



# WISCONSIN DWELLING CODE COUNCIL

DEPARTMENT OF SAFETY AND  
PROFESSIONAL SERVICES

*One- and Two-Family Dwelling Code Review and Recommendations*

July 2014

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# INTRODUCTION

The Dwelling Code Council that is created under section 15.407 (10) of the Wisconsin Statutes advises the Department of Safety and Professional Services on construction standards for one- and two-family dwellings. These standards are contained in the *Wisconsin Uniform Dwelling Code*, which consists of chapters SPS 320 to 325 of the Wisconsin Administrative Code.

Appointed by the Governor for two-year staggered terms, each council member represents at least one of the following interest groups: building-trade labor organizations; certified building inspectors who are employed by local units of government; building contractors actively engaged in on-site construction of one- and two-family dwellings; manufacturers, retailers, or installers of manufactured or modular one- and two-family dwellings; architects, engineers, or designers who are registered under chapter 443 of the Statutes and who are actively engaged in the design or evaluation of one- and two-family dwellings; the construction-material supply industry; remodeling contractors actively engaged in the remodeling of one- and two-family dwellings; persons with disabilities, as defined in section 106.50 (1m) (g) of the Statutes; and fire-prevention professionals. An employee of the Department, as designated by the Secretary of the Department, serves as the secretary of the Dwelling Code Council but does not act as a member of the Council.

In 2013 and the first half of 2014, the Dwelling Code Council met 9 times and developed several recommendations for updating the *Wisconsin Uniform Dwelling Code*, based in part on comparisons to the 2009 and 2012 editions of the *International Residential Code*<sup>®</sup> (IRC<sup>®</sup>). This report, as required by section 101.62 of the Statutes, describes the Council's review of the *Code* during those meetings, and presents the Council's recommendations in the same sequence as the sections in chapters SPS 320 to 325. Included with many of the recommendations is an estimate of whether implementing the recommendation will result in cost savings (CS), time saving (TS), or easier use of the Code (EU) – along with reference to any other benefits, such as improvement of structural integrity, improvement of safety, or expansion of options.

## SPS 320: ADMINISTRATION AND ENFORCEMENT

### REVIEW

1. Small day-care, foster-home, and home-occupation operations.
2. Definitions for guardrail and handrail.
3. Definition of stairway.
4. Definition of stair and stairs.
5. Wall-bracing details on construction plans.
6. Standards adopted by reference.

## RECOMMENDATIONS

1. Expand section SPS 320.02 (1) to clarify that chapters SPS 320 to 325 apply to one- and two-family dwellings which accommodate small day-care, foster-home, and home-occupation operations – and which are excluded from the Wisconsin Commercial Building Code.
2. Define “guardrail” to mean a barrier erected to prevent a person from falling to a lower level. Define “handrail” to mean a horizontal or sloping rail intended for grasping by a hand, for guidance or support.
3. Revise the definition of “stairway” in SPS 320.07 (66) to refer to one or more risers rather than one or more steps.
4. Expand the definition of “stairway” in SPS 320.07 (66) to apply the same meaning to “stair” and “stairs,” which are used in place of “stairway” in several places in chapters SPS 320 to 325.
5. Replace the requirement in section SPS 320.09 (5) (b) 2. d. for showing braced wall lines on construction plans with instead requiring a Legend that details the wall-bracing method and the lengths or number of braced wall panels – and where more than one circumscribed rectangle is used, requiring definition of them (CS, TS, EU, and provides clarification).
6. Update each of the standards that are adopted in SPS 320.24 (2), to their current editions; and adopt any new standards that would be helpful (CS, TS, EU, and reflects current engineering practices).

## SPS 321: CONSTRUCTION STANDARDS

### REVIEW

1. Fastening of building components.
2. Alternate materials and standards.
3. Exits to enclosed courtyards.
4. Second exit from the first floor.
5. Exits from a second floor.
6. Windows used for exiting.
7. Exits where the second floor is the lowest floor level in a dwelling unit.
8. Exits from a basement or ground floor that is used for sleeping.
9. Sliding-door openings.
10. Stairway clear width at and below a handrail.
11. Winder steps.
12. Handrails versus guardrails.
13. Baluster spacing on a stairway.
14. Openings in non-rigid guardrail material.
15. Stairway handrail height.
16. Exterior landings.
17. Guardrails for window wells, egress wells, and retaining walls.
18. Guardrails for ramps.
19. Safety glazing.
20. Room areas with a ceiling height of less than 5 feet.
21. Ceiling heights in bathrooms and other rooms that are not included in the definition of habitable room.

22. Fire-rated construction of an exterior wall for a garage adjacent to another structure.
23. Interconnection of smoke alarms.
24. Wood siding or sheathing in contact with concrete or masonry and within 6 inches of final grade.
25. Drainage of exterior grade and impervious surfaces away from a dwelling.
26. Frost protection for a ramp or landing.
27. Lateral support for a foundation wall.
28. Bridging for a wood-framed floor.
29. Sill and bottom plates on foundation walls.
30. Decks serving an exit.
31. Flashing where a roof intersects with an upper-lying head wall and rake wall.
32. Flashing where a roof intersects with upper-lying masonry.
33. Flashing where a roof eave intersects with a sidewall.
34. Wood-stud heights of more than 10 feet.
35. Wall bracing.
36. Basement sidewalls that provide wall bracing.
37. Floor levels in attics, relating to wall bracing.

## RECOMMENDATIONS

1. Update the fasteners which are required by SPS 321.02 (1) (d) and which are listed in the SPS 320 to 325 Appendix, to match the fasteners which are required by Tables R602.3(1) and R802.5.1(9) in the 2012 edition of the IRC (provides consistency with current technology and products).
2. Expand 321.02 to clarify that materials or standards which are equivalent to those listed in subsection (3) can be used to carry the design loads in subsection (1), and merge the text from SPS 320.02 (5) relating to innovative dwellings with this expanded text.
3. Revise SPS 321.03 to clarify that exits may not discharge to enclosed courtyards.
4. Revise SPS 321.03 (1) (a) and (h) to allow using an egress window as a second exit from the first floor of any dwelling unit, provided each bedroom on the floor has one.
5. Revise SPS 321.03 (2) (a) to clarify that both exits from the second floor may discharge to the first floor, and that the second exit may discharge to a balcony or a deck.
6. Revise SPS 321.03 (2) (b) to clarify that egress windows may be used as second exits from the second floor regardless of whether the floor has any bedrooms.
7. Revise SPS 321.03 (2) (c) to clarify that where the second floor is the lowest floor in a dwelling unit, windows may be used as second exits, and that exits cannot go through other commercial or residential units on the first floor.
8. Revise SPS 321.03 (5) (b) to clarify that egress windows under decks or porches must discharge through a clear path of at least 36 inches in height and 36 inches in width, to a yard or open space.
9. Revise SPS 321.03 (7) (a) 4. to decrease the 30-inch-wide clear opening for a sliding exit door to 29 inches (CS, TS, EU).
10. Revise SPS 321.04 (2) (a) 1. to make it consistent with the last sentence of IRC section R311.7.1, which lists a minimum clear width of 31½ inches for a handrail on one side and 27 inches for a handrail on both sides (EU and provides clarification).
11. Revise SPS 321.04 (2) (c) 4. a. to no longer require a tread depth at any place on a winder step to match the tread depth of the rectangular steps in the stairway – and to instead require a

minimum depth of 9 inches at a distance of 12 inches from the narrow end of the tread or from the inside face of the wall, baluster or spindle at that end. Also consider whether the terminology for winder steps should more closely match the terminology in the IRC, such as the references there to the walk line on winder steps.

12. Clarify SPS 321.04 (3) (a) by separating the handrail requirements from the guardrail requirements (EU).
13. Update SPS 321.04 (3) (a) 3. by increasing the allowed opening between balusters on a stairway, from 4 inches to 4 3/8 inches, as allowed by exception 2 in IRC section R312.1.3 (CS and increases uniformity).
14. Expand SPS 321.04 (3) (a) 3. to require applying up to 4 pounds of force in determining whether a 4-inch-diameter sphere (4 3/8-inch, if recommendation 13 is adopted) will pass through an opening in any non-rigid material in a guardrail (provides clarification).
15. Revise SPS 321.04 (3) (b) 1. to include the handrail-height protrusions that are allowed by the two exceptions in IRC section R311.7.8.1 (CS, TS, EU, and provides clarification).
16. Revise SPS 321.04 (3) (c) to exempt window wells, egress wells, and retaining walls from the guardrail requirements.
17. Revise SPS 321.04 (4) (b) and (c) to differentiate exterior landings from interior landings, and to then require sloping an exterior landing to drain away from the stairs or a door, with a pitch of up to ¼ inch per foot (improves structural integrity and safety).
18. Revise SPS 321.045 (4) (c) to not require guardrails for ramps having a walking surface that is less than 24 inches above adjacent grade – if a toe-kick or side rail is provided to 4 inches above the walking surface, and a mid-rail is provided between there and the handrail (CS, TS, EU).
19. Revise SPS 321.05 (3) to recognize use of ANSI Z97.1 as a test standard for safety glazing that is required in locations which are not regulated by the US Consumer Product Safety Commission, review whether this glazing can be safely omitted in any of these locations, and consolidate the safety-glazing requirements from SPS 321.04 (3) (a) 4. c. into this section (CS, EU, and updates the rules to current national standards).
20. Revise SPS 321.06 to not count any area with a height of less than 5 feet when calculating whether at least 50% of a habitable room or corridor has a height of at least 7 feet. Also revise SPS 321.05 (1) and (2) to likewise not count this area when calculating the needed amount of natural light and ventilation for the room (CS, EU, provides clarification, and expands options).
21. Revise SPS 321.06 to allow any room to have a ceiling height of less than 7 feet if at least 50% of the room's floor area has a ceiling height of at least 7 feet; and allow reducing the ceiling height above a bathtub, shower stall, lavatory, or toilet – independent of the 50 percent limit – wherever the usual headroom is not needed, provided the fixtures are still useable for their intended purpose.
22. Revise Table 321.08 to require at least a 10-foot separation between any unprotected opening in the wall and the other structure (EU and provides clarification).
23. Update SPS 321.09 (2) (a) to allow the interconnection between smoke alarms to be wireless (CS, TS, EU, recognizes current technology, and expands options).
24. Revise SPS 321.10 (2) (f) to no longer require preservative treatment or natural decay resistance for wood siding or wood sheathing which is in contact with concrete or masonry and which is from 2 to 6 inches above final exterior grade (provides clarification, improves structural integrity, and expands longevity of buildings).
25. Expand SPS 321.12 to address (1) drainage of impervious surfaces, by applying equivalent-performance-type criteria; and (2) alternate drainage methods for both pervious and impervious

- surfaces, where a distance of 10 feet away from the dwelling is not available (provides clarification, expands options, and improves structural integrity).
26. Exempt exterior ramps from the requirement for differential-frost-movement isolation in SPS 321.15 (1) (e), apply the frost-protection requirements in SPS 321.16 (1) (a) to landings instead of to ramps, and exempt ramp posts from those frost-protection requirements. However, where a ramp abuts a frost-protected stoop or landing, that end of the ramp needs similar frost-protected support, such as bearing onto the stoop or landing, so that a tripping hazard is not created. (CS, TS, EU)
  27. Expand SPS 321.18 (1) (c) 3. a. to convey the strength that is provided by the specified anchor bolts, in order to aid use of alternates which provide equivalent strength (CS, EU, provides clarification, and expands options).
  28. Add a Note to SPS 321.22 (9) (a) explaining that the required bridging for a wood-framed floor applies to 2X10 or deeper joists (EU, provides clarification, and makes the requirement understandable).
  29. Expand SPS 321.22 and 321.25 to allow sill and bottom plates to partially extend beyond the load-bearing surface of a foundation wall in order to put the exterior surface of an upper-lying wall flush with or beyond the exterior surface of insulation that is placed on the outside of the foundation wall.
  30. Comprehensively update and clarify the requirements for decks, in SPS 321.225, preferably through an emergency rule that precedes a permanent rule (TS, EU, and improves structural integrity).
  31. For a roof that intersects with an upper-lying head wall and rake wall, such as where a dormer is provided, expand SPS 321.24 (3) to require the metal flashing along the rake wall to extend down the roof at least one-half inch past the vertical flashing on the head wall.
  32. For a roof that intersects with upper-lying masonry, consider whether further flashing requirements are needed in SPS 321.24 (3) or 321.26 (8) to prevent accumulation of moisture behind the masonry.
  33. For a roof eave that intersects with a sidewall, consider expanding SPS 321.24 (3) to require either [1] installing the end of the roof flashing so that it diverts water away from the sidewall and onto the roof or into the gutter, or [2] extending the sidewall finish material to at least 12 inches inside the intersection of the eave and the sidewall.
  34. Revise the footnotes under Table SPS 321.25–A to more clearly show that wood-stud heights of more than 10 feet must be designed by structural analysis.
  35. Comprehensively update, streamline, and clarify the wall-bracing requirements in SPS 321.25 (8) and (9), first through an emergency rule and then through a corresponding permanent rule (TS, EU).
  36. For a walk-out basement having a sidewall partially constructed with full-height studs and partially with full-height concrete, develop prescriptive parameters under SPS 321.25 (8) for including the concrete-wall portion as part of the required wall bracing (CS, TS, EU).
  37. Add a footnote to SPS 321.25 Table–J to exempt a floor (habitable or otherwise) that is contained wholly within the roof rafters or roof trusses, from being considered a floor for purposes of determining wall bracing, provided the top-of-wall-to-ridge height does not exceed 20 feet and the openings in the roof do not exceed 48 inches in height.

# SPS 322: ENERGY CONSERVATION

## REVIEW

1. Unheated spaces.
2. Nonessential uses of natural gas.
3. Posting R-values for insulation and U-factors for windows and doors.
4. Wind-wash protection at eaves.
5. Protection of foam insulation on the outside of foundation walls.
6. Insulation and air-sealing for an attic-access cover.
7. Insulation for skylight shafts.
8. Slab-edge insulation for unheated, attached garages.
9. Protection of vertical slab-edge insulation at garage doors for heated garages.
10. Vapor-retarder sealing at windows and doors.
11. Vapor retarders above open areas.
12. Vapor retarders over cavities with spray-applied foam.

## RECOMMENDATIONS

1. Revise SPS 322.01 (3) to no longer require a vapor retarder for an unheated space, such as an attached, unheated garage (CS, TS).
2. Delete the Note under SPS 322.01, that refers to the Public Service Commission's regulation of nonessential uses of natural gas, which was discontinued by 2011 Wisconsin Act 154 (reflects statutory changes).
3. Repeal the requirements in SPS 322.20 (6) relating to posting a certificate by the electrical distribution panel, for showing the predominant R-values of the home's insulation such as in the ceilings, roofs, and walls; and the U-factors for all windows, skylights, and doors (CS, TS, EU).
4. Revise SPS 322.21 (2) to clarify that wind-wash protection is required for the vertical ends of batt insulation at eaves if the insulation is air-permeable and more than 30 degrees from horizontal.
5. Revise section SPS 322.21 (3) (b) to require extending the protective coating to at least 2 inches below finished grade, rather than 6 inches – with an exception of not requiring the protection below a brick ledge.
6. Revise SPS 322.31 to require an R-value of at least R-20 for an attic-access cover having foam insulation, and at least R-38 for a cover having fiberglass insulation (CS, TS, EU).
7. Revise SPS 322.32 (9) to clarify that the vertical surface in a skylight shaft is considered a wall for insulating purposes.
8. Revise SPS 322.33 to clarify that the foundation insulation for unheated attached garages may stop even with the inside basement wall, perpendicular to the edge of the garage.
9. Revise SPS 322.33 to require heated-garage exterior thermal breaks to be rated at least R-5, to address details at garage doors, and to remove the requirement for R-15 insulation for heated concrete slabs.
10. Revise SPS 322.38 (1) (b) to clarify that sealing a vapor retarder is not required around doors and windows, behind bathtub enclosures, and at top and bottom wall plates, except seams which are not over a framing member must be sealed or taped.

11. Revise SPS 322.38 (2) to clarify that a vapor retarder for a floor over an open area can consist of 5/8-inch tongue-and-groove oriented-strand board (OSB) or 3/4-inch tongue-and-groove CDX plywood.
12. Expand SPS 322.38 (2) (c) 4. to not require a vapor retarder over cavities that have at least 50% of the required R-value provided by spray-applied foam having a perm rating of 1.0 or less, unless required by the foam manufacturer.

## SPS 323: HEATING, VENTILATING AND AIR CONDITIONING

### REVIEW

1. Solid-fuel-fired water-heating appliances for space heating.
2. Clothes-dryer vent locations on plans.
3. Clearances above cooktops and ranges.
4. Supports for floor- and ground-based mechanical equipment.
5. Ceiling-mounted burners and ignition devices where compressed-natural-gas (CNG) vehicles are stored.
6. Combustion air for fireplaces and fireplace stoves.
7. Labeling of piping used in mechanical systems.
8. Exhaust venting for clothes dryers.
9. Vapor retarders and insulation for ducts in attics.

### RECOMMENDATIONS

1. Under SPS 323.04 (4) and 341.49 (3), pursue allowing indoor installation of non-pressurized solid-fuel-fired water-heating appliances for space heating.
2. Expand SPS 320.09 (5) to require showing the location of venting for clothes dryers.
3. Revise Table 323.04–A to allow a vertical clearance of less than 30 inches above a cooktop or range if specified by the manufacturer of the cooktop or range hood.
4. Replace the floor- and ground-support requirements in SPS 323.04 and 323.045, such as for clearances, with a need to comply with the manufacturer's instructions, as is required by the IRC.
5. Consider expanding SPS 323.04 (6) (b) to set a minimum distance below a ceiling for a burner or ignition device in garages storing compressed-natural-gas (CNG) vehicles.
6. Clarify SPS 323.06 to show that methods of providing combustion air are not required for fireplaces and fireplace stoves.
7. Expand SPS 323.10 to require plastic pipes and fittings used in venting flue gas to bear the manufacturer's identification data.
8. Revise SPS 323.14 (2) to require all clothes-dryer venting, including for electric dryers, to be rigid and smooth-walled.
9. Expand SPS 323 and 322 to address insulation and a vapor-retarder covering for it on cooling ducts in attics.

## SPS 325: PLUMBING

## REVIEW

1. Tankless water heaters.
2. Non-trapped local waste piping.
3. Garage drains.

## RECOMMENDATIONS

1. Expand chapter SPS 325 to include the water-heater sizing criteria contained in the Department's Alternate Approval #20090426, until chapters SPS 381 to 387 are revised to include the criteria (CS, TS, EU).
2. Expand chapter SPS 325 to include a modification of SPS 382.33 (5) (b) that would allow omitting traps in local waste piping in lengths up to 20 feet, rather than up to 30 inches.
3. Expand chapter SPS 325 to include a modification of SPS 382.34 (4) (b) that would [1] allow omitting traps for garage drains that discharge to the ground surface, [2] require the drain's sediment basket to be removable, and [3] allow the drain's cover to be nonmetallic material that can be driven over.