CodeCheck.com

Code☑Check® 10th Edition

for Acrobat Reader

State Codes

Based on the 2021 IRC®, 2021 UMC® & UPC®, and the 2020 NEC®

By DOUGLAS HANSEN, SKIP WALKER, REDWOOD KARDON & GLENN MATHEWSON

Illustrations by Paddy Morrissey, Kaia Mathewson & Douglas Hansen

 ISBN 979-8-9873271-9-7 $29.99

Code Check 10th edition is a shorthand guide to model code requirements and common violations in the construction of 1- & 2-family dwellings & townhouses. The primary reference is the 2021 editio[illegible] ***International Residential Code for One- and Two-Family Dwellings (IRC)*** [illegible] the International Code Council®.

Model codes are revised with new e[illegible] changes from previous editions of the codes are highlighted in the text[illegible] uded. State or local governments adopt model codes at different time[illegible] ode in the upper right corner and contact the local building departme[illegible] erial. The figure and table numbers in the eBook do not match the print e[illegible]

THE BUTTONS AT THE TOP OF EACH PAGE ARE LINKS THAT TAKE YOU TO THE DESCRIBED DESTINATIONS (LINKS NOT ACTIVE IN THESE SAMPLE SCREEN SHOTS)

Conventions used in this b[illegible] [illegible] narize a particular code rule. Figures and tables accompany the text, and changes from the previous code editions are highlighted and explained. To condense such a large amount of information into a relatively small book, we have used many abbreviations, which are always accessible through the button at the top of every page.

How to navigate this book: You must be using Adobe Acrobat® or Acrobat Reader to use the navigation features of this book. Reader is a free download.

The easiest way to find a particular topic is to start at the table of contents.

- Every line in the table of contents is a link to the section it describes.
- Figures and tables are referenced in the text by the letters **F** and **T** followed by the figure or table number.
- When the text references a figure or table that is not on the same page as the text, clicking on the reference number takes you to that reference, and clicking on the red "Return to Previous View" button at the top of the screen takes you back to the text.
- The security settings for Adobe Reader will allow you to make and save your own highlighting and notes in the file.

For updates and information related to this book, visit codecheck.com

CONTENTS – BUILDING

EACH LINE IN THE TABLE OF CONTENTS IS A LINK. FOR EXAMPLE, FROM WHEREVER YOU ARE IN THE BOOK, IF YOU DECIDE TO LOOK AT "PLUMBING FITTINGS," SIMPLY CLICK ON "CONTENTS" AT THE TOP OF EACH PAGE, THEN CLICK THE LINE FOR "FITTINGS" IN THE SECTION ON "DRAINAGE". IT WILL TAKE YOU TO THAT PAGE. TO RETURN TO WHERE YOU HAD BEEN, CLICK THE RED "RETURN TO PREVIOUS PAGE" BUTTON.

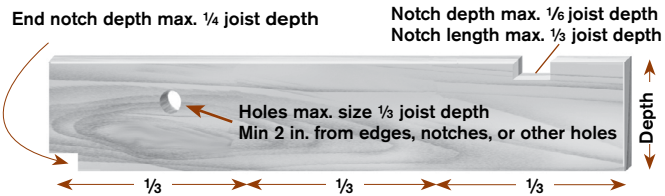
PLUMBING

ABBREVIATIONS USED IN THIS BOOK

Ø = not allowed
1&2FD = 1- & 2-Family Dwellings
A = amp(s) (example: a 15A breaker)
AAV = air admittance valve
ABS = black plastic DWV pipe
AC = armored (electrical) c
AC = air conditioning
ACCA = AC Contractors o
ACH = air changes per hou
AFCI = arc-fault circuit inte
AFF = above finished floor
AHJ = Authority Having Jur
AL = aluminum
AMI = in accordance with
AMM = Alternative Materials, Design, & Methods
ANSI = American National Standards Institute
ASTM = ASTM International (formerly American Society for Testing & Materials)
AWG = American Wire Gauge, commonly verbalized as "number" (#8 = 8 AWG)
B (vent) = gas vent, usually double-wall
BO = building official
BTE = building thermal envelope
Btu = British thermal unit
BWL = braced wall line
BWP = braced wall panel
C = centigrade
C/A = combustion air
C/O = cleanout (plumbing)
cu. = cubic (example: 24 cu. ft.)
Cu = copper
CW = clothes washer
CZ = climate zone
DFU = drainage fixture unit(s)
DW = dishwasher
DWV = drain, waste & vent
e.g. = *exemplia gratia* – "for example"
EGC = equipment grounding conductor
EMT = electrical metallic tubing
EV = electric vehicle
ex: = example
EXC = exception (follows in next line)
exc = except
F = Farenheit
FD = Family Dwelling, as in *1-Family Dwelling*
Fe = ferrous (iron or steel)
FLR = flood level rim
FMC = flexible metal conduit
FSD = fire separation distance
ft. = foot, feet
FVIR = flammable-vapor ignition-resistant
ga. = gauge
gal = gallon(s)
galv = galvanized
GB = gypsum board
GEC = grounding electrode conductor
GFCI = ground-fault circuit interrupter
GPF = gallons per flush
gpm = gallons per minute
HDG = hot dipped galvanized
hp = horsepower
hr. = hour(s)

Abbreviations are always accessible from the button at the top of every page. If an abbreviation is not familiar, you can look it up from here and then return to your place in the text with the red "RETURN TO PREVIOUS VIEW" button.

FIG. 15 Notching & Boring Joists & Girders



No notching in middle ⅓ (holes OK)
No notching at bottom if >4× lumber, except at

TABLE 8 NOTCHING & BORING JOIST

Nominal[A] Dimension Joist or Girder	Max Diameter Bored Hole	Max Notch Length	D
6	1½ in.[B]	1 13/16 in.	
8	2⅜ in.	2⅜ in.	
10	3 1/16 in.	3 1/16 in.	
12	3¾ in.	3¾ in.	

A. Table numbers based on actual dimensions: Typically 5½, 7¼, 9¼ and 11¼.
B. Though ⅓ depth would be 1 13/16 in., a hole that size would be <2 in. from the edge in 5½ in. material.

Engineered Wood Products & Floor Trusses — 21 IRC

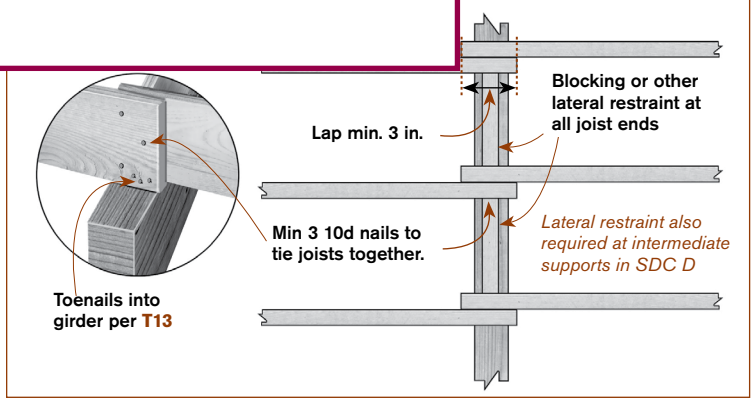
- ☐ Cuts, notches & holes only AMI by MFR or where specified & considered in design by a registered design professional _____ 502.8.2
- ☐ Metal-plate connected wood trusses per ANSI/TPI 1 & require design drawings by a registered design professional _____ 502.11.1
- ☐ Truss drawings to include bracing requirements _____ 502.11.2
- ☐ No truss alterations or repairs w/o approval of registered design professional _____ 502.11.3
- ☐ Truss design drawings must be submitted & approved by BO prior to installation & design drawings to be provided w/ shipment to job site 502.11.4
- ☐ Design drawings to include same types of information as required for roof trusses _____ 502.11.4

Framing at Openings in Floors — 21 IRC

- ☐ Openings to be framed using headers & trimmers _____ 502.10
- ☐ Single header joist same size as floor joists, max 4 ft. span _____ 502.10
- ☐ Single trimmers carrying single headers max 3 ft. to trimmer bearing _____ 502.10
- ☐ Double trimmers for openings >3 ft. from trimmer bearing points _____ 502.10
- ☐ Double headers & trimmers when header span >4 ft. _____ 502.10
- ☐ Headers & trimmers require bearing support or approved joist hangers 502.6
- ☐ Combustible framing min 2 in. from masonry chimneys _____ 1003.18

Joist Blocking & Bridging

attachment to rim joists
g stud **F16** _____ 502.7
F16 _____ 502.7
ts in SDC D _____ 502.7X2
_____ 502.7X1
1 in. × 3 in. strip
_____ 502.7.1



The eBook contains 105 illustrations and 40 tables. The text lines contain links to these illustrations and tables. When the link takes you to a different page, you can quickly return with the "RETURN TO PREVIOUS VIEW" button at the top.

BRANCH CIRCUITS

Sizes & Number of Branch Circuits	21 IRC	20 NEC
☐ Min number of branch circuits determined by calculated load **T40** & size or rating of circuits	3703.6	210.11A
☐ Branch circuit rating must be ≥ load it serves	3701.2	220.18
☐ Min size for branch circuit wiring #14 Cu	T3702.14	210.19A4
☐ Branch circuit ratings for other than individual circuits must be 15A, 20A, 30A, 40A, or 50A	3702.2	210.18

Required Branch Circuits		
☐ Min 2-20A small appliance (S.A.) circuits for receptacles in kitchen, breakfast room, dining room & pantry EXC	3703.2	210.11C1
• Appliances (refrigerator) on ≥15A individual circuits	3703.2X	210.52B1X2
☐ Min 1-20A circuit dedicated for laundry receptacles	3703.3	210.11C2
☐ Min 1-20A circuit dedicated for bath receptacles EXC	3703.4[61]	210.11C3[61]
• Other outlets OK if circuit serving only 1 bathroom	3703.4X	210.11C3X
☐ Min 1-20A circuit dedicated for garage receptacles (receptacles required for each vehicle bay)	3703.5[62]	210.11C4[62]
☐ Interior living space: typical 1 circuit per 500 sq. ft.	3703.6	210.11A

Restrictions on Required Circuits ("Outlet" = light or receptacle)		
☐ No other outlets on small appliance circuits EXC	3901.3.1	210.52B2
• Receptacles for range ignition or dedicated clock	3901.3.1X	210.52B2X
☐ No other outlets on bath receptacle circuits EXC	3703.4	210.11C3
• Separate 20A circuit may serve all outlets in 1 bath	3703.4X	210.11C3X
☐ Only laundry receptacles on laundry circuit (no lights)	3703.3	210.11C2
☐ No receptacles >5½ ft. AFF or other outlets on garage circuits for required outlets in each vehicle bay	3703.5[62]	210.11C4[62]

Individual Circuits		
☐ Individual circuit = supplying only one piece of equipment	3501	100
☐ Required for central heating & no other outlets EXC	3703.1	422.12
• Auxiliary equipment (electrostatic filter, pumps, humidifiers, related AC equipment)	3703.1	422.12X
☐ Required for EV branch circuit(s)	3702.13	625.40
☐ Required for cord/plug-connected range hood	4101.3	422.16B4

Branch Circuit Load Limitations	21 IRC	20 NEC
☐ Lighting & receptacles OK on same 15A or 20A circuit except those for small appliances, bath sink area receptacles, garage vehicle bay receptacles, & laundry equipment	3702.3	210.23A
☐ Multioutlet branch circuits for lighting or receptacles limited to max 20A branch circuit rating in dwellings	3702.5	210.23A–C
☐ Equipment fastened in place max 50% of 15A or 20A circuit when circuit also has lighting or equipment not fastened in place	3702.3	210.23A2
☐ Single piece of cord-&-plug-connected equipment not permanently faste…	…4	210.23B

TAB…	LOAD …
Circu…	…oad (Amps)
	12
	16
	24

RE…

Receptacles – General	21 IRC	20 NEC
☐ Grounding-type required on 15A & 20A circuits EXC	4002.2	406.4A
• Replacement non-grounding receptacles (***see p.69***)	n/a	406.12X4
☐ Receptacles for specific appliances (e.g., laundry, garage door opener) must be within 6 ft. of appliance location	3901.5	210.50C
☐ Must be mounted w/ 6–32 machine screws or AMI	4002.6	406.5
☐ Receptacles in recessed boxes to seat securely on finished surface; in flush-mounted boxes to seat securely on box	4002.6	406.5A&B
☐ Receptacles for direct AL connection marked "CO/ALR"	4002.3	406.3C
☐ Face-up in countertop or work surface L&L for same	4002.16	406.5G1
☐ Metal faceplates must be grounded	4002.4	406.6B

Tamper Resistant (TR) Receptacles – Required Locations		
☐ All dwelling unit receptacles specified in 210.52 EXC	4002.14	406.12
• If located >5½ ft. above floor, or part of a luminaire or appliance, or for appliance that is not readily moved	4002.14X	406.12X

Code changes are highlighted in the text. Each change is further explained in the summary at the end of the book. Each code citation that is a change is also a hyperlink to the summary.

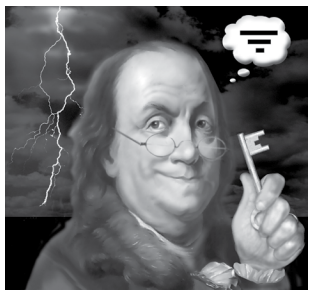
HIGHLIGHTED CODE CHANGES IN THE 2021 IRC, UPC & UMC AND THE 2020 NEC

MECHANICAL & FUEL GAS

48. **(p.49)** Previous editions required sediment trap upstream of flex connector.
49. **(p.49)** Added clarity regarding arc-resistant jacketed & coated systems.
50. **(p.53)** Wye or tee fittings can no longer be fabricated in the field.
51. **(p.53)** The IRC removed the exemption for lining of existing chimneys that have passed inspection; all chimneys venting gas appliances must be lined. The UMC still allows the exemption if chimney passes inspection.
52. **(p.55)** Rule for securing within 6 ft. new to this IRC edition.
53. **(p.55)** UMC consistency w/ energy codes and ASHRAE 62.2.

ELECTRICAL

54. **(p.57)** No exception to barrier rule for 2-6 disconnects.
55. **(p.57)** Each service enclosure requires a single main disconnect.
56. **(p.57)** An exterior emergency disconnect required for first responders.
57. **(p.57)** New or replacement services now require a surge-protective device.
58. **(p.59)** Ufer cannot be used to interconnect other GECs.
59. **(p.60)** Explicit rule that panelboards may not be in face-up position.
60. **(p.61)** Means other than calibrated torque test may be approved locally.
61. **(p.63,65,66)** In addition to the required 20A circuit receptacles for the sink area, other receptacles are allowed and do not need to be on 20A circuits.
62. **(p.63,66)** Other garage outlets, such as lights or for vehicle door openers, not allowed on the required 20A circuit for receptacles in each vehicle bay.
63. **(p.65)** Previously only applied to attached decks or balconies.
64. **(p.65)** New zone forbidding receptacles unless the room is <3 ft. wide, in which case the outlet goes on the opposite wall of the tub/shower.
65. **(p.66)** All countertop receptacles OK on face of a cabinet in this edition.
66. **(p.66)** Face-up receptacles not allowed under sinks.
67. **(p.66)** Prescribed method for equivalence of multi-outlet assemblies.
68. **(p.66)** Required locations increased in this edition. The next edition will not require any on islands, other than infrastructure for future outlets.
69. **(p.67)** The 6-ft. measurement now includes a cord passing through a door, such as the cabinet door in front of a food-waste grinder.
70. **(p.67)** Now applies to receptacles rated 250V, such as clothes dryers, if located in an area where receptacles require GFCI protection.
71. **(p.67)** Applies to all basement receptacles, not just unfinished basements.
72. **(p.67)** Added a general rule for indoor wet locations.
73. **(p.67)** Added required equipment service receptacles.
74. **(p.67)** Sump pumps require GFCI regardless of connection method.
75. **(p.67)** EV receptacles require GFCI protection.
76. **(p.67)** Clarified measurement method - often applies to service upgrades.
77. **(p.68)** GFCI protection now required. If adopted locally, a temporary amendment delays implementation of this rule to September 2026.
78. **(p.68)** Boxes in areas w/ potential use as paddle fan require listed fan boxes. Previous requirement was to include a control conductor.
79. **(p.68)** DW cords passing through cabinet require a protective grommet.
80. **(p.69)** All switches must now be listed.
81. **(p.70)** When a conductor forms a loop or is otherwise not straight between the box and the nearest support, the max conductor length is 18 in.
82. **(p.70)** Clarification that a pull-down ladder is not a stair for this rule.
83. **(p.72)** The first 4 EGCs count as one volume allowance based on the largest EGC; a ¼-volume allowance is required for each additional EGC.
84. **(p.73)** Replacement pool pump motors require GFCI protection.
85. **(p.74)** Appliances <¼ hp are part of general lighting load & are not counted as separate appliances for load calculation purposes.



Benjamin Franklin was chosen as the model character in our illustrations for several reasons. His insatiable curiosity, scientific genius, and civic-mindedness drove him to promote fire safety, public sanitation, heating methods that improved efficiency and reduced pollution, safe exits, and, of course, electricity. Franklin contributed to each of the four main disciplines of building inspection: Building, Plumbing, Mechanical, and Electrical.