City of Paducah

Type 5 Construction Guidelines

2018 KRC

The purpose of this guideline is to assist owners, builders and others to meet the general requirements and specifications prescribed in 2018 Kentucky Residential Construction Code (KRC) for a one-story building or structure of conventional light-frame wood construction. When portions of a building or structure of otherwise conventional construction exceed the limits of this guideline or other local ordinances, these portions and the supporting load path shall be designed by a registered design professional licensed in the state of Kentucky.

The Kentucky Residential Code (KRC) is essentially the 2015 International Residential Code for One and Two Family Dwellings published by the International Code Council, Inc., with the specific Kentucky amendments. It provides minimum standards to ensure the public safety, health and welfare insofar as they are affected by building construction, and to secure safety to life and property from all hazards incident to the occupancy of buildings, structures, or premises.
The Kentucky Residential Code is a "mini/maxi" code, in that it establishes minimum and maximum building code requirements for detached single-family dwellings, two-family dwellings and townhouses and local governments shall not adopt or enforce any other building code on these units.

HBC adopted the 2018 Kentucky Building Code ("KBC") and the 2018 Kentucky Residential Code ("KRC"). The 2018 KBC and the 2018 KRC went into effect on Aug. 22, 2018. The mandatory effective date for the 2018 KBC and the 2018 KRC is Jan. 1, 2019.
The 2018 KRC may be purchased through NASCLA by calling 1-623-587-9519 or 1-623-587-9354 or going online at www.nascla.org

This handout is for general informational purposes only, and is not a substitute for the full code text. If discrepancies arise, the code shall govern.

Fire Prevention Division
300 South 5th Street
Paducah Kentucky 42003
270-444-8527
www.paducahky.gov

PADUCAH
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City of Paducah Type 5 Residential Construction General Notes:

1. The approved construction documents and correction list(s) shall be available on site. R106.3.1
2. All footings/foundations shall be constructed in compliance with requirements for Seismic Zone D2. R403
3. A 6 mil. Vapor barrier shall be installed under floor slabs and on grade in crawl spaces. R506.2.3
4. The garage shall be separated from the residence and its attic area by a minimum of ½" gypsum board applied to the garage side. Garages beneath habitable rooms shall be separated from such room by no less that 5/8" type X gypsum board and supporting walls shall be protected by ½" gypsum. R302.6
5. The door separating the garage and living area shall be a minimum of 1-3/8" thick solid core wood or 1-3/8" hollow core or honeycomb steel or 20min. fire rated.R302.5.1
6. Smoke alarms shall be installed in each sleeping room and in the vicinity outside of each sleeping room(s). Each smoke alarm shall be 120 volt powered with battery backup and interconnected in a series. A household fire alarm system installed in accordance with NFPA 72 shall provide the same level of smoke detection and alarm as required in the event the fire alarm panel is removed. R314
7. Carbon monoxide alarms shall be provided in dwelling units containing fuel-fired appliances and or the presence of an attached garage with an opening that communicates with the dwelling unit. R315.1
8. Raised walking surfaces more than 30" above grade or floor below shall be equipped with guard rails of at least 36" in height. Open spaces between elements of guards shall not allow a 4" diameter sphere to pass through. R312.1-R312.2 When Required: Handrails shall be provided on at least one side of each continuous run of treads or flight with four or more risers. Height: 34" – 38". Handrails shall be continuous for the full length of the stairs and handrails ends shall be returned or terminate in newel posts or safety terminals. Handrails shall have a space of not less than 1 ½" between a wall and the handrail. Circular handrails shall have a diameter of 1 ¼" – 2". Non noncircular handrail shall have a perimeter less than 4". If the perimeter is 4" – 6 ¼" shall have a maximum cross section of 2 ¼". If the perimeter is greater than 6 ¼" shall have a graspable finger recess area on both sides as described in KRC Section 311.7.8.3 #2.
9. Lighting at interior stairways: treads and landings ≥1 foot-candle. Wall switch at each floor level ≥ 6 risers. Exterior stairways: light source at top landings and bottom landings providing access to a basement.
10. The grade under a house shall be higher than the exterior grade for positive drainage, or a mechanical drainage system must be installed. R408.6
11. Ties for brick veneer shall be installed at 16" OC in both vertical and horizontal directions. R703.8.4
12. Attic ventilation shall be provided R806.1
13. A minimum attic access opening of 22"x30" shall be provided. R807.1
14. A minimum of 15 pound felt underlayment is required for roofing shingles. R905.2.3
15. Fuel burning appliances shall be elevated a minimum of 18" above all garage finish floors R1307.3
16. Masonry chimneys shall be reinforced per D2 seismic requirements. R1001.3
17. Bathroom exhaust fans shall be vented to the exterior with metallic duct work. R303.3
18. Clothes dryer exhaust vent shall terminate to the exterior with metallic ductwork. M1502
19. Rafters and trusses shall be fastened to the top plate with approved connections having resistance to uplift meeting requirements of Table R802.11
20. Handrails shall be provided at all stairways having four or more risers. R311.7.8
21. Crawlspace shall be ventilated at the rate of 1 sf of vent opening per 150 sf of crawl space area. R408.1
22. Under floor space shall be free of vegetation and organic material R408.5
23. Pier foundations shall be capped with a minimum of 4" solid masonry or the cavity filled solid with concrete or grout. R606.6.1
24. A permanent energy conservation certificate shall be posted on/in the electrical panel. It shall list the installed insulating materials and equipment energy efficiency values. N1101.14 (R403.1)
25. Insulation of floors over crawl space is required when crawl space is vented. R1102.2.8
26. Every sleeping room shall have an emergency egress window of 5.7 sf with a maximum height of 44" above the finish floor. When the sill height is less than 44" then 5.0 sf is allowed. R310.1
27. Engineered design can be used for structural elements that exceed the limits in the code; or are not included in the code

28. As an alternative to the requirements in Section R301.1, the following standards are permitted subject to the limitations of the 2018 KRC code. Where engineered design is used in conjunction with these standards the design shall comply with the Kentucky Building Code.

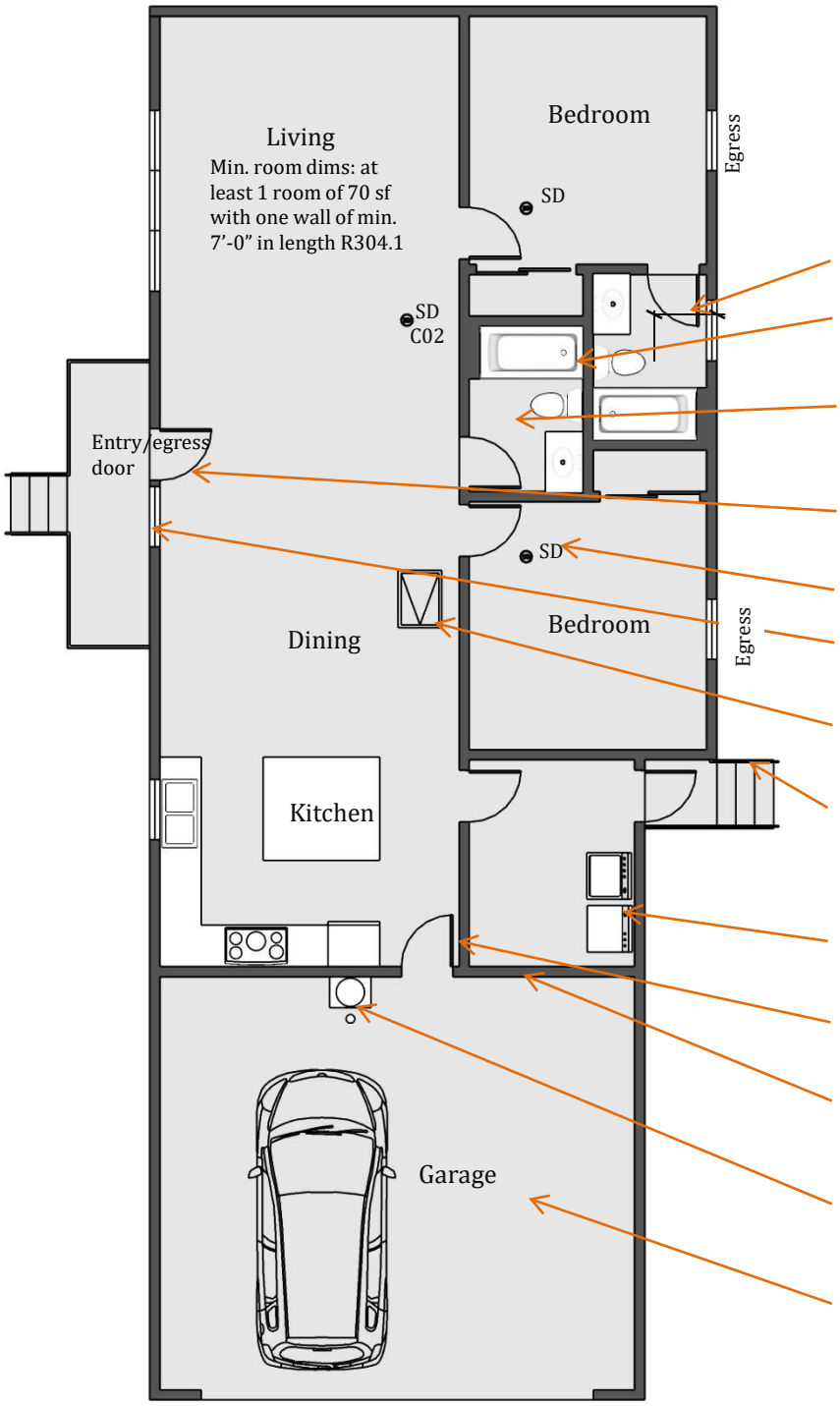
    a. American Forest and Paper Association (AF&PA) Wood Frame Construction Manual (WFCM).
    b. American Iron and Steel Institute (AISI) Standard for Cold-Formed Steel Framing – Prescriptive Method for On and Two-Family Dwellings (COFS/PM) with Supplement to Standard for Cold-Formed Steel Framing – Prescriptive Method for One-and Two-Family Dwellings.
    c. ICC Standard on the Design and Construction of Log Structures (ICC 400).
    d. Federal Emergency Management Administration, Homebuilders' Guide to Earthquake Resistant Construction, FEMA 232-June 2006.
    e. American Wood Council Prescriptive Residential Wood Deck Construction Guide (DCA6).
    f. National Frame Builders Association Post Frame Building Design Manual.

29. Additional codes currently adopted in Kentucky that may impact residential construction.
    - 2015 International Mechanical Code
    - 2009 International Energy Conservation Code (for use with residential buildings only- see definition in IECC)
    - 2009 ICC/ANSI A117.1 Accessible and Usable Buildings and Facilities
    - Kentucky State Plumbing Law, Regulations & Code (815 KAR Chapter 20)
    - 2012 NFPA 54 - National Fuel Gas Code
    - 2017 NFPA 70 - National Electrical Code (effective October 1, 2014)
    - 2015 International Existing Building Code

30. Sealed or Unvented Crawlspace Requirements R408.3

1. Exposed earth is covered with a continuous vapor retarder. Joints of the vapor retarder shall overlap by 6 inches (152 mm) and shall be sealed or taped. The edges of the vapor retarder shall extend at least 6 inches (152 mm) up the stem wall and shall be attached and sealed to the stem wall; and
2. One of the following is provided for the under-floor space:
    a. Continuously operated mechanical exhaust ventilation at a rate equal to 1 cfm (0.47 L/s) for each 50 ft2 (4.7 m2) of crawlspace floor area, including an air pathway to the common area (such as a duct or transfer grille), and perimeter walls insulated in accordance with Section N1102.2.8;
    b. Conditioned air supply sized to deliver at a rate equal to 1 cfm (0.47 L/s) for each 50 ft2 (4.7 m2) of under-floor area, including a return air pathway to the common area (such as a duct or transfer grille), and perimeter walls insulated in accordance with Section N1102.2.8;
    c. Plenum complying with Section M1601.4, if under-floor space is used as a plenum.

All habitable rooms except bathrooms and laundries require natural ventilation by means of openable windows at ≥ 4% the floor area of the room. Natural ventilation my be substituted with mechanical ventilation.
Habitable rooms: Glazing ≥ 8% or lighting ≥ 6 foot-candles. Openings ≥ 4% or mechanical ventilation.
Bathrooms: Glazing ≥ 3 ft or electric lighting. Openings ≥ 1.5 ft2 or mechanical exhaust at 50cfm R303/M1507.4



21" min. in front of toilet

Shower and tub enclosures shall be safety glazing R308.4 Provide 72" high non absorbent finish at shower wall R307.2

Provide mechanical venting with 5 air changes per hour in bathrooms with no operable window

Not less than one egress door shall be provided for each dwelling unit with a clear width of not less than 32". The clear height of the door opening shall be not less than 78 inches. R311.2

Smoke detector, see general notes

All windows within 24" of a door shall have safety glazing R308.4.2

22"x30" attic access or large enough for furnace and equipment to pass through. Min. headroom is 30" above floor R807.1

See general notes for guard and handrail requirements

Dryer vent 4" min. 14' max. with (2) 90 degree bends for metal duct. 6' max. for flexible duct connector. Vent to exterior.

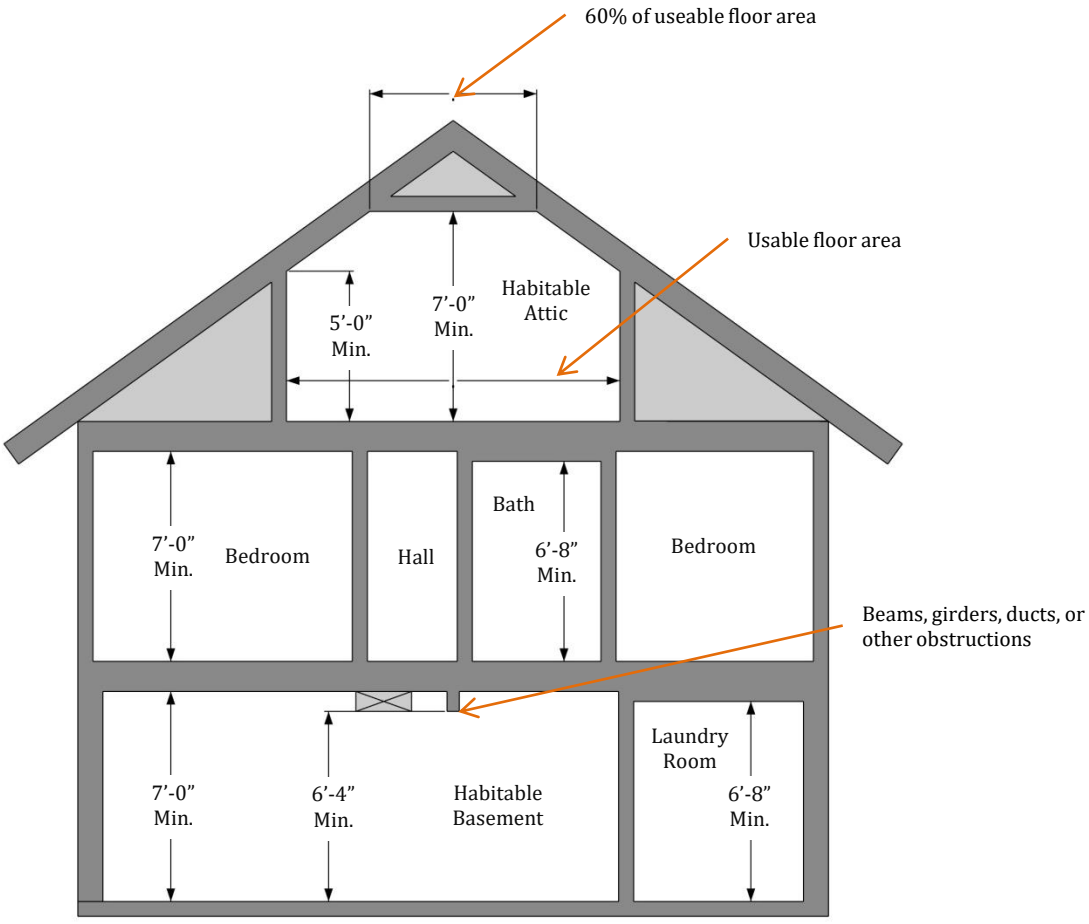
Garage door shall be tight fitting 1-3/8" solid core wood or hollow metal. The garage door shall not open into a sleeping room R302.5.1

Where garages are attached to the residence, the wall on the garage side shall be protected with min. 1/2" type X gypsum board. R302.6

Gas water heater elevated 18" above finish floor and strapped to wall, see page 2. Provide 3" min. diameter pipe bollard or other protective measure when appliances are subject to damage

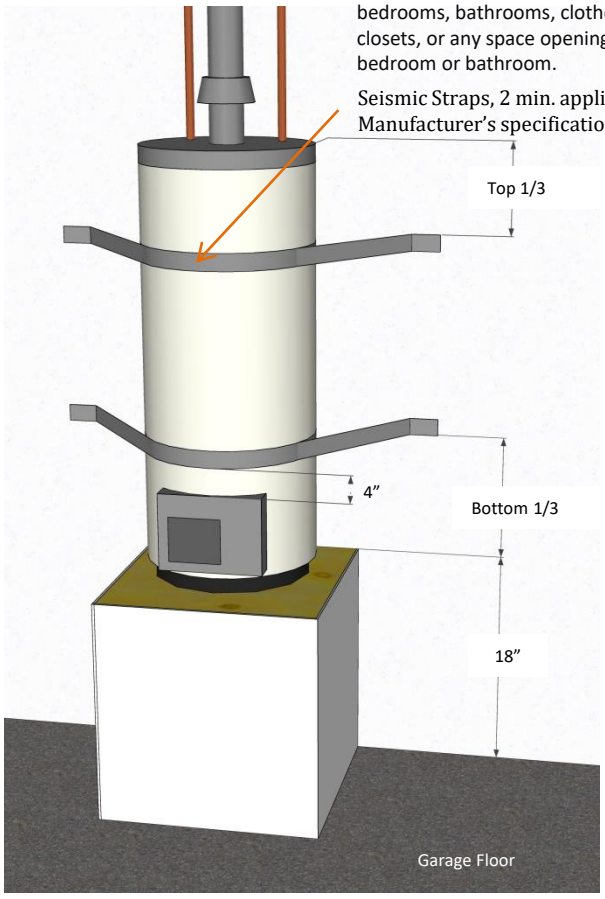
Provide 5/8" type X gypsum ceiling in garages with sleeping rooms above.

Residential Floor Plan
NTS



Residential Section

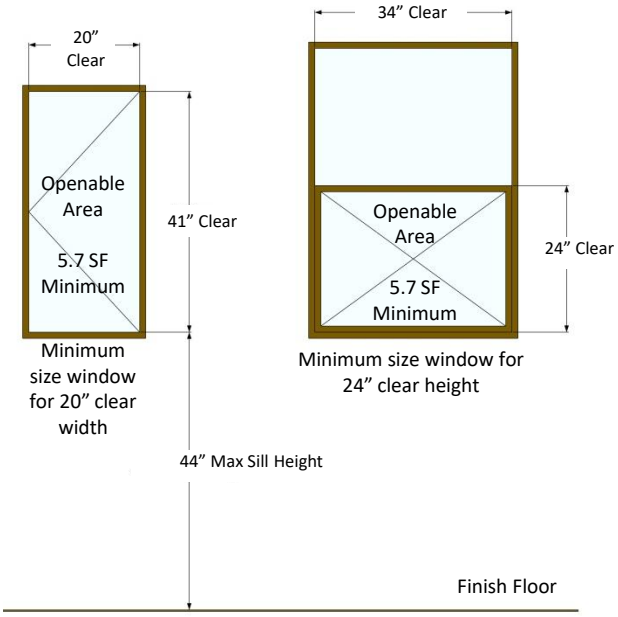
Ceiling Heights
NTS



Water Heater

Gas unit installed in garage

NTS

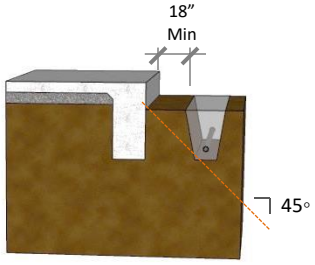


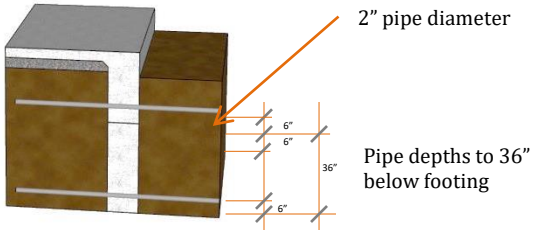
Every sleeping room shall have at least one operable emergency & rescue opening. Basements containing one or more sleeping rooms, emergency egress & rescue openings shall be required in each sleeping room, but not in adjoining basement areas. The net clear opening dimensions shall be obtained by the normal operation of the emergency escape & rescue opening from the inside. Emergency escape and rescue openings shall open directly into a public way, a yard, or court that opens to a public way. R310.1

Sizes shown are taken from data supplied by window manufacturers, however these are general dimensions. It is the owner's responsibility to verify that the actual windows installed meet the minimum egress requirements. Awning, bay with fixed center glazing, single fixed combination window and other types not mentioned above require manufacturer's information if they are to be used to meet emergency egress requirements

Emergency Rescue Openings

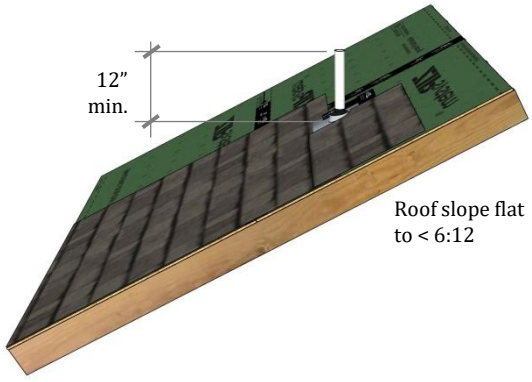
NTS





Trenches/Foundation Penetrations

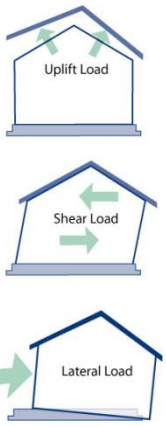
NTS



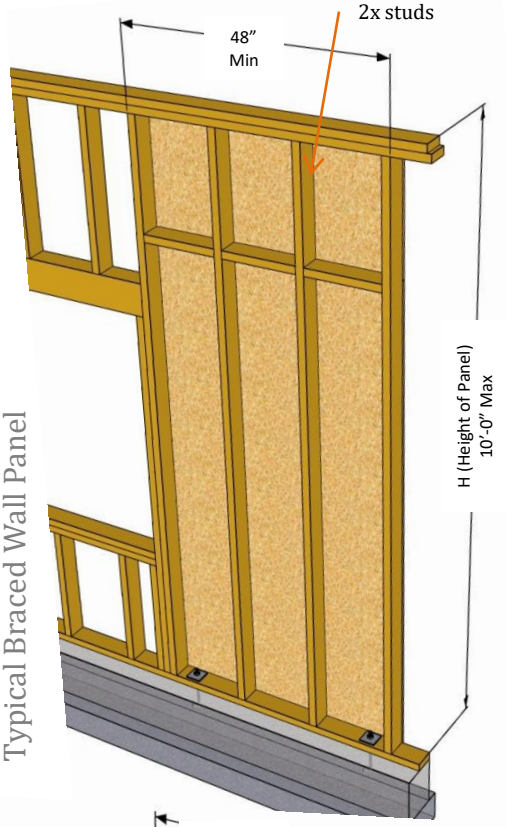
Plumbing Vent/Residential Roof

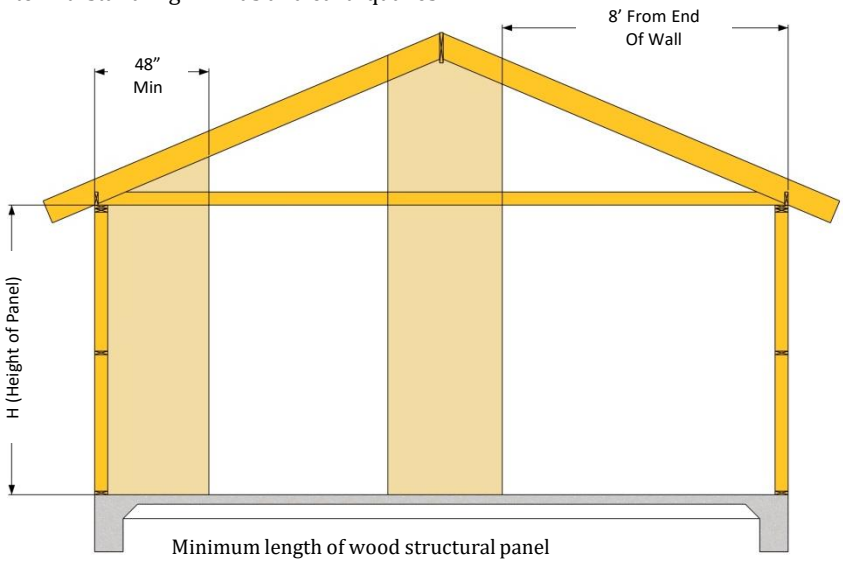
NTS

A house must be built to safely resist the lateral loads that result from high-wind events and earthquakes. Wall studs alone can't resist the racking forces. Wall bracing is a method of providing lateral load resistance to residential structures that helps keep walls square during wind and earthquakes. The overall strength of a building is the function of all of the components: walls, floors, roof, and foundation working together as a unit. When an earthquake or high wind strikes the house, the walls and roof bear the brunt of these forces. A fully sheathed wall of plywood or OSB, properly connected to the foundation and roof, is a strong barrier that resists the forces of wind and earthquakes. Laboratory tests and field evaluations show that sheathing with plywood or OSB can help make a house two to three times more able to withstand high winds and earthquakes.



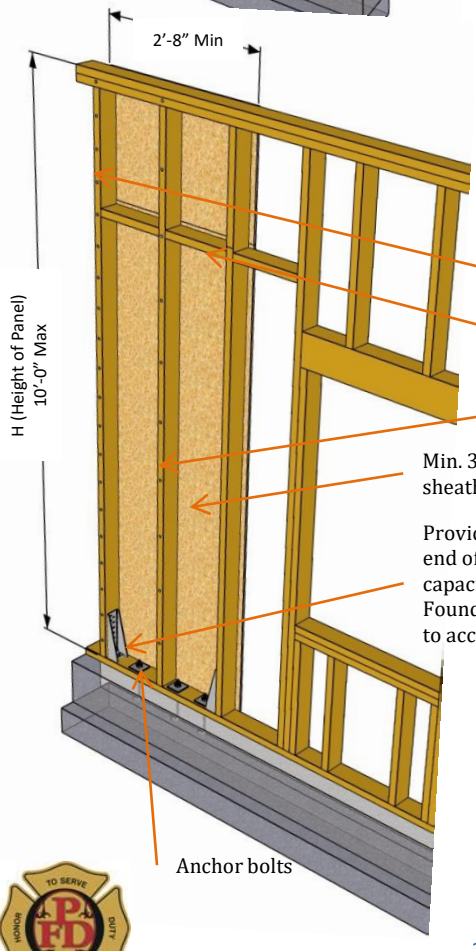
Typical Braced Wall Panel





Minimum length of wood structural panel walls: min. 12'-0" of braced wall length for each 25 lineal ft. of braced wall line.

Alternate Braced Wall Panel



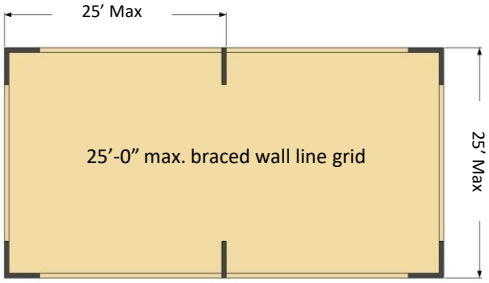
Edge nail 8d common @ 6” oc

Solid block and edge nail all edges if horizontal seam occurs (applies to all braced wall panels and alternative braced wall panels

Field nail 8d common @ 12” oc

Min. 3/8” structural wood panel sheathing

Provide a hold down device at each end of panel with 1,800# min. uplift capacity for 1 story structures. Foundation may have to be modified to accommodate embedment



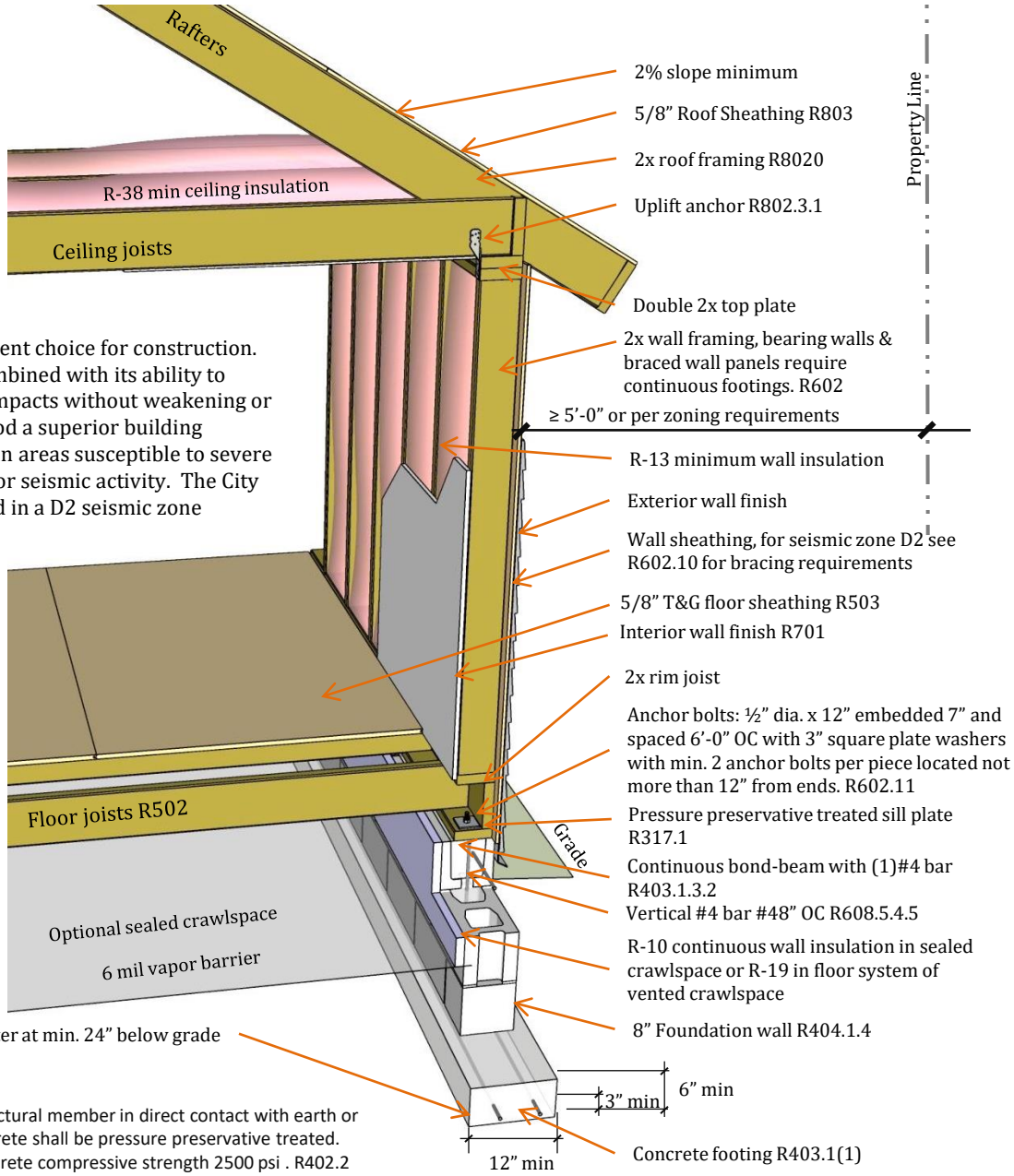
Wall Bracing Diagrams

Seismic Zone D2
NTS

Type 5 Construction

Type 5 construction is a classification of buildings by construction materials and methods. It is the least restrictive permitted by the Kentucky Residential Code and includes light, wood-frame construction. This sheet is for information and reference only and is not a substitute for accurate project specific construction documents

Wood is a very resilient choice for construction. Wood's strength combined with its ability to absorb stresses or impacts without weakening or degrading make wood a superior building material, especially in areas susceptible to severe weather conditions or seismic activity. The City of Paducah is located in a D2 seismic zone

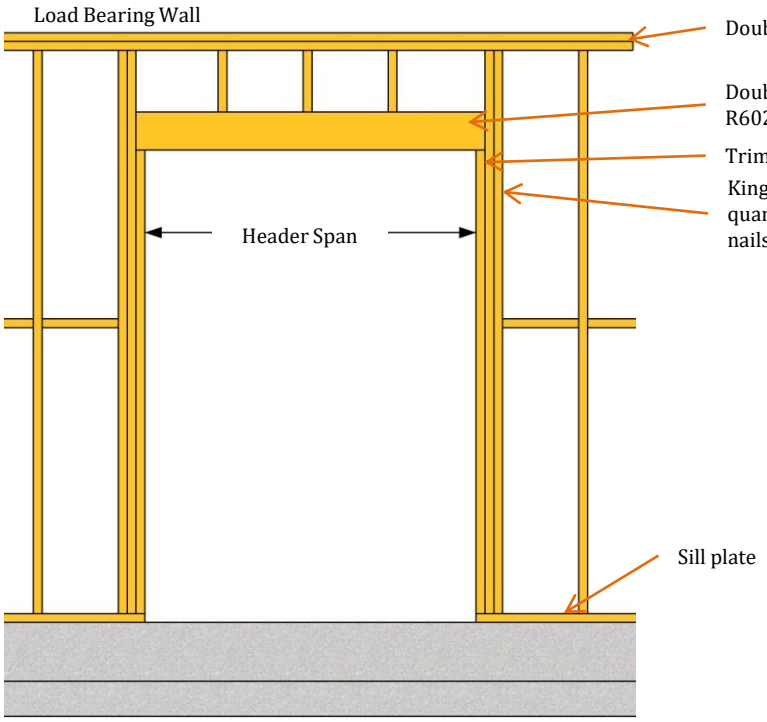


Notes:

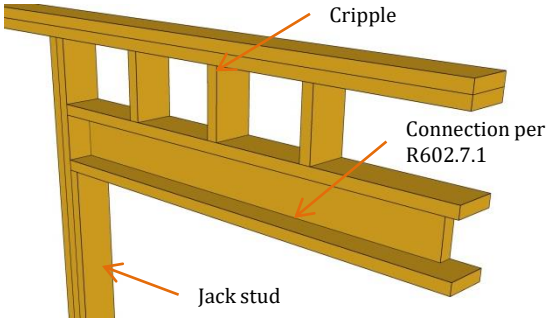
1. Any wood structural member in direct contact with earth or masonry/concrete shall be pressure preservative treated.
2. Minimum concrete compressive strength 2500 psi . R402.2
3. Thermal envelope requirements see 2009 IECC 402.1.1 & N1102
4. For exterior windows and doors see R609
5. For roof assemblies see R901
6. Provide 2x blocking for joist spans >8'-0" and interior walls not directly over framing.
7. For single family dwellings, duplexes, and their accessory buildings, maximum wall openings not to exceed 25% of wall area when within 5' of property line. Openings not allowed when less than 3' to property line. 1-hr wall required when within 5' of property line

Partial Building Section

Raised Floor Construction
NTS

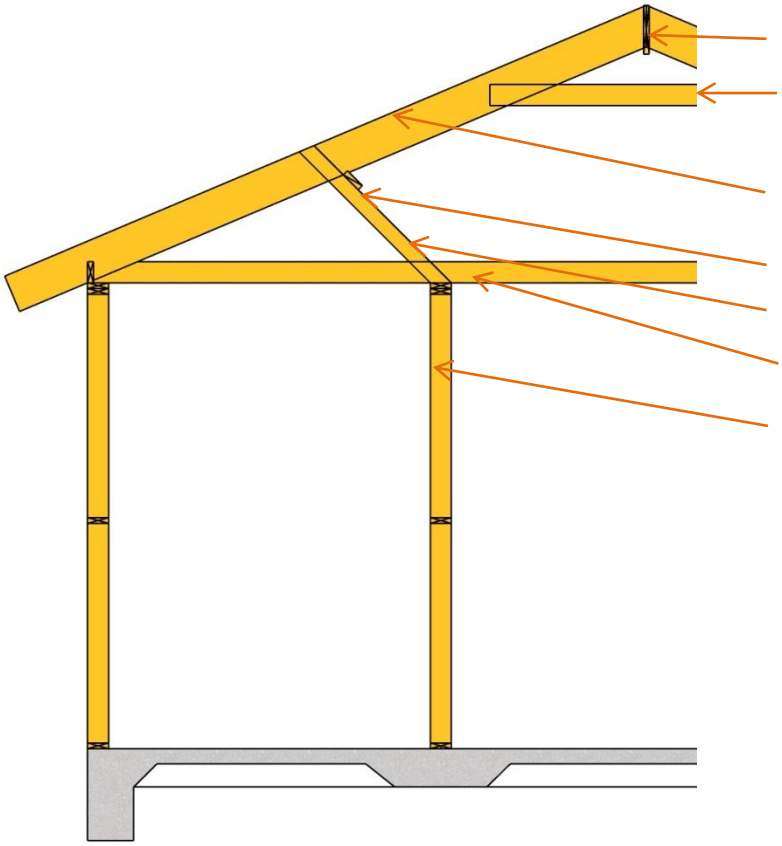


Typical Header Elevation
NTS

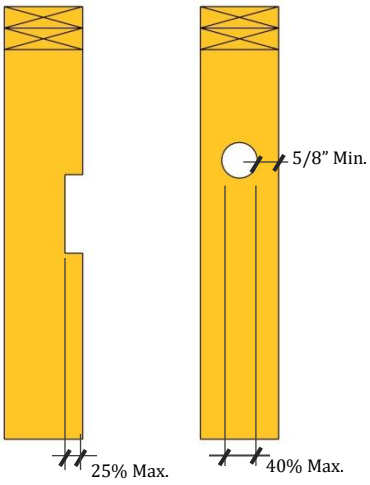


Single member headers shall be framed with a single flat 2" member or wall plate not less than the width of the wall studs on top and bottom of the header.

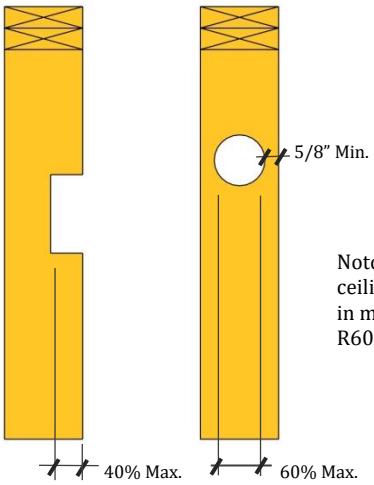
Single Member Header
NTS – See R602.7.1(1)



Framing Diagrams
NTS

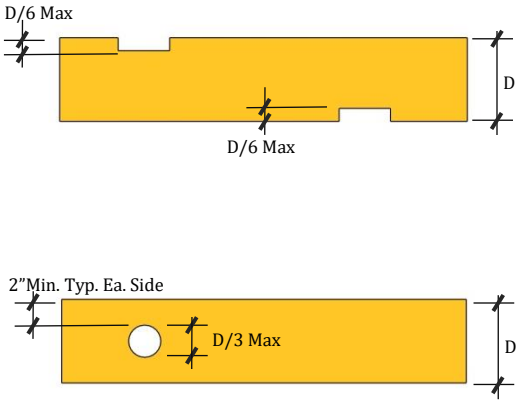


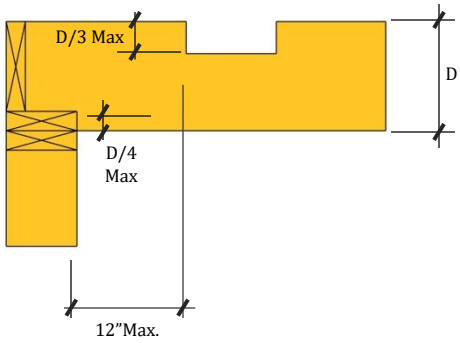
Bearing Partitions



Non-bearing Partitions

Notching and boring in rafters and ceiling joists (notching not permitted in middle 1/3 if rafter or joist span
R602.4, R602.5, R802.7, R502.8





Notching & Boring
NTS

Ceiling Joists

Allowable Spans For SYP#2
Dead Load 10, Live Load 20 psf
Mad. Roofing Load 6 psf (Asphalt Shingles)

Rafter Size	Spacing	Allowable Span
2x4	24” 16” 12”	**6’-9”** **8’-0”** **9’-3”**
2x6	24” 16” 12”	**9’-10”** **12’-0”** **13’-11”**
2x8	24” 16” 12”	**12’-6”** **15’-3”** **17’-7”**
2x10	24” 16” 12”	**N/A** **18’-1”** **20’-11”**

Floor Joists

Allowable Spans For SYP#2
Light Dead Load (up to 10psf), Live Load 40 psf
Max. Flooring Load 1.5 psf (carpet/vinyl)

Rafter Size	Spacing	Allowable Span
2x4	24” 16” 12”	**7’-7”** **9’-4”** **10’-3”**
2x6	24” 16” 12”	**9’-8”** **11’-10”** **13’-6”**
2x8	24” 16” 12”	**9’-8”** **11’-10”** **13’-6”**
2x10	24” 16” 12”	**11’-3”** **14’-0”** **16’-2”**
2x12	24” 16” 12”	**13’-6”** **16’-6”** **19’-1”**

Floor Girders

Allowable Spans For SYP#2
One Floor Only
20’-0” Building Width

Span	Jack Studs	Girder Size
3’-1”	1	**(2) 2x4**
7’-0”	2	**(2) 2x10**
10’-0”	3	**(4) 2x10** **(3) 2x12**

Roof Rafters

Allowable Spans For SYP#2
Light Dead Load 20, Live Load 20 psf
Mad. Roofing Load 6 psf (Asphalt Shingles)

Rafter Size	Spacing	Allowable Span
2x4	24” 16” 12”	**8’-4”** **7’-9”** **9’-0”**
2x6	24” 16” 12”	**9’-6”** **11’-8”** **13’-6”**
2x8	24” 16” 12”	**12’-1”** **14’-9”** **17’-3”**
2x10	24” 16” 12”	**14’-4”** **17’-6”** **20’-3”**
2x12	24” 16” 12”	**16’-10”** **20’-8”** **23’-10”**

Headers

Allowable Spans For SYP#2
Maximum Span for Tributary Load 20’-0”
Roof and Ceiling Only

Span	Beam Size
Up to 4’-0”	**(1) 2x8**
4’-1” to 6’-0”	**(2) 2x8**
6’-1” to 8’-0”	**(2) 2x10**
8’-1” to 10’-0”	**(3) 2x10**
10’-1” to 12’-0”	**(4) 2x12**

R602.7(1), R602.7(2), R602.7(3)

Allowable Spans For Plywood or OSB Floor and Roof Sheathing Continuous Over Two or More Spans Perpendicular to Supports

For Panels 24" or Wider

Sheathing Grades		Roof				Floor
Span Rating	Span Thickness	Maximum Span (Inches)		Loads (PSF)		Max. Span (Inches) Panel Edges with T&G Joints or with Blocking
Roof/Floor Span		Edge Support (2xBlocking)	No Edge Support (½" Max.Span+24")	Total Load	Live Load	
24/0	3/8"	24	20	40	30	
24/16	7/16"	24	24	50	40	16
32/16	15/32",1/2"	32	28	40	30	16
40/20	5/8",3/4",7/8"	40	32	40	30	20
48/24	23/32",3/4",7/8	48	36	45	35	24

Nailing Schedule

Table R602.3

JOIST TO SILL OR GIRDER, TOE NAIL	3-8d common
BRIDGING TO JOIST, TOENAIL EACH END	2-10d
SOLE PLATE TO JOIST OR BLOCKING, TYPICAL FACE NAIL	16d @ 16" oc
SOLE PLATE TO JOIST OR BLOCKING, AT BRACED WALL PANELS	3-16d per 16"
TOP PLATE TO STUD END NAIL	2-16d
STUD TO SOLE PLATE	4-8d, toenail or 2-16d end nail
DOUBLE STUDS FACE NAIL	16d @ 24" oc
DOUBLE TOP PLATES, TYPICAL FACE NAIL	16d @ 16" oc
DOUBLE TOP PLATES, LAP SPLICE	8-16d (12-16d for seismic braced wall)
BLOCKING BETWEEN JOISTS OR RAFTERS TO TOP PLATE, TOENAIL	3-8d
RIM JOIST TO TOP PLATE, TOENAIL	8d @ 6" oc
TOP PLATES, LAPS, AND INTERSECTIONS, FACE NAIL	2-16d
CEILING JOIST TO TOP PLATE, TOENAIL	3-8d
CONTINUOUS HEADER TO STUD, TOENAIL	4-8d
CEILING JOISTS, LAPS OVER PARTITIONS, FACE NAIL	3-16d
CEILING JOISTS TO PARALLEL RAFTERS, FACE NAIL	3-16d min. (R802)
RAFTER TO PLATE, FACE NAIL	R802
BUILT-UP CORNER STUDS	16d @ 16" oc

The International Energy Conservation Code sets requirements for the "effective use of energy" in all buildings. Certain buildings that use very low energy use (such as buildings with no heating or cooling) are exempt. The code applies to new buildings and to remodels, renovations, and additions to buildings.

2009 International Energy Conservation Code Table 402.1.1
R-values for Residential Construction

Climate Zone	Fenestration U-Factor [b]	Skylight U-Factor	Glazed Fenestration SHGC [b]	Ceiling R-Value	Wood Frame Wall R-Value	Floor R-Value	Basement Wall R-Value [c]	Slab R-Value & Depth [d]	Crawl Space Wall R-Value [c]
4 Except Marine	0.35	0.60	NR	38	13	19	10/13	10, 2 ft	10/13

b. The fenestration column excludes skylights

c. 10/13 means R-10 continuous insulation sheathing on the interior or exterior of home or R-13 cavity insulation at the interior of the basement wall

d. R-5 shall be added to the required slab edge R-values. Insulation depth shall be the depth of the footing or 2 feet whichever is less.

A Energy Efficiency Certificate with the appropriate values should be placed inside the electrical panel door of any permitted residential construction.

City of Paducah Energy Efficiency Certificate

Insulation Rating

	R-Value		R-Value
Ceiling		Basement	
Roof		Crawlspace	
Walls		Slab Edge	
Floors		Attic	
Ducts		Other	

Fenestration Rating

	NFRC U-Factor	NFRC SHGC
Window		
Opaque Door		
Skylight		

Equipment Performance

	Type		Efficiency
Heating System		AFUE	
Cooling System		SEER	
Water Heater		EF	

Indicate if the following have been installed

- ☐ Electric Furnace
- ☐ Gas-fire Unvented Heater
- ☐ Baseboard Heater

Designer/Builder

Code Edition Date