

New Home Booklet



City of Union

10 E. Locust St. – Union, MO 63084



BUILDING & ENGINEERING DEPARTMENT

City of Union
10 E. Locust Street - Union, MO 63084

(636) 583-1805

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GENERAL INFORMATION & GUIDELINES FOR RESIDENTIAL BUILDINGS CONSTRUCTED IN THE CITY OF UNION

Present Codes Observed

ICC International Building Code – 2021 Edition
 ICC International Residential Code – 2021 Edition
 ICC International Existing Building Code – 2021 Edition
 ICC International Plumbing Code – 2021 Edition
 ICC International Mechanical Code – 2021 Edition
 ICC International Fuel Gas Code – 2021 Edition
 ICC International Property Maintenance Code – 2021 Edition
 ICC International Energy Conservation Code - 2021 Edition
 NEC 2020 Electric (As amended for area of jurisdiction)

NOTE: These codes are used at the minimum standard that must be adhered to. Additional restrictions and additions placed on new or existing buildings by the City of Union supersede and/or override codes as stated within the above referenced guidelines.

GENERAL

1. Any residential, commercial, or industrial project must be reported to the City of Union Building Department.
2. All work affecting the structure or structural supports of an existing building; all work creating a new structure; any commercial or industrial, whether new construction or an alteration of an existing building, which includes a deck, porch, storage shed, garage, carports, swimming pools (above or in-ground) etc. must have a building permit.
3. All commercial, industrial, and multi-family units must also submit plans to the Union Fire Protection District. They are located at 1401 W. Springfield Ave. – Union, MO. The phone number is (636) 583-2515.
4. Building permits and fees are figured separate from water and sewer fees however if a building is new construction and a water and sewer hookup is needed, the price will be added to the building permit. The contractor will be given the water meter when the building, water and sewer permit is paid for. When the contractor is ready for a tap and connection, please call the City of Union Water Department at (636) 583-3522. **We need 24 hours for taps and hookups.**
5. **NO CONSTRUCTION CAN COMMENCE UNTIL A PERMIT HAS BEEN ACQUIRED.**
6. The permit requirements are the responsibility of the property owner and/or builder.
7. Permits will be issued for construction only if all other regulations and zoning restrictions are complied with as required by the City of Union Code of Ordinances.
8. You must get a Flood Plain Permit to build anything in a flood plain.
9. Permit holders are responsible for making sure that all contractors and/or subcontractors have a valid City of Union Business License BEFORE work begins. Permit holders will be responsible for any fines and/or work stoppage due to non-compliance. Business License forms may be picked up at City Hall or you can download the form from our website at www.unionmissouri.gov. For more information on Business Licenses call (636) 583-3600 and speak with Wanda Parsons. Her email is commdev@unionmissouri.gov.
10. Call (636) 583-1805 for inspections. Give your name, address of the property, permit number and type of inspection needed. If there is no answer, we do have voice mail on our phones. Leave a message and we will set up your inspection from the message.

24-HOURS NOTICE IS REQUIRED FOR ALL INSPECTIONS.

WHAT YOU WILL NEED TO OBTAIN A RESIDENTIAL PERMIT

1. A plot plan showing the dimensions of the lot with the proposed development including distance to the property line on all four sides. We will verify that the required setbacks are within City Code per your blueprints.
 - a.) A site plan
2. We will need 2 sets of detailed drawings of the proposed improvements. Data is to include (but not necessarily limited to) the following in plans submitted:
 - a.) Foundation Plan – show footing and foundation walls with dimensions and rebar placement. Show frost walls where applicable.
 - b.) Floor Plan – show dimensions for all rooms, all rooms must be identified, and show window size and name.
 - c.) Wall Section – show typical wall section, footing, foundation with steel and foundation drain system, floor joists, stud walls insulation factor, and roof specifications.
 - d.) Stair Section – show head room, rise and tread on steps, handrail detail, etc.
 - e.) Four Exterior Wall Elevations – show elevation of each side of house.
 - f.) Fireplace Plan and Section (if applicable) – type flue, if prefab, must have specifications.
 - g.) Truss Plan – if trusses are used, submit the truss company's engineered truss plan for your particular building.
 - h.) Miscellaneous Information – show locations of furnace, hot water heater, attic access, smoke detectors, carbon monoxide protector, vent fans, electrical outlets and location of kitchen, bathroom, and laundry fixtures.
 - i.) Electric – Electric/Lighting plan; indicate locations of lights, wiring and service.
3. A permit application needs to be filled out and submitted with the above plans including an estimated construction cost. PLEASE FILL OUT EVERYTHING HIGHLIGHTED IN YELLOW.
4. NO INSPECTIONS will be made until the full permit fee has been paid.

SPECIAL NOTE: ALL DRIVEWAYS AND ENTRYWAYS UPON CITY STREETS REQUIRE THAT ENTRYWAY, DRIVEWAY AND PARKING SPACES HAVE A HARD SURFACE SUCH AS ASPHALT OR CONCRETE.

BUILDING PERMIT INSPECTIONS FOR RESIDENTIAL

PLEASE NOTE: THERE WILL BE A \$25.00 RE-INSPECT FEE FOR ANY FAILED INSPECTIONS.

1. We will verify all setbacks and zoning regulations based upon owner submitted plat and site plan. The owner is responsible for the exact location of his property lines.
2. The property will be checked for flood plain regulations.
3. The address will be verified and an address number will be assigned.
4. New Construction, Additions, Alterations:
 - a.) Footing & Foundation – Wall Inspections – Piers (BEFORE concrete is poured.)
 - b.) Under-floor plumbing
 - c.) Sewer & Water Line by City of Union Water Dept. (636) 583-3522 – Electrical Conduit by Ameren
 - d.) Rough-In Framing, HVAC, Electrical and Plumbing*
 - e.) Fireplace Installation, Flue Inspections (If Applicable)
 - f.) Electric Service – Make sure you fill out an Ameren Form (Required by Ameren)
 - g.) Drywall Inspection – Firewall and screw pattern
 - h.) Final and Occupancy Inspection

*PLUMBING REQUIRES AIR OR WATER PRESSURE TESTING. **(\$25.00 RE-INSPECT FEE IF NO PRESSURE)**

- A.) 5 LBS. Air Pressure for PVC
- B.) 80 LBS. Water Pressure

Other Inspections:

- a.) Mobile Home Inspections – Water/Sewer hookup, electrical hookup, any decks or stairs, tie-downs.
- b.) Accessory Buildings & Structures
- c.) Electrical Upgrade or Panel Change
- d.) Any Plumbing work
- e.) Any Deck
- f.) Any Swimming Pools – electrical bonding, safety barriers, etc.

P2503.9 Test Gauges. Gauges used for testing shall be as follows:

- 1.) Tests requiring a pressure of 10 psi or less shall utilize a testing gauge having increments of 0.10 psi (0.69kPa) or less.
- 2.) Tests requiring a pressure higher than 10 psi but less than or equal to 100 psi shall use a testing gauge having increments of 1 psi (6.9kPa) or less.
- 3.) Tests requiring a pressure higher than 100 psi shall use a testing gauge having increments of 2 psi (14kPa) or less.

PLEASE CALL 24 HOURS IN ADVANCE FOR ANY INSPECTIONS – (636) 583-1805

RESIDENTIAL CONSTRUCTION REQUIREMENTS

Building Planning & Design

Climatic and Geographic Design Criteria

Roof Snow Load	20 psf
Wind Load	90 mph (3 second gusts) – 76 mph
Seismic Design Category	C
Weathering	Severe
Frost Line Depth	30" (Thirty Inches)
Termite	Moderate to Heavy
Decay	Slight to Moderate
Winter Design Temperature	10°

Minimum Uniformly Distributed Live Loads

Attics Without Storage	10 psi
Attics With Limited Storage	20 psi
Habitable Attics/Attics Served with Fixed Stairs	30 psi
Balconies (Exterior) and Decks	40 psi
Fire Escapes	40 psi
Guardrails and Handrails	200 psi
Guardrail In-Fill Components	50 psi
Passenger Vehicle Garages	50 psi
Rooms Other Than Sleeping Rooms	40 psi
Sleeping Rooms	30 psi
Stairs	40 psi

Bathrooms

Bathrooms, water closet compartments and other similar rooms shall be provided with aggregate glazing area in windows of not less than 3 sq. ft., one-half of which must be openable.

Exception: The glazed area shall not be required where artificial light and a mechanical ventilation system is provided.

Ventilation air from this space shall be exhausted and piped to a roof or soffit vent.

Water resistant gypsum board shall be extended at least 24 inches past any tub or shower enclosure or area.

All plumbing fixtures shall be connected to a sanitary sewer. Kitchen sinks, lavatories, bathtubs, showers, bidets, laundry tubs, and washing machine outlets shall be provided with hot and cold water and shall be connected to an approved water supply.

All single-wall ventilation ducts serving toilet rooms and bathrooms shall be constructed of an approved rigid or flexible metal material. **Vinyl duct is not allowed.**

Exits

Exit Door Required

Not less than one exit door conforming to the Residential Code shall be provided from each dwelling unit. The required exit door shall provide for direct access from the habitable portions of the dwelling to the exterior without requiring travel through a garage.

Type of Lock or Latch

All egress doors shall be readily openable from the side from which egress is to be made without the use of key or special knowledge or effort.

The required exit door shall be side-hinged and shall provide a minimum clear width of 32" and 78 inches in height.

Garages and Carports

Opening Protection

Opening from a private garage directly into a room used for sleeping purposes shall not be permitted. Other openings between the garage and residence shall be equipped with a solid wood door not less than 1 3/8" thick, solid or honeycomb core steel doors not less than 1 3/8" thick, or 20-minute fire-rated doors.

Separation Required

The garage shall be separated from the residence and its attic area by not less than 5/8" fire-resistant gypsum board applied to the garage side. Where the separation is a floor-ceiling assembly, the structure supporting the separation shall also be protected by not less than 5/8" fire resistant gypsum board.

Floor Surface

Garage or carport floor surface shall be of approved non-combustible concrete. The area of floor used for parking automobiles or other vehicles shall be sloped to facilitate the movement of liquids to drain toward the main vehicle entry doorway – 1 inch per 10 feet minimum slope.

Garage Branch Circuits. In addition to the number of branch circuits required by other parts of this section, not less than one 120-volt, 20-ampere branch circuit shall be installed to supply receptacle outlets required by Section E3901.9 in attached garages and in detached garages with electric power. This circuit shall not have other outlets.

Emergency Escape and Rescue Openings

R310.1 Emergency Escape & Rescue

Basements, habitable attics and every sleeping room shall have at least one operable emergency escape and rescue opening. Where basements contain one or more sleeping rooms, emergency egress and rescue openings shall be required in each sleeping room. Where emergency escape and rescue openings are provided, they shall have a sill height of not more than 44 inches above the floor. Where a door opening having a threshold below the adjacent ground elevation serves as an emergency escape and rescue opening and is provided with a bulkhead enclosure, the bulkhead enclosure shall comply with Section R310.3. The net clear opening dimensions required by this section shall be obtained by the normal operation of the emergency escape and rescue opening from the inside. Emergency escape and rescue openings with a finished sill height below the adjacent ground elevation shall be provided with a window well in accordance with Section R310.2. Emergency escape and rescue openings shall open directly into a public way, or to a yard or court that opens to a public way.

Minimum Opening Area.

All emergency escape and rescue openings shall have a minimum net clear opening of 5.7 square feet.

Minimum Opening Height

The minimum net clear opening height shall be 24 inches.

Minimum Opening Width

The minimum net clear opening width shall be 20 inches.

Operational Constraints

Emergency escape and rescue openings shall be operational from the inside of the room without the use of keys, tools or special knowledge.

Window Wells

The minimum horizontal area of the 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 the emergency escape and rescue opening to be fully opened.

Termite Protection

In areas favorable to termite damage as established by Table R301.2(1), methods of protections shall be by chemical soil treatment, pressure preservative treated wood in accordance with the AWPA standards listed in Section R323.1, naturally termite-resistant wood or physical barriers (such as metal or plastic termite shields), or any combination of these methods. If chemical soil treatment is used, concentrations, rate of application and treatment method of any termiticide shall be consistent with and never less than the termiticide label. When treating soils with chemicals, a certification will be required from a licensed exterminator.

Landings

Landings for Stairways

There shall be a floor or landing at the top and bottom of each stairway. **EXCEPTION:** At the top of an interior flight of stairs, provided a door does not swing over the stairs.

Landings At Doors

There shall be a landing or floor on each side of each exterior door. The width of each landing shall not be less than the door served. Every landing shall have a minimum dimension of 36 inches measured in the direction of travel. Landings or floors at the required egress door shall not be more than 1 ½" lower than the top of the threshold. When exterior landings or floors at the required egress door are not at grade, they shall be provided with access to grade by means of a ramp in accordance with Section R311.8 or a stairway in accordance with Section R311.7. Doors other than the required egress door shall be provided with landings or floors not more than 7 ¾" below the top of the threshold.

Stairways

Width

Stairways shall not be less than 36 inches in clear width.

Treads and Risers

The maximum riser height shall be 7 ¾" and the minimum tread depth shall be 10 inches.

Profile

The radius of curvature at the leading edge of the tread shall be no greater than 9/16 inch. A nosing, not less than ¾" but not more than 1 ¼", shall be provided on stairways with solid risers.

Headroom

The minimum headroom in all parts of the stairway shall be not less than 6 feet 8 inches measured vertically from the sloped plane adjoining the tread nosing or from the floor surface of the landing or platform.

Illumination

All interior and exterior stairs shall be provided with illumination to the stairs including the landing.

Under Stairs Protections

Enclosed accessible space under stairs shall have walls, under stairs surface and any soffits protected on the enclosed side with ½ inch gypsum board.

Handrails

Handrails shall be provided on at least one side of each continuous run of treads or flight with three or more risers. Handrail height, measured vertically from the sloped plane adjoining the tread nosing, or finish surface of ramp slope, shall be not less than 34 inches and not more than 38 inches. Handrails for stairways shall be continuous for the full length of the flight, from a point directly above the top riser of the flight to a point directly above the lowest riser of the flight. Handrail ends shall be returned or shall terminate in newel posts or safety terminals. Handrails adjacent to a wall shall have a space of not less than 1 ½ inch between the wall and the handrails. All required handrails shall be of one of the following types or provide equivalent graspability.

1. **Type I.** Handrails with a circular cross section shall have an outside diameter of at least 1 ¼ inches and not greater than 2 inches. If the handrail is not circular, it shall have a perimeter dimension of at least 4 inches and not greater than 6 ¼ inches with a maximum cross section dimension of 2 ¼ inches. Edges shall have a minimum radius of 0.01 inch.
2. **Type II.** Handrails with a perimeter greater than 6 ¼ inches shall have a graspable finger recess area on both sides of the profile. The finger recess shall begin within a distance of ¾ inch measured vertically from the tallest portion of the profile and achieve a depth of at least 5/16 inch within 7/8 inch below the widest portion of the profile. This required depth shall continue for at least 3/8 inch to a level that is not less than 1 3/4 inches below the tallest portion of the profile. The minimum width of the handrail above the recess shall be 1 ¼ inches to a maximum of 2 ¾ inches. Edges shall have a minimum radius of 0.01 inch.

Guards

Guards Required

Porches, balconies or raised floor surfaces located more than 30 inches above the floor or grade below shall have guards not less than 36 inches in height. Open sides of stairs with a total rise of more than 30 inches above the floor or grade below shall have guards not less than 34 inches in height measured vertically from the nosing of the treads.

Guards Opening Limitations

Required guards on open sides of stairways, raised floor areas, balconies and porches shall have intermediate rails or ornamental closures that do not allow passage of a sphere 4 inches in diameter. Required guards shall not be constructed with horizontal rails or other ornamental pattern that results in a ladder effect.

Smoke Alarms

Single & Multiple Station Smoke Alarms

Single and multiple station smoke alarms shall be installed in the following locations:

- a.) In each sleeping room
- b.) Outside of each separate sleeping area in the immediate vicinity of the bedrooms.
- c.) On each additional story of the dwelling, including basements and cellars but not including crawl spaces and uninhabitable attics. In dwellings or dwelling units with split-levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.
- d.) When more than one smoke alarm is required to be installed within an individual dwelling unit the alarm devices shall be interconnected in such a manner that the actuation of one alarm will activate all background noise levels with all intervening doors closed.

Power Source

In new construction, the required smoke alarms shall receive their primary power from the building wiring when such wiring is served from a commercial source, and when primary power is interrupted, shall receive power from a battery.

Carbon Monoxide Alarms

R315.1 Carbon Monoxide Alarms

For new construction, an approved carbon monoxide alarm shall be installed outside of each separate sleeping area in the immediate vicinity of the bedrooms in dwelling units within which fuel-fired appliances are installed and in dwelling units that have attached garages.

R315.2 Where Required in Existing Dwellings

Where work requiring a permit occurs in existing dwellings that have attached garages or in existing dwellings within which fuel-fired appliances exist, carbon monoxide alarms shall be provided in accordance with Section R315.2.

R315.3 Alarm Requirements

Single station carbon monoxide alarms shall be listed as complying with UL 2034 and shall be installed in accordance with this code and the manufacturer's installation instructions.

Foam Plastic

Attics and Crawlspaces

If foam plastic (Styrofoam) is used in any structure, it shall be protected against ignition by one of the following methods:

- a.) 1 ½ inch thick mineral fiber insulation
- b.) 3/8 inch gypsum board or equivalent
- c.) ¼ inch thick plywood, particleboard, or hardboard.
- d.) Corrosion resistant steel having a base metal thickness of .016 inch.

No matter which method is used, it must be installed in a manner that the foam plastic (Styrofoam) is not exposed. The protective covering shall be consistent with the requirements for the type of construction.

Site Address

Premises Identification

R319.1 Address Numbers. Buildings shall have approved address numbers, building numbers or approved building identification placed in a position that is plainly legible and visible from the street road fronting the property. These numbers shall contrast with their background. Address numbers shall be Arabic numbers or alphabetical letters. Numbers shall be a minimum of 4 inches high with a minimum stroke width of ½ inch. Where access is by means of a private road and the building address cannot be viewed from the public way, a monument, pole or other sign shall be used to identify the structure.

Footings and Foundations

General

All exterior walls shall be supported on continuous solid or fully grouted masonry or concrete footings, which shall be of sufficient design to accommodate all loads to the soil within the limitations as determined from the character of the soil. Footings shall be supported on undisturbed or engineered fill. **No concrete shall be poured if temperature is 25°F or below OR if temperature is 105°F or above.**

Minimum Size Footing

Minimum width and thickness of concrete or masonry footings (inches):

1 Story	24" Wide x 8" Thick
2 Story	24" Wide x 8" Thick
3 Story	24" Wide x 10" Thick

Load Bearing Value of Soil (psf) 1500 to 4000

Note: All load bearing footings must be reinforced with a minimum of 2 #4 rebar continuous and tied in place, spaced evenly and placed 3" minimum from bottom of footing. In addition, as a minimum, 1 #4 vertical rebar shall be placed 2 foot on center, placed in the center of the footing/foundation wall. The vertical rebar shall have an 8" L-Shaped hook, as measured from the outside edge of the hook, to the end of the hook. The vertical bar hooked end shall be embedded in the footing 4" to 5", with 16" of rebar rising above the footing. All rebar shall be 40 grade minimum. Mortar shall be type M and S masonry shall be laid in running bond. The distance from the face of the soil side of the wall to the center of vertical reinforcement shall be at least 5 inches for eight inch walls, 6.75 inches for ten inch walls and 8.75 inches for twelve inch walls. Vertical rebar shall extend to within 6 inches from the top of the foundation wall.

Foundations

Reinforced Concrete and Masonry Foundation Walls

<u>Maximum Wall Height</u>	<u>Minimum Vertical/Horizontal Reinforcement Size & Spacing for 8", 10" & 12" Walls in All Soil</u>
4 Foot	Vertical #4 @ 4 Foot on Center Horizontal #4 @ 2 Foot on Center
8 Foot	Vertical #4 @ 2 Foot on Center Horizontal #4 @ 2 Foot on Center
9 Foot	Vertical #4 @ 2 Foot on Center Horizontal #4 @ 2 Foot on Center
Anything Over 10 Foot	Sealed Design by a Professional Required

Foundation Drainage

Drains shall be provided around all concrete or masonry foundations that retain earth and enclose habitable spaces located below grade. Drainage tile, gravel or crushed stone drains, perforated pipe or other approved systems or materials shall be installed at or below the area to be protected and shall discharge by gravity or mechanical means into an approved drainage system.

Foundation Damp Proofing

Foundation walls that retain earth and enclose habitable or usable spaces located below grade shall be damp proofed from the top of the footing to the finished grade.

R408.1 Ventilation

The under-floor space between the bottom of the floor joists and the earth under any building (except space occupied by a basement) shall have ventilation openings through foundation walls or exterior walls. The minimum net area of ventilation openings shall not be less than 1 square foot for each 150 square feet of under-floor space area, unless the ground surface is covered by a Class 1 vapor retarder material. When a Class 1 vapor retarder material is used, the minimum net area of ventilation openings shall not be less than 1 square foot for each 1,500 square feet of under-floor space area. One such ventilating opening shall be within 3 feet of each corner of the building. Access: A minimum access opening of 18 inches by 24 inches shall be provided to the under-floor space.

Footings Supporting Walls of Light-Frame Construction (a,b,c,d)

<u>No. of Floors Supported by the Foundation</u>	<u>Thickness of Foundation Wall Concrete</u>	<u>Thickness of Foundation Wall Unit Masonry</u>	<u>Width of Footing (Inches)</u>	<u>Thickness of Footing (Inches)</u>	<u>Depth of Footing Below Undisturbed Ground Surface</u>
1	8	8	24	8	12
2	8	8	24	8	18
3	10	10	24	8	24

- Where frost conditions are found, footings and foundations shall be as required in Section 1805.2.1
- The ground under the floor is permitted to be excavated to the elevation of the top of the footing.
- Interior stud bearing walls are permitted to be supported by isolated footings. The footing width and length shall be twice the width shown in this table, and footings shall be spaced not more than 6 feet on center.
- See Section 1910 for additional requirements for footings of structures assigned to Seismic Design Categories C, D, E, and F.
- Foundations are permitted to support a floor in addition to the stipulated number of floors. Foundations supporting roofs only shall be as required for supporting one floor.

Wall Construction

Requirements – R601.2

Wall construction shall be capable of accommodating all loads imposed according to Section R301 and of transmitting the resulting loads to the supporting structural elements.

Identification

Load-bearing dimension lumber for studs, plates & headers shall be identified by a grade mark of a lumber grading or inspection agency that has been approved by an accreditation body that complies with DOC PS 20.

Drilling & Notching Studs – R602.6 Any stud in an exterior wall or bearing partition may be cut or notched to a depth not exceeding 25 percent of its width. Studs in nonbearing partitions may be notched to a depth not to exceed 40 percent of a single stud width. Any stud may be bored or drilled, provided that the diameter of the resulting hole is no more than 60 percent of the stud width, the edge of the hole is no more than 5/8 inch to the edge of the stud, and the hole is not located in the same section as a cut or notch. Studs located in exterior walls or bearing partitions drilled over 40 percent and up to 60 percent shall also be doubled with no more than two successive doubled studs bored.

Fire-Blocking – R302.11

In combustible construction, fire-blocking 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.

Fire-Blocking shall be provided in wood-frame construction in the following locations:

- 1.) In concealed spaces of stud walls and partitions, including furred spaces and parallel rows of studs or staggered studs, as follows:
 - 1.1 Vertically at the ceiling and floor levels.
 - 1.2 Horizontally at intervals not exceeding 10 feet.
- 2.) At all interconnections between concealed vertical and horizontal spaces such as at soffits, drop ceilings and cove ceilings.
- 3.) In concealed spaces between stair stringers at the top and bottom of the run. Enclosed spaces under stairs shall comply with Section R302.7.
- 4.) At openings around vents, pipes, ducts, cables and wires at ceiling and floor level, with an approved material to resist the free passage of flame and products of combustion. The material filling this annular space shall not be required to meet the ASTM E 136 requirements.
- 5.) For the fire-blocking of chimneys and fireplaces, See Section R1003.19.
- 6.) Fire-blocking of cornices of a two-family dwelling is required at the line of dwelling unit separation.
- 7.) Fire-blocking is required in common wall between the living space and garage at midpoint.

Housewrap

Vapor retarders. R601.3

Class I or II vapor retarders are required on the interior side of frame walls. Exceptions: Basement walls, below grade portion of any wall, or construction where moisture or its freezing will not damage the materials.

Narrow Wall Bracing

Method PFG: At Garage Door Openings – R602.10.3.4

Where supporting a roof or one story and a roof, alternate braced wall panels constructed in accordance with the following provisions are permitted on either side of garage door openings. For the purpose of calculating wall bracing amounts to satisfy the minimum requirements of Table R602.10.1.2(1), the length of the alternate braced wall panel shall be multiplied by a factor of 1.5.

- 1.) Braced wall panel length shall be a minimum of 24 inches and braced wall panel height shall be a maximum of 10 feet.
- 2.) Braced wall panel shall be sheathed on one face with a single layer of 7/16 inch minimum thickness wood structural panel sheathing attached to framing with 8d common nails at 3 inches on center in accordance with Figure R602.10.3.4
- 3.) The wood structural panel sheathing shall extend up over the solid sawn or glued-laminated header and shall be nailed to the header at 3 inches on center grid in accordance with Figure R602.10.3.4
- 4.) The header shall consist of a minimum of two solid sawn 2 x 12's or a 3 inch x 11.25 inch glued laminated header. The header shall extend between the inside faces of the first full-length outer studs of each panel in accordance with Figure R602.10.3.4. The clear span of the header between the inner studs of each panel shall be not less than 6 feet and not more than 18 feet in length.
- 5.) A strap with an uplift capacity of not less than 1,000 pounds shall fasten the header to the side of the inner studs opposite the sheathing face. Where the building is located in Wind Exposure Categories C or D, the strap uplift capacity shall be in accordance with Table R602.10.4.1.1.
- 6.) A minimum of two bolts not less than ½ inch diameter shall be installed in accordance with Section R403.1.6. A 3/16 inch x 2 ½ inch x 2 ½ inch steel plate washer in installed between the bottom plate and the nut of each bolt.
- 7.) Braced wall panel shall be installed directly on a foundation.
- 8.) Where an alternate braced wall panel is located only on one side of the garage opening, the header shall be connected to a supporting jack stud on the opposite side of the garage opening with a metal strap with an uplift capacity of not less than 1,000 lbs. Where that supporting jack stud is not part of a braced wall panel assembly, another 1,000 lb. strap shall be installed to attach the supporting jack stud to the foundation.

Roof-Ceiling Construction

Identification & Grade

Load bearing dimension lumber for rafters, trusses and ceiling joists shall be identified by a grade mark of a lumber grading or inspection agency that has been approved by an accredited body that complies with DOC PS 20.

Truss Design Drawings

Truss design drawings, prepared in conformance with the International Residential Code, shall be provided to the building official and approved prior to installation.

Chimneys & Fireplaces

Masonry Chimneys

Masonry chimneys shall be supported on foundations of solid masonry or concrete at least 12 inches thick and at least 6 inches beyond each side of the exterior dimensions of the chimney.

Listed materials used as flue linings shall be installed in accordance with the terms of their listings and manufacturer's instructions. Cleanout openings shall be provided within 6 inches of the base of each flue within every masonry chimney.

Factory built chimneys and fireplaces shall be listed and labeled and shall be installed and terminated in accordance with the manufacturer's installation instructions.

An un-vented gas log heater shall not be installed in a factory-built fireplace unless the fireplace system has been specifically tested, listed and labeled for such use in accordance with UL 127.

Factory built masonry fireplaces shall be equipped with an exterior air supply to assure proper fuel combustion unless the room is mechanically ventilated and controlled so that the indoor air pressure is neutral or positive.

Gas Fireplace Shutoff Valve

Each gas fireplace shall be provided with a shutoff valve separate from the appliance. The valve shall be located in the same room as the appliance. The valve shall be located in places so as to provide easy access for operation and shall be installed in a manner so as to be protected from damage.

Mechanical Systems

Appliances shall be accessible for inspection, service, repair and replacement without removing permanent construction, other appliances, or any other piping or ducts not connected to the appliance being inspected, serviced, repaired or replaced. A level working space at least 30 inches deep and 30 inches wide shall be provided in front of the control side to service an appliance. Installation of room heaters shall be permitted with at least an 18-inch working space.

Attics containing appliances requiring access shall have with an opening and a clear and unobstructed passageway large enough to allow removal of the largest appliance, but not less than 30 inches high and 22 inches wide and not more than 20 feet long when measured along the centerline of the passageway from the opening to the appliance. The passageway shall have continuous solid flooring in accordance with Chapter 5 not less than 24 inches wide.

Equipment installed outdoors shall be listed and labeled for outdoor installation. Supports and foundations shall prevent excessive vibration, settlement or movement of the equipment. Supports and foundations shall be level and conform to the manufacturer's installation instructions.

Equipment shall be installed with a maximum height of THREE FEET from finish grade.

Clothes dryer exhaust systems shall be independent of all other systems. Shall convey the moisture to the outdoors and shall terminate on the outside of the building. Exhaust duct terminations shall be in accordance with the dryer manufacturer's installation instructions. Screens shall not be installed at the duct termination. Exhaust ducts shall not be connected with sheet metal screws or fastening means which extend into the duct. Exhaust ducts shall be equipped with a back draft damper. Exhaust ducts shall be constructed of minimum 0.016-inch thick rigid metal ducts, having smooth interior surfaces with joints running in the direction of air flow. Flexible transition ducts used to connect the dryer to the exhaust duct system shall be limited to single lengths, not to exceed 8 feet in length and shall be tested and labeled in accordance with UL 2158A.

Plumbing

Water Distribution Pipe

The following shall not be used for water distribution piping:

- 1.) PE-AL-PEX pipe
- 2.) PE-AL-HDPE
- 3.) PE-AL-PE pipe

Inaccessible water distribution piping under concrete slabs shall be copper Type K, brass, or ductile iron pressure pipe, all to be installed with approved fittings or bends. The minimum pressure rating tubing installed under slabs shall be 100 psi at 180°F.

Main Vent Stack

Every building shall have a main stack vent a minimum of 3 inches in diameter that is either a vent stack or a stack vent. Such shall run undiminished in size and as directly as possible from the building drain through to the open air above the roof. All other vents shall be no less than 2 inches in diameter. Every vent stack or stack vent shall terminate to the open air outside. Open vent pipes that extend through a roof shall be terminated at least 12 inches above the roof.

All sump pumps piping shall be piped to discharge to the outside only. DISCHARGE FROM A SUMP PUMP INTO A SANITARY SEWER IS PROHIBITED.

Rough Plumbing – Testing

Water Test. Each section shall be filled with water to a point not less than 10 feet above the highest fitting connection in that section, or to the highest point in the completed system. Water shall be held in the section under test for a period of 15 minutes. The system shall prove leak free by visual inspection.

Air Test. The portion under test shall be maintained at a gauge pressure of 5 pounds per square inch or 10 inches of mercury column. This pressure shall be held without introduction of additional air for a period of 15 minutes.

THERE SHALL BE A SHUT-OFF INSTALLED BEFORE AND AFTER THE WATER METER AND A FLOOR DRAIN WITHIN FIVE FEET OF THE METER.

Electrical

Services

- 1.) One service per building. **EXCEPTIONS:** Fire pumps, emergency power and lights, multiple occupancy buildings, amperage capacity requirements, and buildings of a large area.
- 2.) Feeder and branch circuits cannot be installed in the same raceway with service conductors.
- 3.) Overhead services – Above roofs – 8 ft. minimum, 3 ft. in all directions from the edge of the roof. **EXCEPTIONS:** Roofs with slopes greater than that of 4/12, 3 ft. minimum. Conduits through roof for service connection, 18 inch minimum.
- 4.) Ground to service drop
 - a. 0 – 150 volts to ground, 10 ft. at electric service entrance to building, also above areas or sidewalks accessible only to pedestrians.
 - b. 151 – 300 volts to ground, 12 ft. over residential properties and driveways, and areas not subject to truck traffic.
 - c. 301 – 600 volts to ground, 18 ft. wires over public streets. Roads, alleys, commercial driveways, and land used by farm equipment.
- 5.) Service through roof.
 - a. 3 ft. maximum, if more height is necessary conduit will need to be secured.
 - b. 100-amp service - 1 ½" or 2" rigid metal conduit.
 - c. 200-amp service - 2" rigid metal conduit.
 - d. Conduit strapped within 3 ft. of meter base and every 5 ft. thereafter.
- 6.) Underground service.
 - a. Always in conduit.
 - b. Expansion joint below meter base, where the length of the run is more than 25 feet.
 - c. 24" depth

METER BASE HEIGHT – 3 FT. TO 5 FT. 6 INCHES FROM FINISH GRADE.

Areas Where Receptacles are Required

1. Island counter space
2. Peninsular counter space
3. Next to each bathroom sink
4. Two receptacles not more than 6 ft. 6 inches above grade, one in front and one in back of house.
5. Laundry area
6. Basement
7. Garage
8. Hallways at least 10 ft. long.

Areas Where GFI Receptacles are Required

1. All counter-top receptacles
2. All bathroom receptacles
3. All garage receptacles – except ceiling mounted receptacles for garage door openers.
4. All outdoor receptacles.
5. Crawl space receptacles
6. All unfinished basement receptacles – except for receptacles dedicated for specific appliances.
7. Wet bar receptacles within 6 ft. of the sink
8. Island counter space receptacles
9. Peninsular counter space receptacles

Kitchen should have:

1. 2 (Two) dedicated circuits to above counter GFI receptacles
2. 1 (One) dedicated circuit to refrigerator
3. 1 (One) dedicated circuit to garbage disposal
4. 1 (One) dedicated circuit to microwave
5. 1 (One) dedicated circuit to dishwasher
6. 1 (One) dedicated circuit to range
7. 1 (One) dedicated circuit to range hood

Stairways and long hallways should be on three or four-way switches.

Missouri One-Call

Missouri One Call is now called MISSOURI 811.

Missouri law requires that any person making or beginning any excavation notify all underground facility owners/operators which may be affected. Any digging projects from digging footings for a building to planting a tree or putting in a fence, you need to contact Missouri 811 at least 3 working days before you start digging. Just follow these simple rules:

- 1.) Request a utility locate online or by phone at 811 at least three full working days prior to excavation.
- 2.) Missouri 811 will notify any public utility companies within your dig site while you wait the required time.
- 3.) The utilities will locate and mark their lines, or provide an all clear notification.
- 4.) You confirm the marks and utility statuses.
- 5.) Dig with care!

Be prepared to answer questions when you call for a locate or contact them on-line. You will be asked who the property owner is and who is doing the work, the expected date of the project, the address of the property, the county, city, and nearest cross street to the dig site. They also need to know where on the property you will be digging, such as the left rear corner of the house, what the estimated depth is that you need to dig, what you will be doing there such as putting in a pool or digging footings for a shed, and what you will be using to dig with like a back hoe or a shovel.

Remember – dial 811 or go on-line at Missouri-811.org BEFORE YOU DIG!!!

Building Permit Fees

New Residential Building Permit Fees

There is an Administrative Fee of \$25.00 for every residential permit. Currently, our Permit Fee Multiplier is .0035. To figure out residential permit fees, the City of Union is on the 2021 Codes therefore we use the BOCA Fee Schedule for 2021. The formula is:

(Gross Area x Square Foot Construction Cost (per schedule) x Permit Fee Multiplier)

EXAMPLE:

You are building a new single-family dwelling. There is 1800 sq. ft. of living space, 1800 sq. ft. unfinished basement, and a 576 sq. ft. garage. Per the 2021 fee schedule, residential 1 & 2 family homes with 5B Construction is \$167.37 per square foot. Unfinished basements are \$31.50 per sq. ft. and garages are \$66.48 per sq. ft.

1800 sq. ft. living space x \$167.37 x .0035 = \$1054.43

1800 sq. ft. unfinished basement x \$31.50 x .0035 = \$198.45

576 sq. ft. garage x \$66.48 x .0035 = \$134.02

Calculate -	\$1054.43 sq. ft. living
	\$ 198.45 sq. ft. basement
	\$ 134.02 sq. ft. garage
	<u>\$ 25.00 administrative fee</u>

\$1,411.90 Total Building Permit Fee (Not including Water and Sewer)

Water & Sewer Permit Fees

Water and sewer fees are based on a flat permit fee. The cost of the water meter and reader, fittings & equipment, the tap fee, an inspection fee and an administrative fee is what makes up the water fee. The sewer fee is the tap and fittings, an administrative fee and an inspection fee. These fees will be added to the building permit fee.

Residential Alterations/Additions:

The permit fee for residential alterations or additions will be the total construction cost x permit fee multiplier plus \$25.00.

EXAMPLE:

You are finishing your basement. Total construction cost is \$26,000.00.

\$26,000 x .0035 = \$91.00

\$91.00 + \$25.00 = \$116.00

Total permit fee for finishing your basement is \$116.00.

You do not need a permit to put a new roof on your house, install cabinets, install flooring, changing faucets, changing out a hot water heater, changing out an electric HVAC system as long as it is the same size, pouring concrete, painting, installing tile, landscaping, etc.

You WILL need a permit to do anything structural (like build walls, etc.), any adding or changing electric (such as adding receptacles or upgrading your panel), and any plumbing work like adding a toilet and shower in the basement or adding a sink in an island. If you are unsure if you need a permit, PLEASE call and ask. If it is after hours or we are busy with another customer, please leave us a message and we will return your call as soon as possible. (636) 583-1805.

PERMITS ARE GOOD FOR ONE YEAR FROM THE DATE OF ISSUANCE.

Right of Way Permits (Excavation Permits)

Any excavation that involves a city street, sidewalk or curb and gutter requires a Right of Way Permit.

A non-refundable fee of \$25.00 shall be paid for any Right of Way Permit. Fees for asphalt and concrete vary and prices will reflect that. Currently, asphalt replacement is \$5.00 per square foot. Sidewalks or concrete street repairs are \$6.00 per square foot. Concrete curb and gutter is \$22.00 per linear foot.

You must call the city at (636) 583-1805 to let us know you will be digging in the street. We will need to know the location, the date when the project will start and the reason for the project.

Example:

My name is Joe from Joe Doe's Plumbing. We will be replacing a sewer line at 1234 Five Street on April 30th and will need to cut into the street to get to the sewer main. Our address is 6789 Ten Street and our phone number is (123) 456-7890.

**ALL WATER AND SEWER CONNECTIONS MUST BE INSPECTED BY THE
CITY OF UNION WATER DEPARTMENT PRIOR TO BACKFILLING THE
DITCH. PLEASE CALL (636) 583-3522 OR (636) 583-1805 FOR INSPECTIONS.**

When the project is complete, the street superintendent will come by and measure the area that will need to be paved and if there are any sidewalk sections or curb and gutter that needs to be replaced. When your permit fee is calculated, we will mail you a copy with the amount due.

All city streets must be saw-cut. If the city has to saw-cut the street, the permit holder will be billed for the use of the saw and compressor plus any labor associated with the job.

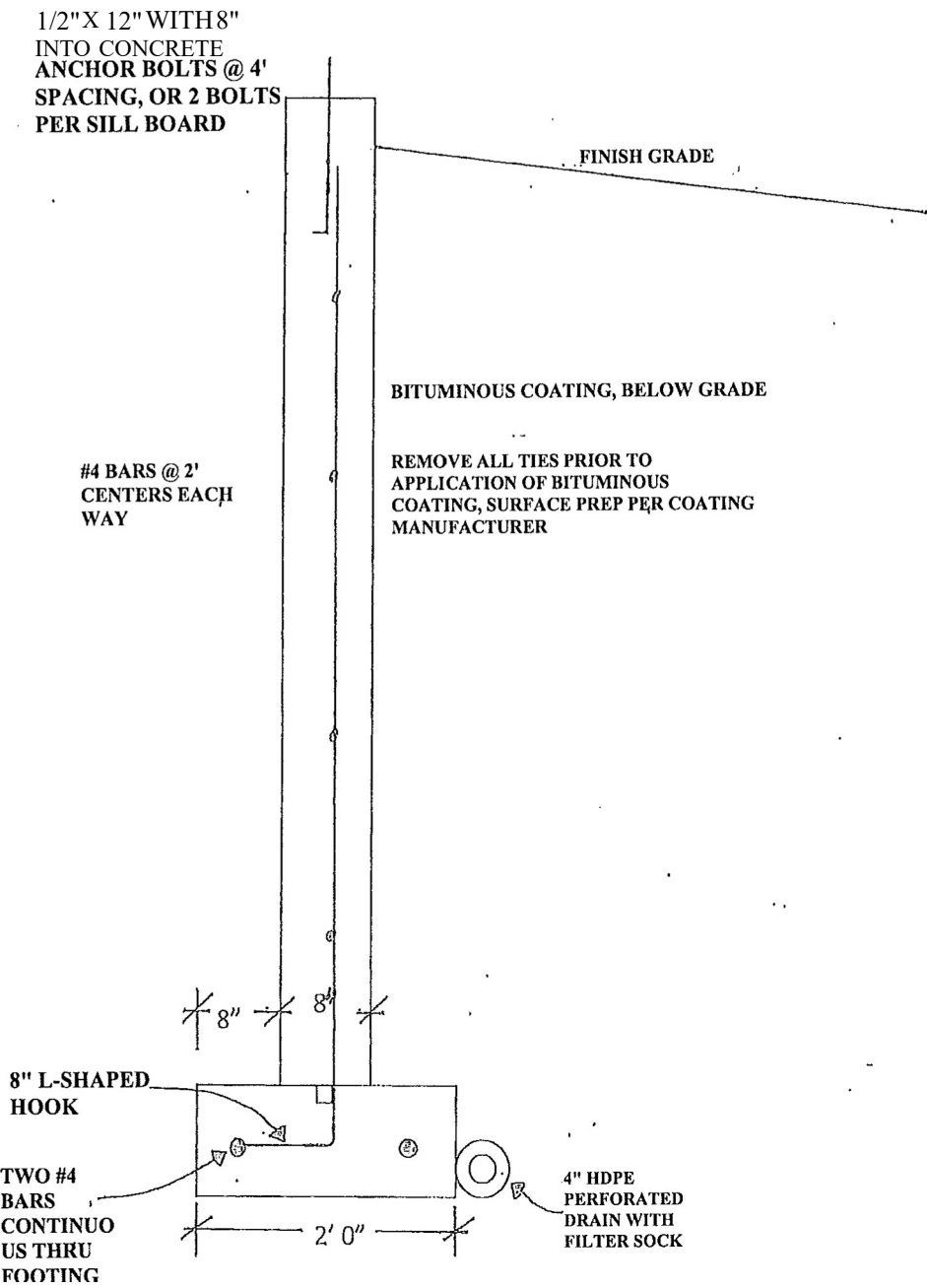
Demolitions

Any building being torn down in the City of Union that is over 200 square feet will need to be reported to the City Hall Building Department. The phone number is (636) 583-1805.

If the area of the structure of demolition is not free of debris within 5 days, the City shall remove all debris from the demolition site and the owner/contractor will be required to pay the costs incurred.

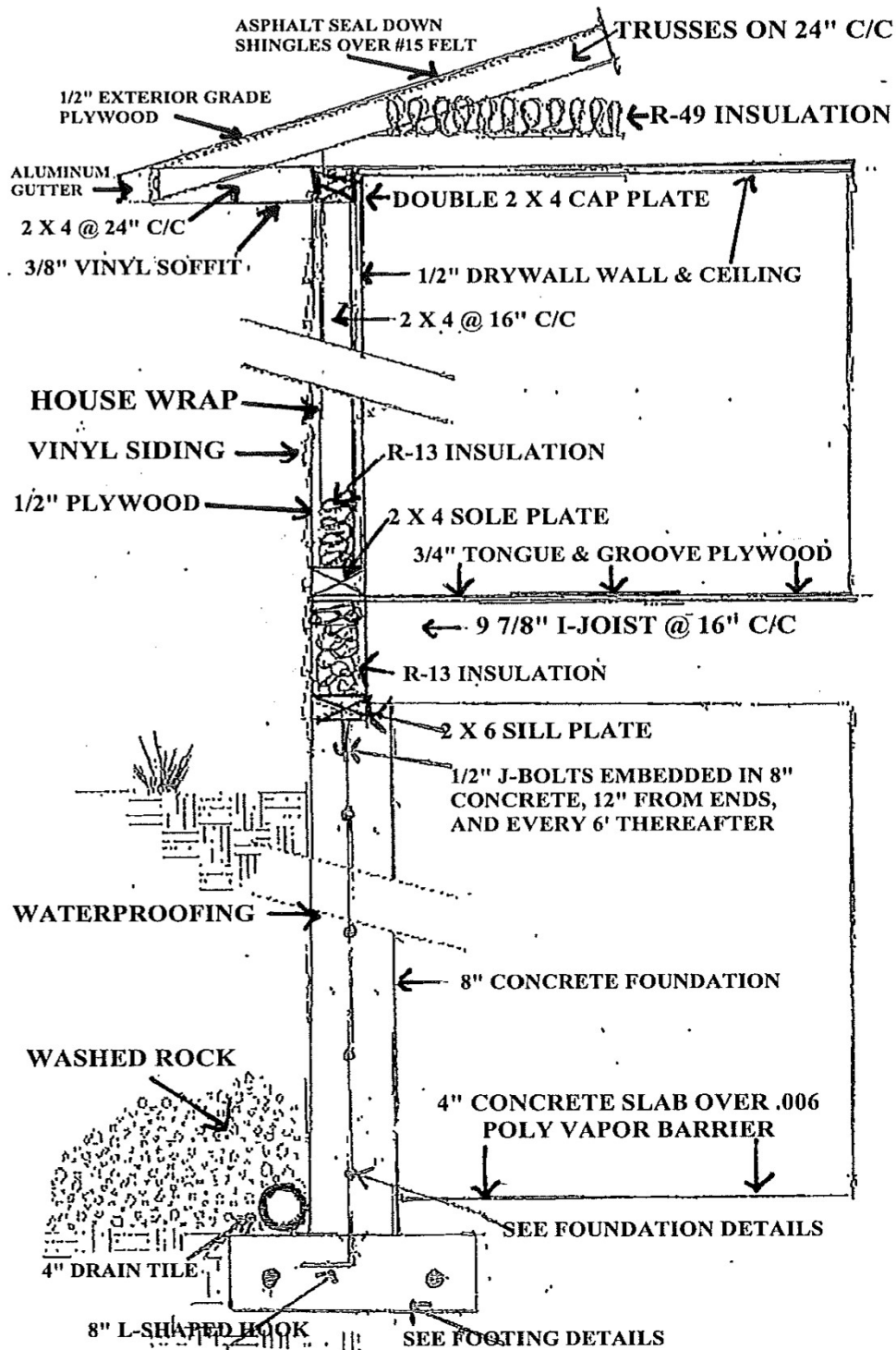
The demolition of any structure which contains asbestos, lead or other hazardous materials, must be performed in accordance with the Missouri Department of Natural Resources regulations. In the event asbestos, lead or other hazardous waste is present, please provide documentation from the Missouri Department of Natural Resources under Chapter 260 RSMo. Such waste, in types and quantities established by the Department, shall be taken to a demolition or sanitary landfill for disposal.

FOOTING/FOUNDATION DETAIL

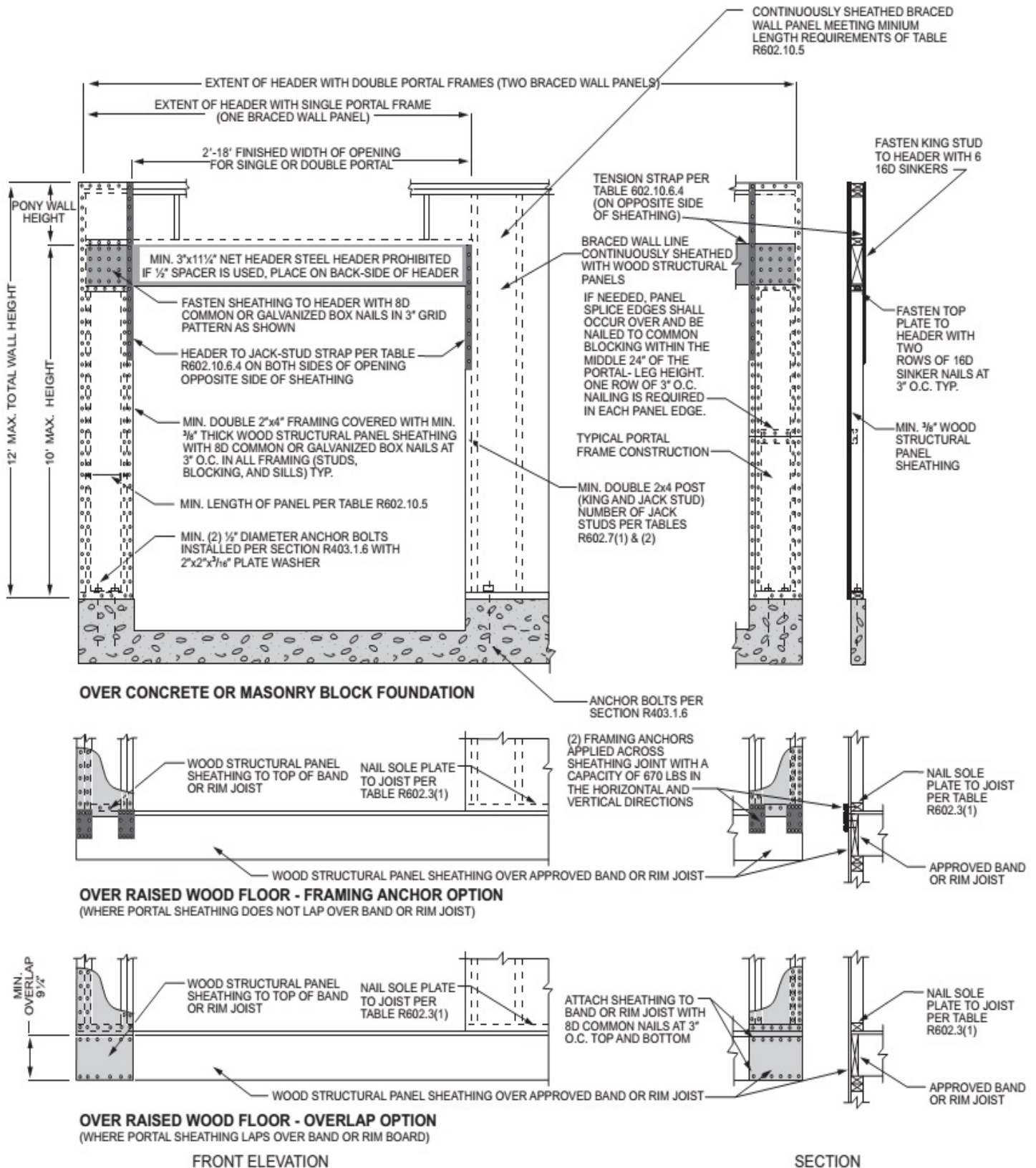


All rods must be tied in place
All forms must be sprayed before set-up

WALL DETAIL

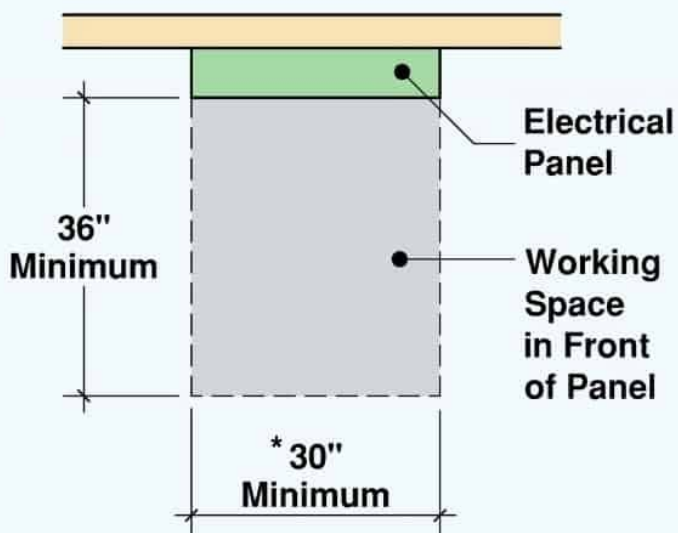


NARROW WALL BRACING



ELECTRICAL PANEL CLEARANCE

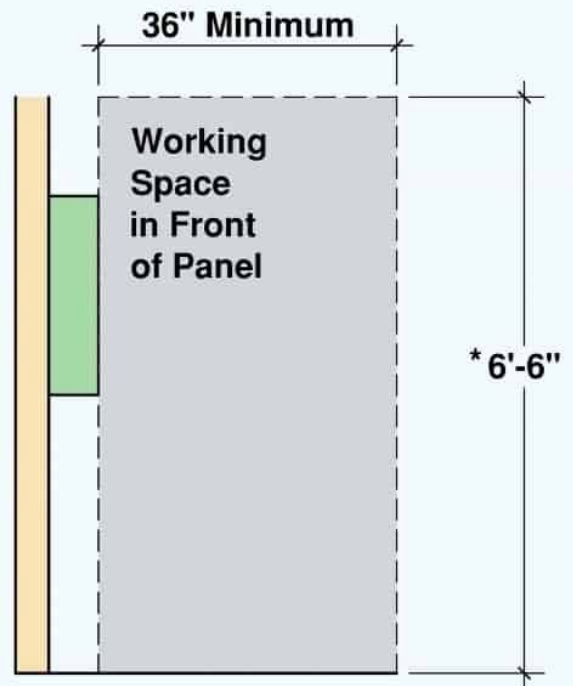
TOP VIEW



* Not less than 30" and not less than the width of the panel.

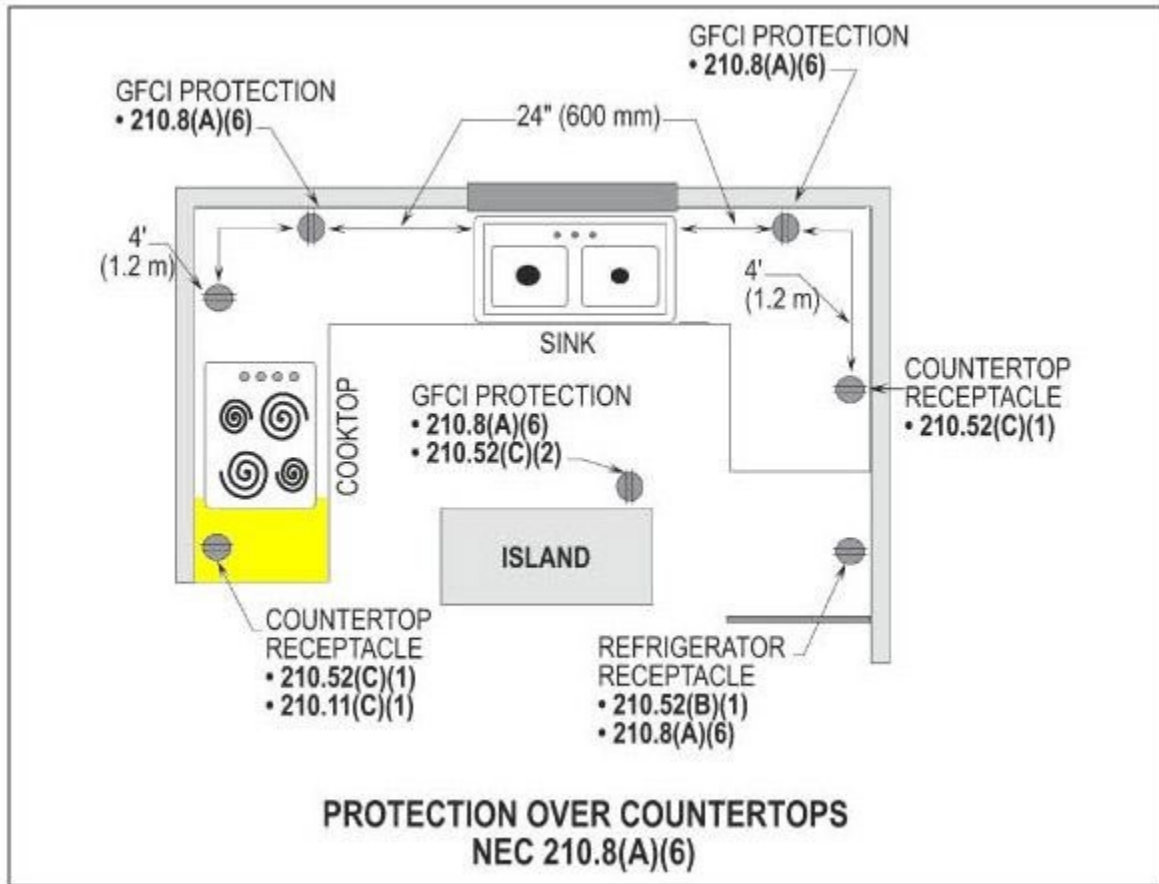
SIDE VIEW

BCIT BUILDING CODE
TRAINER



* Not less than 6'-6" or to the height of the panel, whichever is greater.

KITCHEN COUNTERTOP GFI RECEPTACLE LOCATION

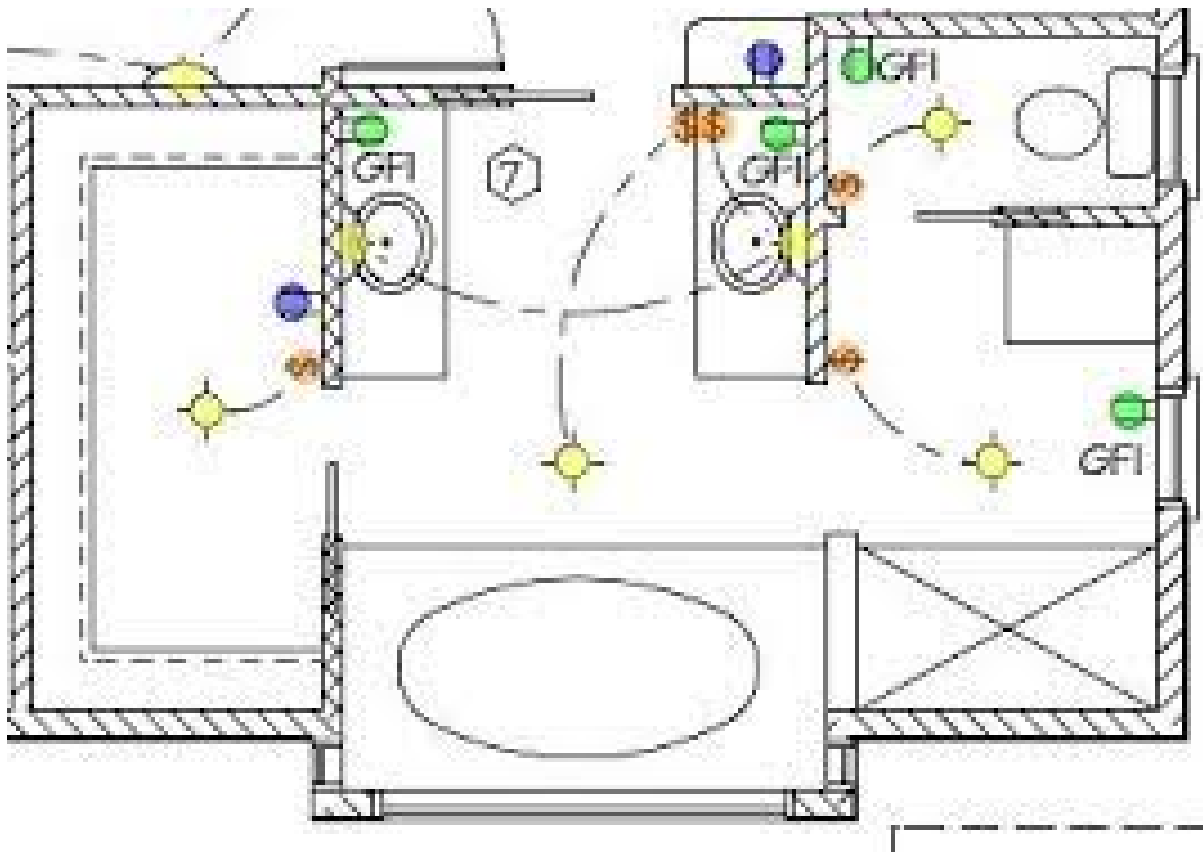


Receptacle outlets shall be installed so that no point along the wall line is more than 24", measured horizontally, from a receptacle outlet in that space.

At least one receptacle outlet shall be provided for the first 9 sq. ft., or fraction thereof, of the countertop or worksurface. A receptacle outlet shall be for every additional 18 sq. ft. or fraction thereof.

At least one receptacle outlet shall be located within 2 feet of the outer end of a peninsular countertop or workstation. Additional required receptacle outlets shall be permitted to be located as determined by the installer or owner. (A peninsular countertop shall be measured from the connected perpendicular wall.)

GFI LOCATIONS IN BATHROOMS



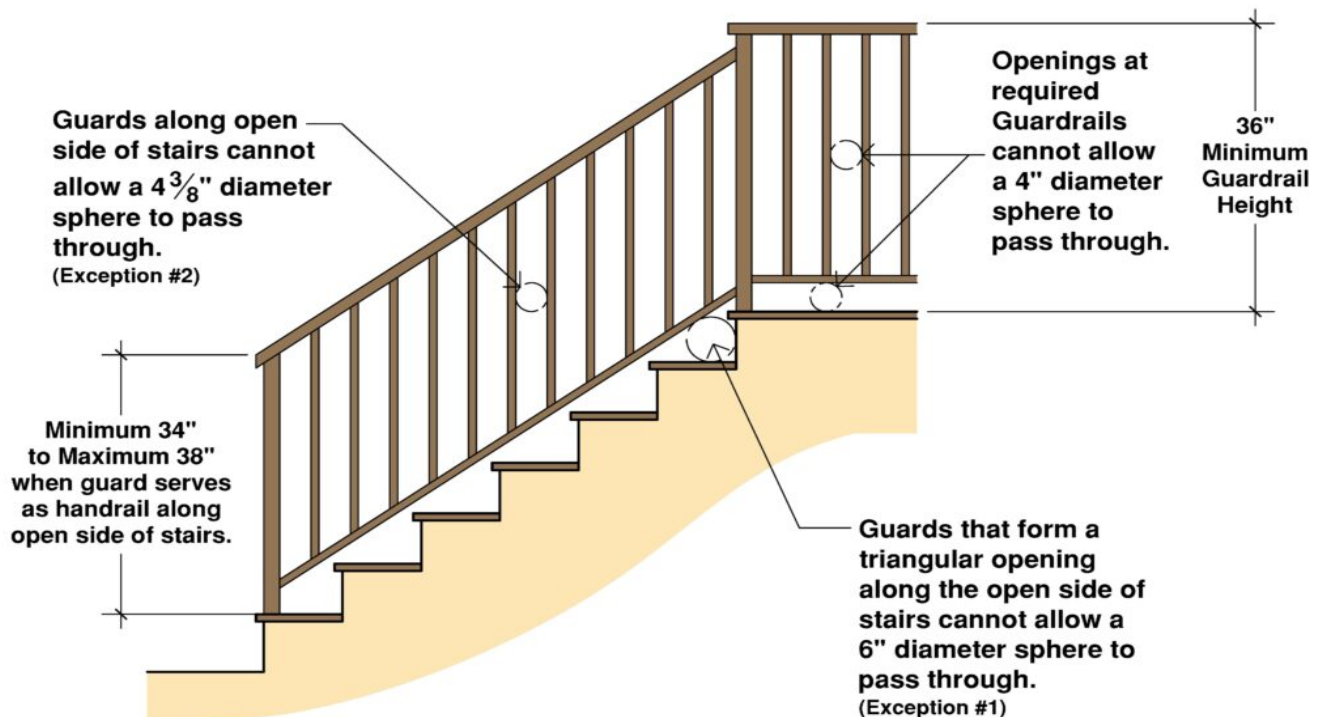
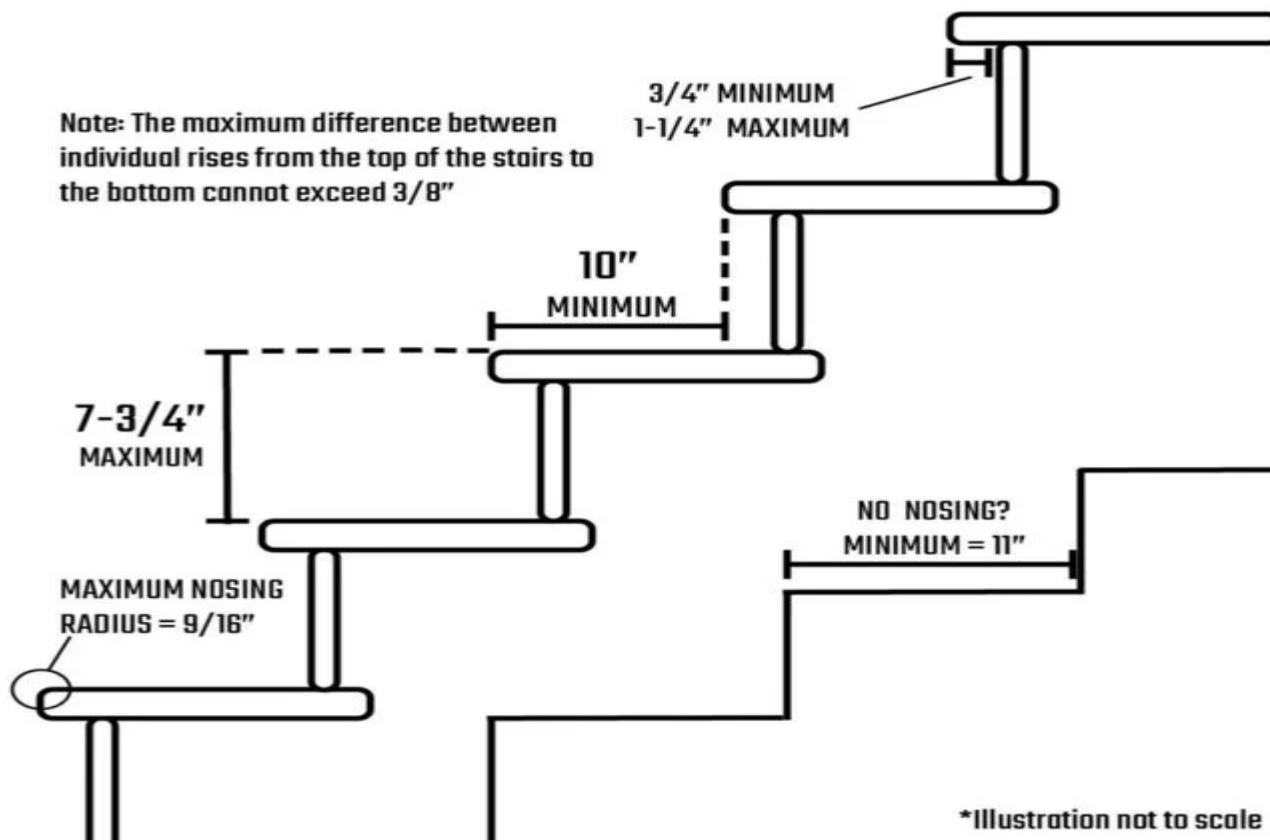
Green = GFI

Yellow = Overhead lighting

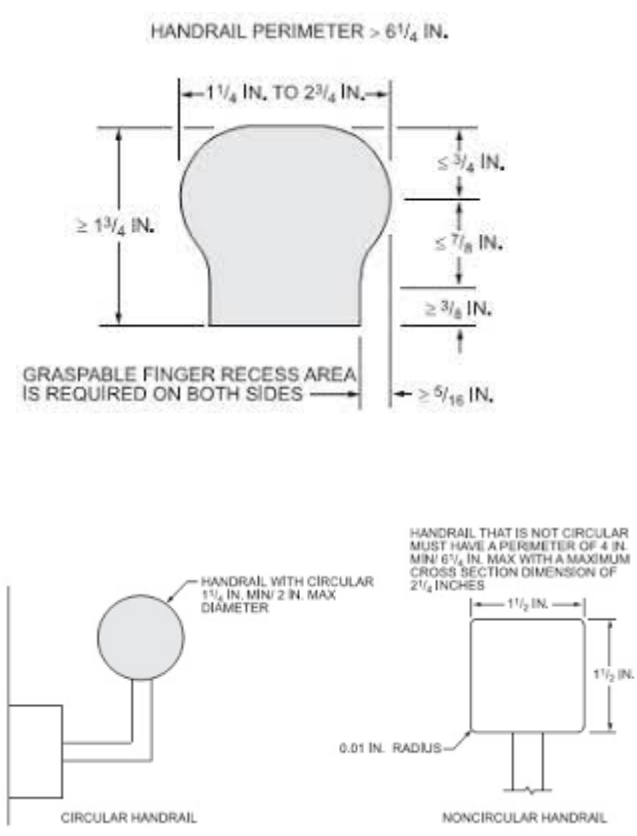
Orange = Light switch

All bathroom receptacles must be GFI protected. If you have dual sinks, you can put a GFI receptacle next to each sink or you can locate one in the center of the two sinks. Receptacles need to be within three (3) feet of the outside edge of the basin.

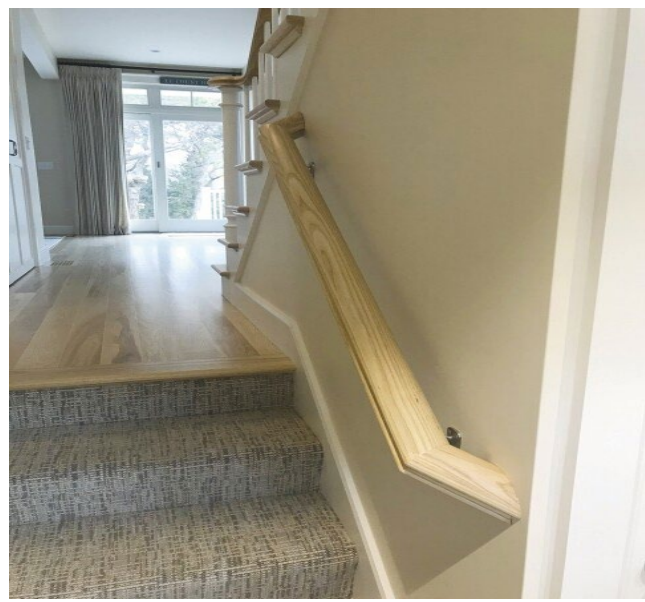
TYPICAL RESIDENTIAL STAIR DETAIL



TYPICAL HANDRAIL DETAIL

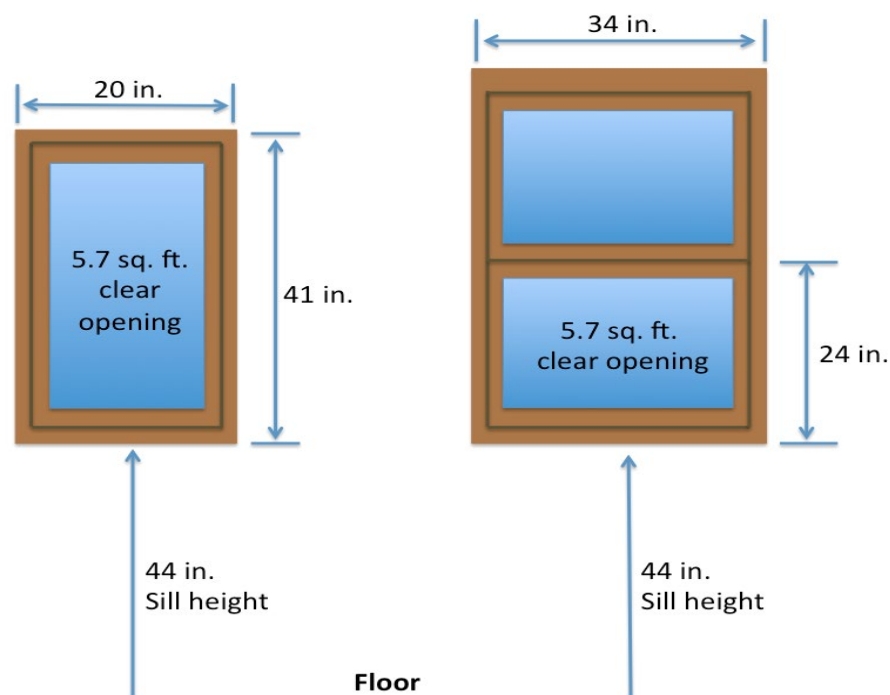


HANDRAILS TO BE
CONTINUOUS FROM TOP
TO BOTTOM AND
TERMINATE IN THE WALL.



RESIDENTIAL EMERGENCY ESCAPE WINDOW

Egress Code: Minimum Size Requirements

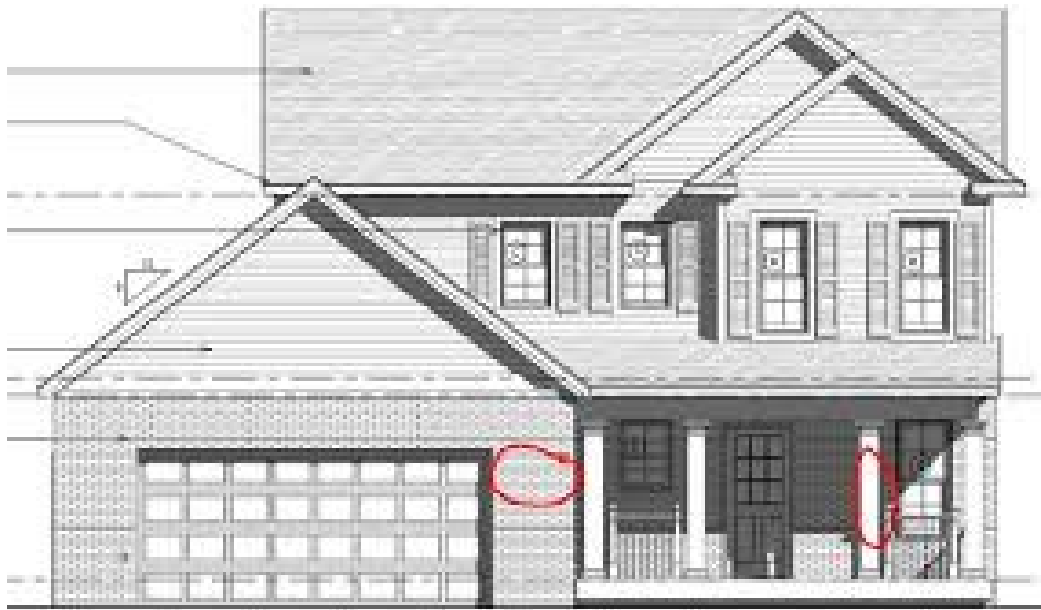


EGRESS WINDOW CHART

FULL EGRESS WINDOW DIMENSIONS (minimum 5.7 square feet - 820.8 square inches)

		WIDTH (inches)															
		20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
HEIGHT	24	480	504	528	552	576	600	624	648	672	696	720	744	768	792	816	840
	25	500	525	550	575	600	625	650	675	700	725	750	775	800	825	850	875
	26	520	546	572	598	624	650	676	702	728	754	780	806	832	858	884	910
	27	540	567	594	621	648	675	702	729	756	783	810	837	864	891	918	945
	28	560	588	616	644	672	700	728	756	784	812	840	868	896	924	952	980
	29	580	609	638	667	696	725	754	783	812	841	870	899	928	957	986	1015
	30	600	630	660	690	720	750	780	810	840	870	900	930	960	990	1020	1050
	31	620	651	682	713	744	775	806	837	868	899	930	961	992	1023	1054	1085
	32	640	672	704	736	768	800	832	864	896	928	960	992	1024	1056	1088	1120
	33	660	693	726	759	792	825	858	891	924	957	990	1023	1056	1089	1122	1155
	34	680	714	748	782	816	850	884	918	952	986	1020	1054	1088	1122	1156	1190
	35	700	735	770	805	840	875	910	945	980	1015	1050	1085	1120	1155	1190	1225
	36	720	756	792	828	864	900	936	972	1008	1044	1080	1116	1152	1188	1224	1260
	37	740	777	814	851	888	925	962	999	1036	1073	1110	1147	1184	1221	1258	1295
	38	760	798	836	874	912	950	988	1026	1064	1102	1140	1178	1216	1254	1292	1330
	39	780	819	858	897	936	975	1014	1053	1092	1131	1170	1209	1248	1287	1326	1365
	40	800	840	880	920	960	1000	1040	1080	1120	1160	1200	1240	1280	1320	1360	1400
	41	820	861	902	943	984	1025	1066	1107	1148	1189	1230	1271	1312	1353	1394	1435
	42	840	882	924	966	1008	1050	1092	1134	1176	1218	1260	1302	1344	1386	1428	1470

TYPICAL ADDRESS LOCATIONS





Preparedness Action Tip

Make Your House Number Extra Visible



Think placement.
Can add to house exterior, curb, and mailbox.



Think visibility.
Consider size, color contrast, and lighting.

