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CITY PLANNING & DEVELOPMENT

One- and Two-Family Basement Finish Products
Information Bulletin No. 132

Purpose

Many City Planning & Development (CPD) customers wish to finish basement spaces within both new and existing one- and two-family dwellings. Although CPD neither requires nor reviews plans for such work, permits are required unless specifically exempted by Article I of the Kansas City Building and Rehabilitation Code. Since these projects may have complications related to code conformance, as an added service to our customers, CPD hereby offers the following list of code requirements for consideration. This list is intended to help our customers avoid common deficiencies, but it should not be considered to be a complete list of code requirements for such work.

Ceiling Height

2018 International Residential Code Section R305.1 states that habitable rooms, hallways, corridors, bathrooms, toilet rooms, laundry rooms and basements shall have a ceiling height of not less than 7ft. Not more than 50% of the required area may have a sloped ceiling less than 7ft in height with no portion of the required areas less than 5ft in height. Portions of a room with a sloping ceiling measuring less than 5ft or a furred ceiling measuring less than 7ft from the finished floor to the finished ceiling shall not be considered as contributing to the minimum required habitable area for that room.

Bathrooms shall have a minimum ceiling height of 6ft 8in over the fixture and at the front clearance area for fixtures as shown in Figure R307.1. A shower or tub equipped with a showerhead shall have a minimum ceiling height of 6ft 8in above a minimum area of 30in by 30in at the showerhead.

Ceilings in basements without habitable spaces may project to within 6ft 8in of the finished floor; and beams, girders, ducts or other obstructions may project to within 6ft 4in of the finished floor.

Stair Headroom and Geometry

2018 International Residential Code (IRC) Sections R311.7.5.1 and R311.7.5.2 state that stairways accessing basements shall have riser heights of not more than 7¾in and a run length of not less than 10in. IRC Section R311.7.2 states that stairs shall have a headroom clearance of not less than 6ft 8in, measured from the nosing of the treads. Stairways shall be a minimum of 36in in finished width per R311.7.1.

Where the nosings of treads at the side of a flight extend under the edge of a floor opening through which the stair passes the floor opening shall be allowed to project horizontally into the required headroom a maximum of 4¾in.

Under Stair Protection

2018 IRC Code Section R-302.7 states that enclosed accessible space under stairs shall have walls and soffits protected on the enclosed side with ½in gypsum board.

Handrails

2018 IRC Section R311.7.8 states that handrails having minimum and maximum heights of 34in and 38in, respectively, measured vertically from the nosing of the treads, shall be provided on at least one side of stairways of

four or more risers. The handgrip portion of the handrails shall not be more than 2in nor less than 1¼in in cross-sectional dimension, or the shape shall provide an equivalent gripping surface. Handrails projecting from a wall shall have a space of not less than 1½in between the wall and the handrail.

Guards

2018 IRC Section R312.1 states that porches, balconies, or raised floor surfaces located more than 30in above the floor or grade below at any point within 36in horizontally to the open side shall have guards not less than 36in in height. Open sides of stairs with a total rise of more than 30in above the floor or grade below shall have guards not less than 34in in height measured vertically from the nosing of the treads. Required guards on open sides of stairways, raised floor areas, balconies and porches shall have intermediate rails or ornamental closures which will not allow passage of a sphere 4in or more in diameter.

Exceptions:

1. The triangular openings formed by the riser, tread and bottom rail of a guard at the open side of a stairway may be of such a size that a sphere 6in in diameter cannot pass through.
2. Openings for required guards on the sides of stair treads shall not allow a sphere 4 3/8in to pass through.

Basement and Sleeping Room Emergency Escape and Rescue Opening

2018 IRC Section R310.1 states that every basement and every sleeping room shall have at least one operable window or exterior door approved for emergency escape or rescue. The units must be operable from the inside to a full clear opening without the use of keys, tools, or special knowledge. Where windows are provided as a means of egress or rescue they shall have a sill height of not more than 44in above the floor. All escape or rescue windows from sleeping rooms must have a minimum net clear opening of 5.7sqft. The minimum net clear opening height dimension shall be 24in. The minimum net clear opening width dimension shall be 20in.

Exception: Grade floor window may have a minimum net clear opening of 5sqft.

Section R310.2.3 states that window wells required for emergency escape or rescue shall have horizontal dimensions that allow the door or window of the emergency escape and rescue opening to be fully opened and shall provide a minimum net clear area of 9sqft, with a minimum horizontal projection and width of 36in.

Exception: The ladder and steps required by Section R310.2.3.1 shall be permitted to encroach a maximum of 6in into the required dimensions of the window well.

Section R310.2.3.1 states that window wells with a vertical depth greater than 44in below the adjacent ground level shall be equipped with a permanently affixed ladder or steps usable with the window in the fully opened position. Ladders or steps required by this section shall not be required to comply with Sections R311.7 and R311.8. Ladders or rungs shall have an inside width of at least 12in, be spaced at least 3in from the wall and shall be spaced not more than 18in on center vertically for the full height of the window well.

Basements constructed prior to the requirement for a basement escape and rescue opening (2006 IRC, effective date 1/3/2008), may be finished without creating a new escape and rescue opening; however, existing basement openings shall be maintained unless a code-compliant escape and rescue opening exists or is provided. All sleeping rooms shall have an escape and rescue opening within the room.

Smoke Alarms

2018 IRC Section R314 states that smoke alarms shall be installed in each sleeping room, outside of each separate sleeping area in the immediate vicinity of the bedrooms and on each additional story of the dwelling, including

basements and cellars, but not including crawl spaces and uninhabitable attics. Smoke alarms shall be interconnected such that the actuation of one alarm will actuate all the alarms in the individual unit. All smoke alarms shall be approved and listed and shall be installed in accordance with the manufacturer's instructions. IRC Section R314.2.2 states that when alterations, repairs or additions requiring a permit occur (permits for exterior work only, or for plumbing or mechanical work, are excluded), the entire dwelling unit shall be provided with smoke alarms located as required for new dwellings.

Carbon Monoxide Alarms

2018 IRC Section 315.3 states that an approved carbon monoxide alarm shall be installed in dwelling units within which fuel-fired appliances are installed and in dwelling units that have attached garages. Alarms shall be located outside of each separate sleeping area in the immediate vicinity of the bedrooms, and within bedrooms where a fuel-burning appliance is located within the bedroom or an attached bathroom. IRC Section R315.2.2 states that when alterations, repairs or additions requiring a permit occur in existing dwellings (permits for exterior work only, or for plumbing or mechanical work, are excluded), the entire dwelling unit shall be provided with carbon monoxide alarms located as required for new dwellings.

Attached Garages

2018 IRC Section R302.5 states that openings from a private garage into a room used for sleeping purposes shall not be permitted. Other openings between the garage and residence shall be equipped with either solid wood doors not less than 1 3/8in in thickness or 20-minute fire rated doors, or equivalent. Section R302.6 and Table R302.6 state that the garage shall be completely separated from the residence and its attic area by means of 1/2in gypsum board or equivalent applied to the garage side and that garages beneath habitable rooms shall be separated from all habitable rooms above by not less than 5/8in Type X gypsum board or equivalent. Where this separation is a floor/ceiling assembly, the structure supporting the separation shall also be protected by not less than 1/2in gypsum board or equivalent.

Protection Against Decay

2018 IRC Section R317.1 states that all sills and sleepers which rest on a concrete or masonry slab which is in direct contact with the ground, wood joists within 18in of the ground, wood girders within 12in of the ground, ends of wood girders entering exterior masonry or concrete walls having clearances of less than 1/2in on tops, sides and ends, wood siding, sheathing and framing on the exterior of a building having a clearance of less than 6in from the ground, wood structural members supporting moisture permeable floors or roofs that are exposed to the weather and wood furring strips or other wood framing members attached directly to the interior of exterior masonry or concrete walls below grade shall be preservative treated in accordance with AWPA U1, or naturally durable wood as defined in IRC Chapter 2.

Fireblocking

2018 IRC Section R-302.11 states that fireblocking shall be provided to cut off all concealed draft openings (both vertical and horizontal) and to form an effective fire barrier between stories, and between a top story and the roof space. Fireblocking shall be provided in wood-frame construction in the following locations.

1. In concealed spaces of stud walls and partitions, including furred spaces, at the ceiling and floor level;
2. At all interconnections between concealed vertical and horizontal spaces such as occur at soffits, drop ceilings, cove ceilings, etc.;
3. In concealed spaces between stair stringers at the top and bottom of the run; and
4. At openings around vents, pipes, ducts, chimneys and fireplaces at the ceiling and floor level, with approved materials to resist the passage of flame and products of combustion.

Except as provided in Item 4 above, fireblocking shall consist of 2in nominal lumber, or two thicknesses of 1in nominal lumber with broken lap joints, or one thickness of 23/32in plywood with joints backed by 23/32in plywood, or one thickness of 3/4in Type 2-M particleboard with joints backed by 3/4in Type 2-M particleboard, or other approved materials. Batts or blankets of mineral or glass fiber or other approved non-rigid materials shall be permitted for compliance with the 10ft horizontal fireblocking in walls constructed using parallel rows of studs or staggered studs. The integrity of all fireblocks shall be maintained.

Light, Ventilation and Heating

2018 IRC Section R303.1 states that all habitable rooms shall be provided with aggregate glazing area of not less than 8% of the floor area of such rooms. The minimum openable area to the outdoors shall be 4% of the floor area being ventilated.

Exceptions:

1. The glazed areas need not be openable where the opening is not required for emergency escape and rescue and a whole-house mechanical ventilation system is installed in accordance with IRC Section M1507.
2. The glazed areas may be omitted in rooms where the above exception is satisfied and artificial light is provided capable of producing an average illumination of 6ft candles over the area of the room at a height of 30in above the floor level.
3. Use of sunroom and patio covers, as defined in IRC Section R202, shall be permitted for natural ventilation if in excess of 40% of the exterior sunroom walls are open, or are enclosed only by insect screening.

Section R303.3 requires that bathrooms, water closet compartments and other similar rooms shall be provided with aggregate glazing area in windows of not less than 3 square feet, one-half of which must be openable.

Exception: The glazed areas shall not be required where artificial light and a local exhaust system with a ventilation rate of 50cfm intermittent or 20cfm continuous is provided. The exhaust shall be vented directly to the outdoors.

Combustion Air

2018 IRC Section G2407.1 states that fuel -burning equipment shall have provision for a sufficient supply of air for fuel combustion, draft hood dilution and ventilation of the space in which the equipment is installed. The methods of providing such combustion air shall be in accordance with 2018 IRC Sections G2407.5 through G2407.9.

Customers who wish to propose alternate construction methods regarding the above-mentioned items or for any other code requirements, should refer to [CPD Information Bulletin Number 101](#) regarding the Code Modification Request process. For any questions on these provisions or any others relating to one- and two-family dwelling construction, please call (816) 513-1511 where helpful CPD associates stand ready to assist.