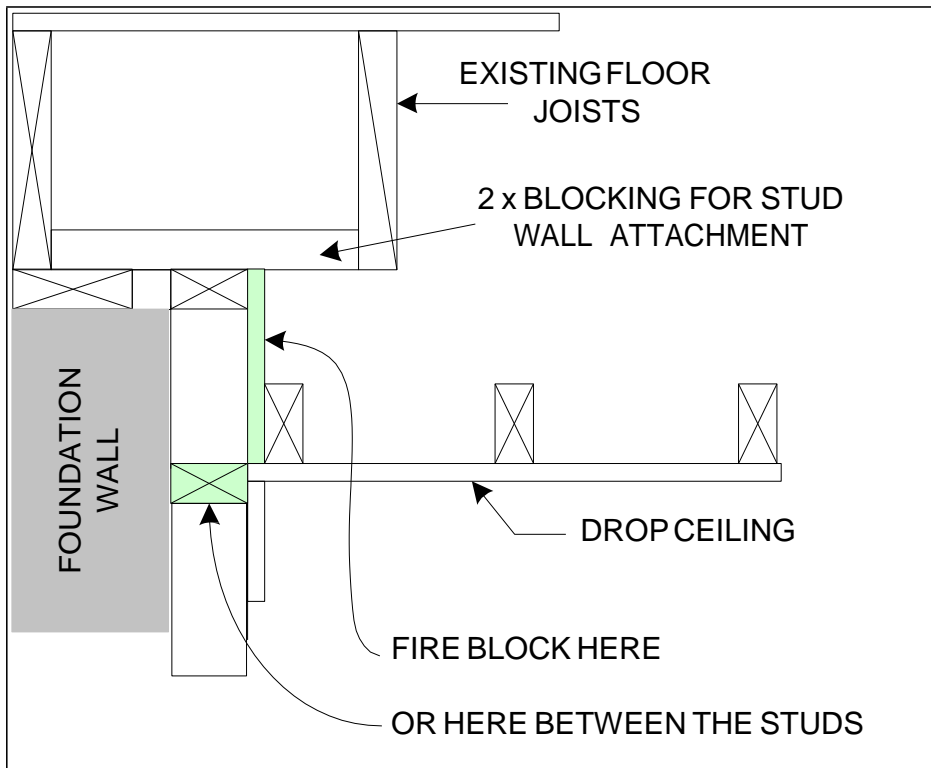


FIGURE 5: Fire Blocking at Drop Ceiling

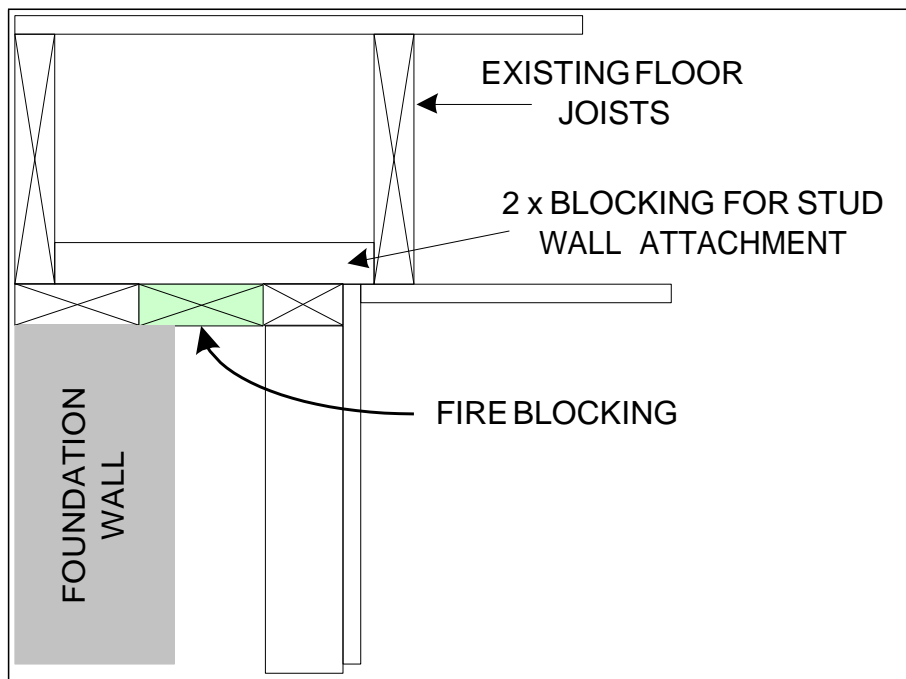


FIGURE 6: Fire Blocking at Offset Stud Wall

Drywall

- Water resistant drywall, or other approved material, shall be installed on walls in bathtub and shower spaces that will be finished with a non-absorbent surface.
- 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. Several 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 sf and is divided into approximately equal areas. Draftstopping shall be installed parallel to the floor framing members. See FIGURE 9 and FIGURE 10.

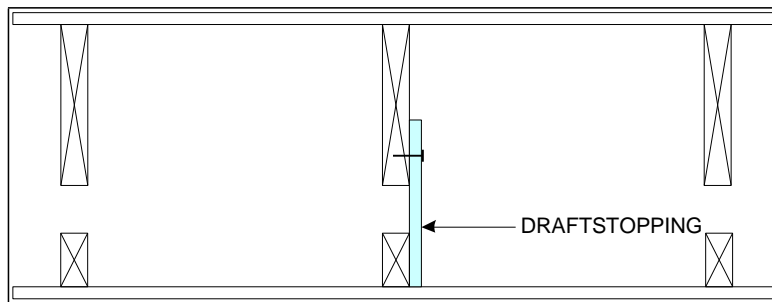


FIGURE 9: Draftstopping at Drop Ceiling

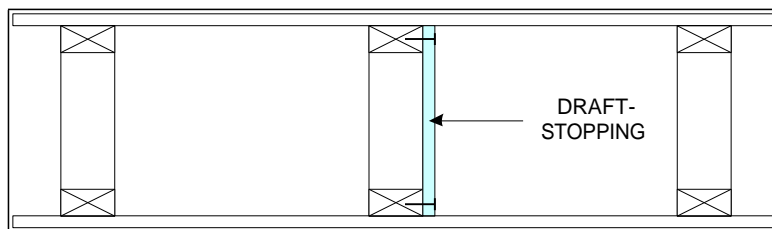


FIGURE 10: Draftstopping at Open Web Trusses

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.**

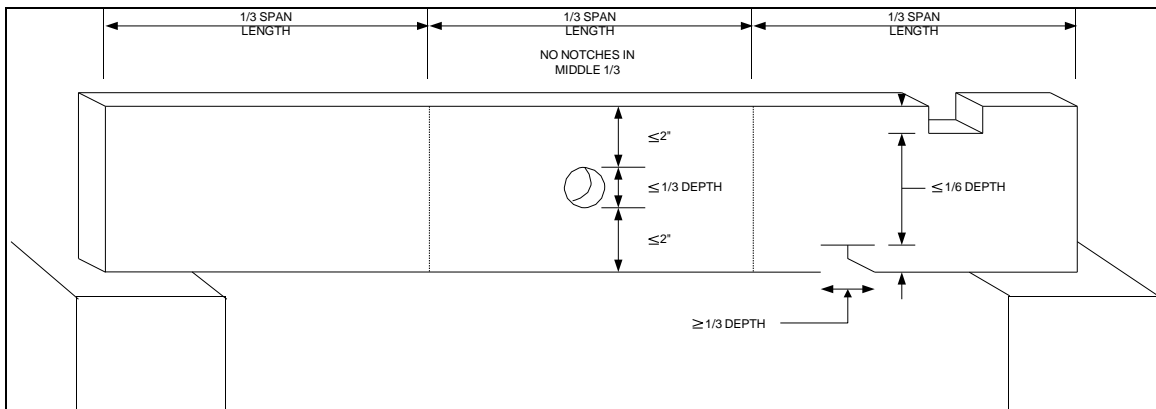


FIGURE 11: Drilling and Notching of Joists

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.
- 3" clearance all other sides and top with a total width of at least 12" wider than the appliance.
- 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 square inches.
- 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.

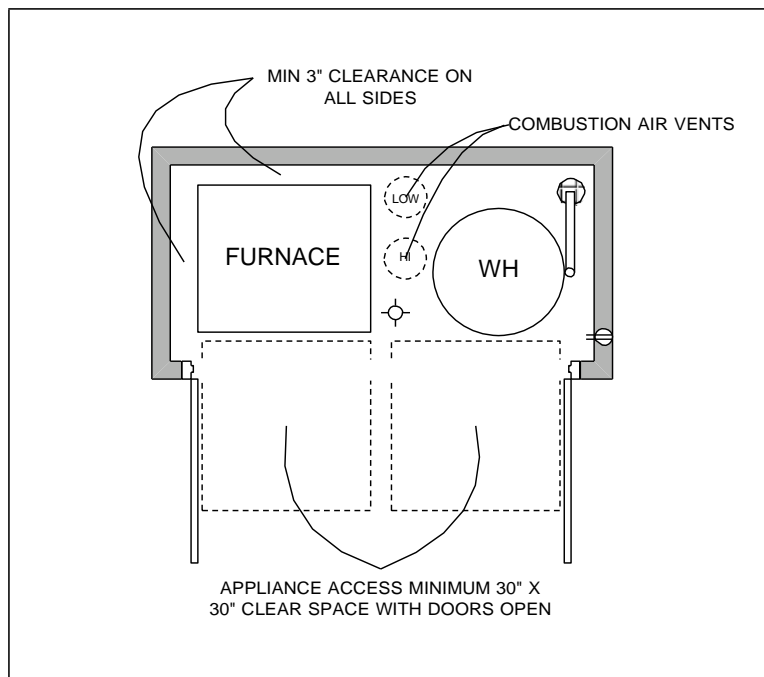


FIGURE 12: Mechanical Room

Combustion Air

Mechanical rooms with fuel-burning appliances 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 square inch per 2,000 Btu/h* for horizontal ducts, and 1 square inch per 4,000btu/h* for vertical ducts. *Input rating of all appliances in the furnace room. Also consult current GA Energy Code requirements at:

<http://www.dca.ga.gov/development/constructioncodes/programs/codeAmendments.asp>

Clothes Dryer

- Exhaust for the dryer shall not exceed 35’ in length. Reduce the total length 2.5’ for every 45-degree bend and 5’ for each 90-degree bend.

PLUMBING REQUIREMENTS

Showers

Showers and shower compartments shall meet the following requirements:

- Shower compartments shall have a minimum dimension of 30" x 30" 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 120° F.
- Poured 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 centering to an adjacent fixture or wall on each side.

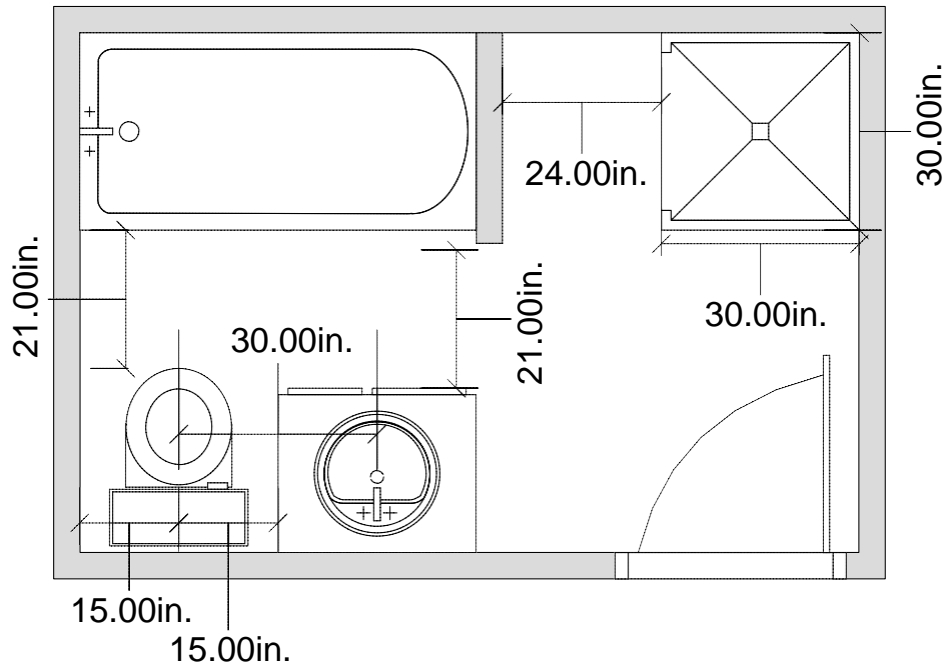


FIGURE 13: Water Closets

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, or toilet rooms.
 - 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

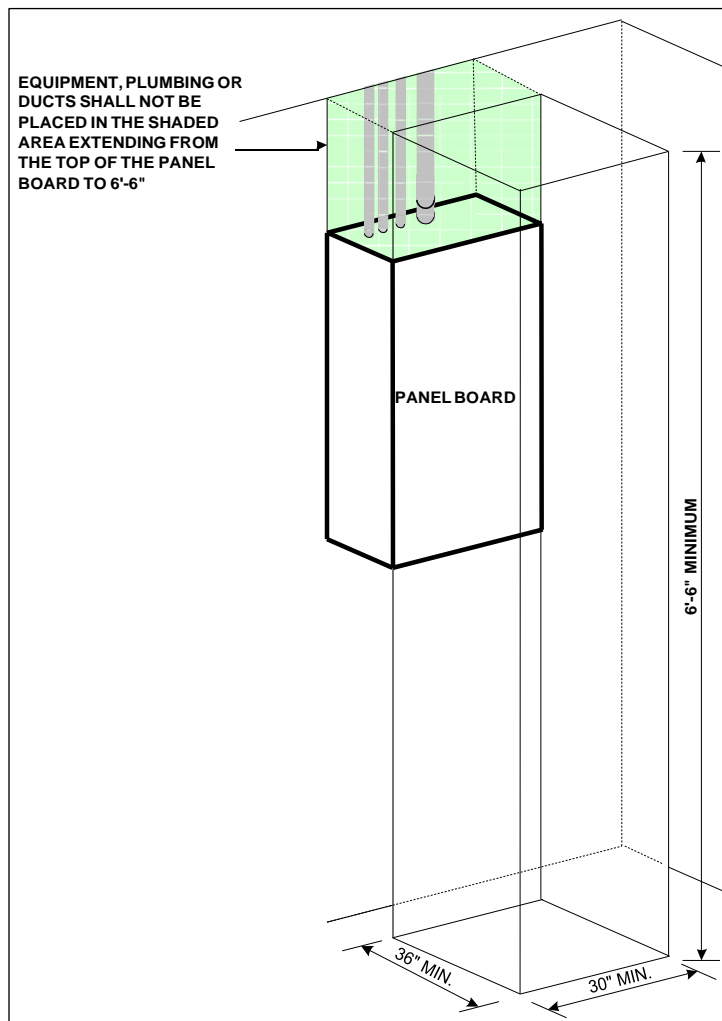


FIGURE 14: Panel Board

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)

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’-0” from a receptacle. FIGURE 15
- The minimum wall length which requires a receptacle is 2’-0”.
- Kneewalls, built-in bars, and other fixed room dividers shall be included in wall length for outlet spacing.

- Hallways more than 10'-0" long shall have a minimum of one receptacle.
- Receptacles installed for specific appliances shall be within 6'-0" 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 protection.
- Each unfinished portion of the basement is required to have at least one receptacle with ground fault circuit interrupter (GFCI) protection.
- A receptacle shall be provided within 25'-0" of heating and air-conditioning appliances and equipment at the same level.

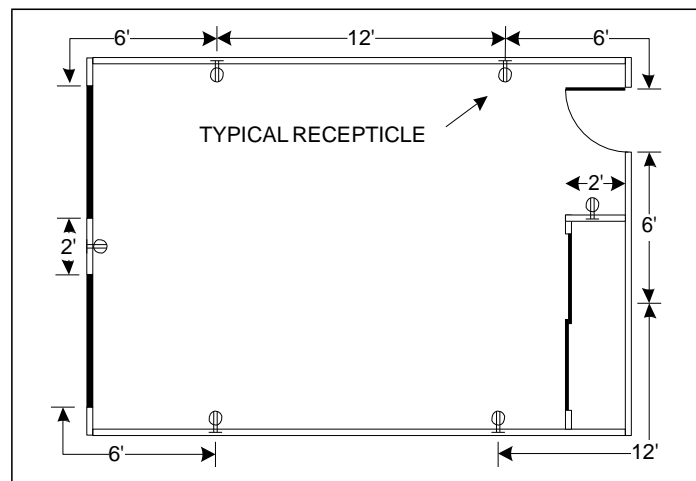


FIGURE 15: Typical Outlet Distribution

Lighting Requirements

Lights shall meet the requirements listed below:

- At least one switch controlled light shall be provided in each room and hallway. 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’-0” horizontally and 8’-0” 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 90° F.

Light Fixtures in Closets

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

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

*Bulb shall be in a completely enclosed lamp.

*Also consult current GA Energy Code requirements at:

<http://www.dca.ga.gov/development/constructioncodes/programs/codeAmendments.asp>