FOUNDATION ANCHORAGE

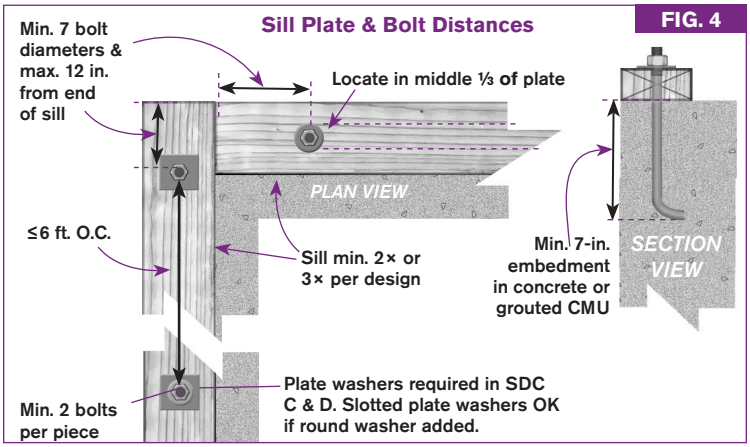
Plates & Sills — 21 IRC

- ☐ Sill PT or decay resistant if <8 in. above exposed ground — 317.1#2
- ☐ PT wood fasteners (including nails, nuts & washers) hot-dipped galv min G185 HDG coating, SS, silicone bronze, or Cu EXC — 317.3.1
  - • Bolts ≥½ in. diameter — 317.3.1X1
  - • Plain carbon steel OK in Zinc-Borate treated wood in dry interior — 317.3.1X3

Anchor Bolts F4

- ☐ Required for all sills & for exterior wall sole plates of monolithic slabs — 403.1.6
- ☐ Required for interior BWPs on monolithic slabs — 403.1.6
- ☐ Embed bolts min 7 in. in concrete or grouted cell of CMUs — 403.1.6
- ☐ Max spacing 6 ft. O.C. & min 2 bolts per plate EXC — 403.1.6
  - • Walls ≤24 in. connecting offset BWs 1 bolt in center ⅓ — 403.1.6X1
  - • Walls ≤12 in. connecting offset BWs no bolts required — 403.1.6X1
- ☐ Max 12 in. & min 7 bolt diameter from end of sill, middle ⅓ of width — 403.1.6
- ☐ SDC D & Light-frame Townhouses in SDC C: — 403.1.6.1
  - • Bolts at all interior BWP plates & interior bearing wall sole plates — 403.1.6.1
  - • Min 0.229 in. × 3-in. × 3-in. plate washers all BWLs — 403.1.6.1 & 602.11.1
  - • Max spacing 4 ft. O.C. for over 2 stories — 403.1.6.1

Sill Plate & Bolt Distances — FIG. 4



BASEMENT & FOUNDATION WALLS

General — 21 IRC

- ☐ CMU walls min ⅜-in. parge prior to dampproofing EXC — 406.1
  - • Dampproofing materials approved for direct application F3 — 406.1X
- ☐ No unbalanced backfill >4 ft. until walls anchored to floor — 404.1.7
- ☐ Walls subject to hydrostatic pressure or supporting >4 ft. of backfill w/o lateral restraint at top or bottom require engineered design — 404.1.1
- ☐ CMU rebar min distance from soil T1, F3 — 404.1.2.1

TABLE 1 — CMU REBAR DISTANCE FROM SOIL ◆ T404.1.1(2,3,4)

Thickness of masonry foundation wall	8 in.	10 in.	12 in.
Min distance face of soil to center of rebar	5 in.	6¾ in.	8¾ in.

CONCRETE & REINFORCEMENT

General — 21 IRC

- ☐ Min 2,500 psi in SDC A, B, or C; 3,000 psi in SDC D — 404.1.3.3.1
- ☐ Max slump 6 in. for concrete in removable forms — 404.1.3.3.4
- ☐ Work into corners & around embedded items — 404.1.3.3.5

Rebar—General

- ☐ Clearance to forms & soil T2 — 404.1.3.3.7.4
- ☐ Splice laps (grade 60) min 30 in. #4; 38 in. #5; 45 in. #6 — 404.1.3.3.7.5
- ☐ Max gap between parallel lapped bars 6 in. & ⅕ splice length — 404.1.3.3.7.5

Rebar in SDC D

- ☐ Footings min 1 #4 horizontal bar 3–4 in. from bottom — 403.1.3.1&2
- ☐ Min 1 #4 horizontal bar within 12 in. of top of stem wall — 403.1.3.1&2
- ☐ Vertical bars 4 ft. O.C. if construction joint between footing & stem wall or between footing & grouted CMU wall — 403.1.3.1&2
- ☐ Slab w/ turned-down footing reinforcement per F5 — 403.1.3.3

TABLE 2 — REINFORCING STEEL COVER ◆ 404.1.3.3.7.4

Foundation Surface	Min. Cover ≤ #5 bars	Min. Cover ≥ #6 bars
Cast against & permanently exposed to earth	3 in.	3 in.
Cast in removable forms & exposed to earth	1½ in.	2 in.
Not exposed to weather (top of indoor slab)	¾ in.	¾ in.
Stay-in-place forms (ICF)	¾ in.	¾ in.

DRAINAGE

General

	21 IRC	21 UPC
☐ No roof/site drains to building drains unless OK by AHJ	3001.1	714.2
☐ Size traps, arms & drains according to DFU load T11,12	3005.4	703.1
☐ Thrust blocks for 4-in. drain >45° horizontal change	2605.1#4	n/a
☐ Allow for thermal expansion & contraction of ABS/PVC	2605.1	312.2
☐ ABS to PVC only at building drain to building sewer	3003.13.4	705.9.4
☐ No drilled or tapped connections (e.g., saddle fitting)	3003.2	310.2

TABLE 11 DFUS, TRAPS & TRAP ARM MAX LENGTHS IRC T3004.1, 3105.1 & 3201.7 UPC T702.1 & 1002.2

Fixture	Min. Trap Size	DFUs	IRC Trap Arm	UPC Trap Arm
Kitchen sink[A,B]	1½ in.	2	6 ft.	3 ft. 6 in.
Laundry tub[B]	1½ in.	2	6 ft.	3 ft. 6 in.
Clothes washer	2 in.	2 (UPC 3)	8 ft.	5 ft.
Floor drain	2 in.	0 (UPC 2)	8 ft.	5 ft.
Lavatory[C]	1¼ in.	1	5 ft.	2 ft. 6 in
Bathtub	1½ in.	2	6 ft.	3 ft. 6 in.
Shower[D][26]	2 in.	2	8 ft.	5 ft.
Water Closet	3 in.	3	no limit	6 ft.
Bidet	1¼ in.	1	5 ft.	2 ft. 6 in.

A. With or without dishwasher or disposer.
B. UPC drain size after the trap arm is 2 in. – see T702.1.
C. UPC drain size after the trap arm is 1½ in. for sets of 2 or 3 lavatories – see T703.2.
D. IRC shower traps can be 1½ in. if aggregate flow rate is less than 5.7 gpm, UPC 1½ in. can be on tub to shower retrofit.[26]

TABLE 12 BRANCH DRAIN & VENT SIZE ◆ IRC T3005.4.1 UPC T703.2

Pipe size		1¼ in.	1½ in.	2 in.	2½ in.	3 in.	4 in.
IRC DFUs	Vertical	1	4	10	20	48	240
	Horizontal	1	3	6	12	20	160
	Wet Vents	Ø	1	4	6	12	32
UPC DFUs	Vertical	1	2	16	n/a	48[A]	256
	Horizontal	1	1	8	n/a	35[A]	216[B]
UPC Dry Vents[C]	Max DFUs	1	8	24	n/a	84	256
	Max Feet[D]	45	60	120	n/a	212	300

A. UPC: Horizontal drain pipe min. 4 in. if receiving >5 WCs.[27]
B. Based on ¼ in./ft. slope. For ⅛ in./ft. slope, multiply by 0.8.
C. IRC vents min 1¼ in. & min half the required drain diameter. IRC vents > 40 ft. increase 1 pipe size.
D. UPC vents increase 1 pipe size if horizontal length >⅓ the overall length.

Cleanouts

	21 IRC	21 UPC
☐ Removable trap or WC OK except for building sewer 3005.2.10.1[28]		Ø
☐ Required at junction of building drain/building sewer or upstream if near junction (IRC: within 10 ft.)	3005.2.3	719.1
☐ Not required pipes ≤45° from vertical (UPC: 72°)	3005.2.1	707.4X2
☐ Not required above lowest floor level of the building	n/a	707.4X3
☐ C/O plugs brass or plastic, square head or countersunk	3005.2.6	707.1
☐ ≥18-in. horizontal clearance (UPC: 24-in. if pipe >2 in.)	3005.2.9	707.9
☐ Terminate C/Os above grade or under cover plate	3005.2.10	707.8
☐ Underfloor C/Os min 24-in. (UPC 18-in.) vertical access	3005.2.10	707.9
• Underfloor C/Os max 5 ft. from access opening	n/a	707.9

Slope, Fittings & Changes of Direction

	21 IRC	21 UPC
☐ Min slope ¼ in./ft., ⅛ in./ft. for ≥4 in. if OK by AHJ	n/a	708.1
☐ Min slope ¼ in./ft., ⅛ in./ft. for ≥3 in.	3005.3 & T3105.1	n/a
☐ Use appropriate fittings for changes in direction T13	3005.1	706.1
☐ No reductions in direction of flow EXC	3002.3.1	315.2
• 4×3-in. WC bend	3005.1.6	310.5
☐ Joints between different materials AMI	3003.13	705.1&2
☐ Cast-iron couplings require metallic shield & center stop	3003.4.3	705.2.2

TABLE 13 APPLICATION OF FITTINGS ◆ IRC T3005.1 & UPC 706

Fitting		Horizontal to Vertical	Vertical to Horizontal	Horizontal to Horizontal
1/16 bend 22.5°		OK	OK	OK
⅛ bend 45°		OK	OK	OK
⅙ bend 60°		OK	OK	IRC: OK UPC: Ø
¼ bend 90°		OK	IRC: A,B UPC: ØC	IRC: A UPC: ØC
Long sweep		OK	OK	OK
Combo		OK	OK	OK
Wye		OK	OK	OK
Sanitary tee		OKD,E	Ø	Ø

A. Only allowed for 2-in. or smaller fixture drains.
B. In cast iron only, a "short sweep" is allowed for Note A conditions and vertical-to-horizontal if ≥3 in.
C. In cast iron only, the UPC allows "short sweep" fittings (radius > ¼ bend and < long sweep).
D. Double sanitary tees not to receive discharge from WCs unless min 18 in. between WC and fitting.
E. Double sanitary tees in UPC must have barrel 2 pipe sizes larger than inlets.

Backwater Valves & Ejector Pumps

	21 IRC	21 UPC
☐ Backwater valve for fixtures w/ FLR below next upstream manhole cover (UPC: on floor level below cover)	3008.1	710.1
☐ Fixtures above manhole not through backwater EXC	3008.1	710.1
• OK if backwater valve is normally open type	3008.2	n/a
☐ Backwater valve must remain accessible for service	3008.4	710.6
☐ Warning label for cleanouts leading to backwater valve	n/a	710.1
☐ Ejector required for fixtures below sewer crown level	3007.1	710.2
☐ Backwater or swing-check valve on ejector discharge pipe	3007.2	710.4
☐ Gate or ball valve on discharge side of check valve	3007.2	710.4
☐ Sump discharge must be lifted above gravity drain	3007.1	710.2
☐ Min 2-in. discharge piping	3007.6	710.3#2
☐ Connect to wye fitting at top of horizontal drain	3007.3.5	710.4

VENTING

General

	21 IRC	21 UMC
☐ System must convey combustion gases to outdoors	2427.3	802.3
☐ Vents L&L except single-wall or plastic per MFR	2426.1	802.1
☐ Select vent system type per appliance category & MFR T19	2427.4	802.4
☐ Install all venting systems AMI	2426.5	802.6
☐ Category I fan-assisted per MFR-supplied tables	2427.6.9.1(1)	802.6.2.1
☐ Vent no smaller than draft hood & not >7× larger	2427.6.9.1(2)	802.6.2.1
☐ Draft-hood appliance 1 60° offset OK, others ≤45° EXC	2427.6.9.2	802.6.3.2
• Fan-assisted: use MFR-supplied vent tables	2427.6.9.1(1)	802.6.2.1
☐ Insulation shield min 2 in. above attic insulation & AMI	2426.4	802.6.1.1
☐ Concealed vents <1½ in. from face of framing require protection, min 16-gauge metal shield extending ≥4 in. beyond plates	2426.7	MFR

TABLE 19 APPLIANCE VENTING CATEGORIES ◆ IRC 2403 UMC 224

Category	Condensation	Static Pressure	Typical Vent
I	No	Nonpositive	B Vent
II	Yes	Nonpositive	Per MFR
III	No	Positive	Per MFR (Stainless Steel)
IV	Yes	Positive	Per MFR (Plastic)

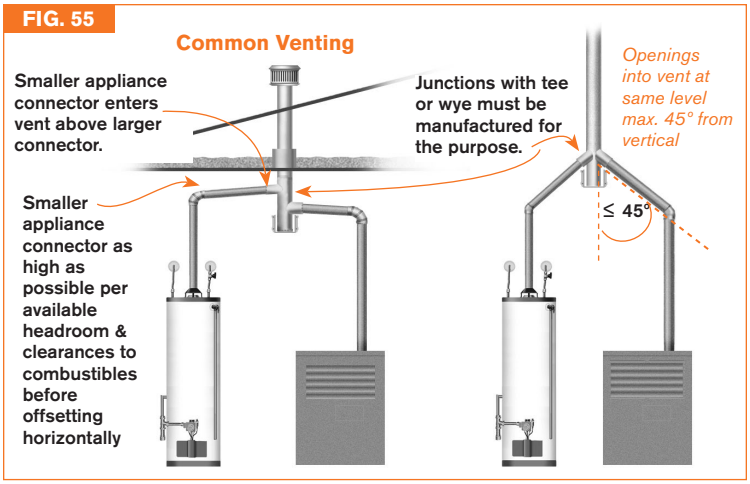
Vent Connectors

	21 IRC	21 UMC
☐ Connector required unless direct-attached vent	2426.2&2427.10.1	802.10
☐ Joints & connections require screws or AMI	2427.10.6	802.10.5
☐ Clearance to combustibles 6 in. for single-wall	2427.10.5	802.7.3.3
☐ Slope upward min ¼ in./ft. toward vent F55	2427.10.8	802.10.6
☐ Single-wall connector max run 75% of vertical rise	2427.10.9	802.10.7.1
☐ Type B connector max run 100% of vertical rise	2427.10.9	802.10.7.2
☐ No single-wall in unconditioned attics or crawlspaces	2427.10.2.2	802.10.1.1
☐ No single-wall through interior wall, floor, ceiling	2427.10.14	802.10.12

Appliances with Common Venting

☐ 2 draft-hood-equipped appliances: common vent or common connector must be ≥ largest connector/draft hood + 50% of smaller flue collar outlet	2427.6.9.1(3) & 2427.10.3.4	802.10.2.3
☐ Join smaller connector to common vent at highest level consistent w/ available headroom & required clearances F55	2427.10.4	802.10.3.1
☐ Connectors ≤45° of vertical OK at same level F55	2427.10.4.1	802.10.3
☐ Junctions w/ tee or wye MFR for the purpose F55	2427.10.7[33]	n/a

FIG. 55



Gas Vent Entering Masonry Chimney

	21 IRC	21 UMC
☐ No common venting solid fuel & gas appliances	2427.5.6.1	802.5.8
☐ Must be lined w/ clay or metal EXC	2427.5.5.1[34]	802.5.7.1
• Like-for-like appliance if chimney passes inspection	Ø[34]	802.5.7.1X
☐ Cross-sectional area ≤7× size of draft hood outlet	2427.5.4(2)	802.5.5(2)
☐ Height & clearances above roof – see *p. 12*		

Single-Wall Vent

	21 IRC	21 UMC
☐ Not allowed in dwellings & residential occupancies	n/a	802.7.3
☐ Run from appliance space directly to outside	2427.7.4	802.7.3.1
☐ May not originate in attic or pass through inside wall	2427.7.6	802.7.3.2
☐ Clearance to combustibles min 6 in.	2427.7.8	802.7.3.3

B Vent Termination

☐ Extend above roof & min 5 ft. above flue collar EXC	2427.6.5	802.6.1
• 6 ft. for fan-assisted Category I appliances	2428.2	803
☐ If vertical surface within 8 ft., vent must terminate min 2 ft. higher than any part of building within 10 ft. horizontal F56	2427.6.4	802.6.2
☐ Min height above roofs T20	2427.6.4	802.6.2

FIG. 56

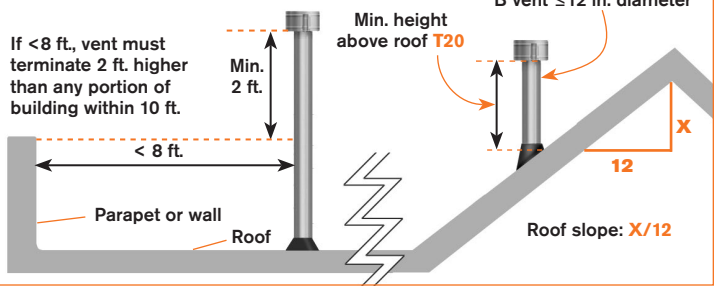


TABLE 20 B VENT TERMINATION ◆ IRC T2427.6.4 UMC T802.6.1

Roof Slope	Min. Height (ft.)	Roof Slope	Min. Height (ft.)
Flat to 6/12	1	> 11/12 to 12/12	4
> 6/12 to 7/12	1¼	> 12/12 to 14/12	5
> 7/12 to 8/12	1½	> 14/12 to 16/12	6
> 8/12 to 9/12	2	> 16/12 to 18/12	7
> 9/12 to 10/12	2½	> 18/12 to 20/12	7½
> 10/12 to 11/12	3¼	> 20/12 to 21/12	8

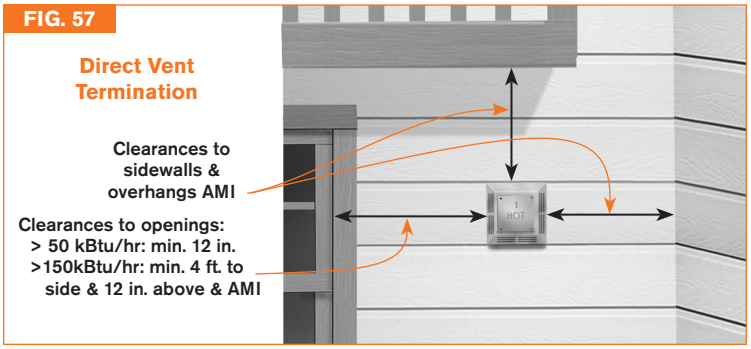
Forced Draft Systems (Cat. III & IV)

	21 IRC	21 UMC
☐ Forced draft systems L&L & installed AMI	2427.3.3(1)	802.3.3
☐ Forced draft system must be gas-tight	2427.3.3(3)	802.3.3.2
☐ MFR instructions must identify specific plastic type	2427.4.1	802.4.1
☐ Plastic joint primers must be contrasting color	2427.4.1.1	802.4.2
☐ No common venting natural & forced-draft systems	2427.3.3(4)	802.3.3.3
☐ Terminate min 4 ft. to side or below or 1 ft. above building openings & min 1 ft. above ground level	2427.8(2)	802.8.1
☐ Cat. IV vents in outside wall min 10-ft. horizontal separation to openings in adjacent building unless 2 ft. above or 25 ft. below	2427.8	802.8.5
☐ Collect & dispose of condensate from vent	2427.9	802.9

Direct Vent Termination: Clearance to Openings

☐ 0-10 kBtu/hr min 6 in., >10-50 kBtu/hr min 9 in., >50 kBtu/hr min 12 in.	T2427.8	802.8.2
☐ >150kBtu/hr AMI & min 4 ft. horizontal or below openings or 1 ft. above openings F57	T2427.8	MFR

FIG. 57



PANELBOARDS (LOAD CENTERS)

Location and Enclosures	21 IRC	20 NEC
☐ Working space min 30 in. wide × 3 ft. deep F61	3405.2	110.26A1&2
☐ Working space to floor & min 6-ft. 6-in. height F61	3405.2	110.26A3
☐ No panels in clothes closet or bathroom	3705.7	240.24D&E
☐ Not to be located over steps of a stairway	3705.7	240.24F
☐ Recessed panels flush w/ surface in combustible construction, max ¼-in. setback in noncombustible construction (steel studs)	3705.7	240.24F
☐ Panelboards may not be installed in face-up position	n/a	408.43[41]
☐ ¼-in. air space behind surface-mounted metal panels in damp or wet location	3907.2	312.2
☐ Circuit directories to distinguish each circuit from all others	3706.2	408.4A
☐ Open knockouts & missing cover twist-outs closed	3907.5	110.12A
☐ Max height of operating handle of breaker 6 ft. 7 in.	3705.7	240.24A

Wiring and Overcurrent Devices		
☐ No grounding of neutral after service EXC F63	3607.2	250.24A5
• Existing separate structure w/ no parallel metal path	3607.3.2	250.32BX
☐ Subpanel neutral isolated from enclosure F63	3908.7	408.40
☐ Only 1 wire per breaker terminal unless L&L for 2	3406.10	110.14A
☐ Each neutral requires individual terminal	3706.4	408.41
☐ Overcurrent protection per T25	3705.5	240.4
☐ Torque all terminals per labeling	3406.12[42]	110.14D[42]
☐ Breaker brand and models L&L for panel	3403.3	110.3B
☐ Backfed breakers mechanically secured in place EXC	3706.5	408.36D
• Output circuits from listed utility-interactive inverters	n/a	705.12E
☐ Handle tie or single handle for multiwire circuits F63	3701.5.1	210.4B

FIG. 62

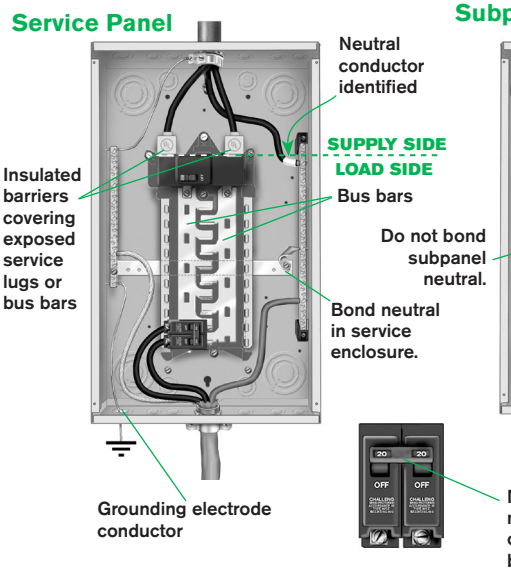
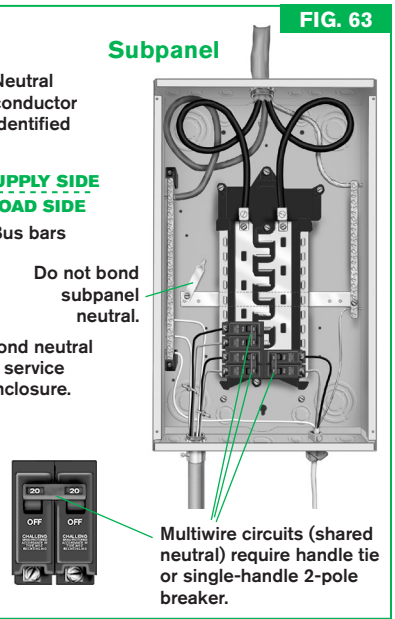


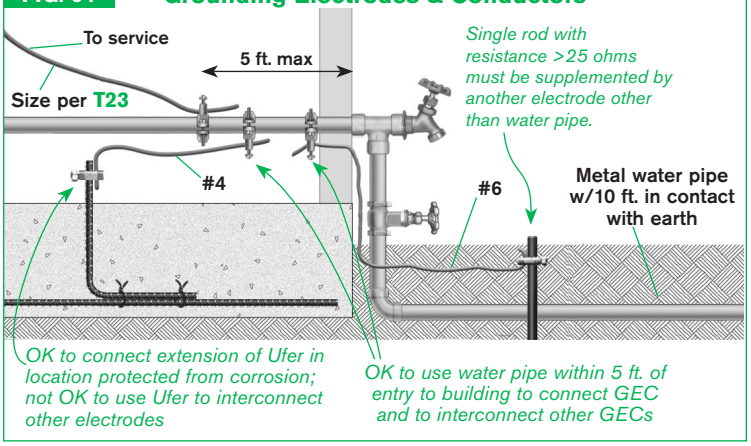
FIG. 63



GROUNDING & BONDING

Grounding Electrode System (GES) F64	21 IRC	20 NEC
☐ Use metal water pipe if ≥10 ft. in contact w/ soil	3608.1.1	250.52A1
☐ Water pipe cannot be only grounding electrode	3608.1.1.2	250.53D2
☐ Bond around water meters, regulators, etc.	3608.1.1.2	250.53D1
☐ "Ufer" = 20-ft. min #4 rebar or min #4 Cu bare wire in concrete footing, foundation, or pier in contact w/ earth EXC	3608.1.2	250.52A3
• Not required in existing buildings where steel not accessible w/o removal of concrete	3608.1X	250.50X
☐ Rod min 8 ft. of soil contact & flush to ground level	3608.1.4.1	250.53G
☐ If resistance >25 ohms, install 2nd rod ≥6 ft. from 1st	3608.4	250.53A2&3
☐ Each structure w/ >1 branch circuit requires GES	3607.3	250.32A
☐ Ufer not OK for interconnection of GECs	3611.5[43]	250.68C3[43]
☐ Connections to water pipe ≤5 ft. of entry to building	3608.1.1.1	250.68C1

FIG. 64 Grounding Electrodes & Conductors



Clamps	21 IRC	20 NEC
☐ Buried clamps L&L for direct burial (marked "DB")	3611.1	250.70
☐ Cu water tubing clamps L&L for Cu tubing	3611.1	250.70

Grounding Electrode Conductor (GEC)		
☐ GEC must connect to incoming service neutral	3607.2	250.24A
☐ Protect #8 in raceway or cable armor	3610.2	250.64B
☐ #6 following building contour OK w/o protection	3610.2	250.64B
☐ Size GEC to T23 EXC	T3603.4	T250.66
• #6 largest required size if dead-ends at rod	T3603.4	250.66A
• #4 largest required size if dead-ends at Ufer	T3603.4	250.66B

TABLE 23 GROUNDING ELECTRODE CONDUCTOR & EQUIPMENT GROUNDING CONDUCTOR SIZES TABLE 24

GEC ◆ IRC T3604.4 NEC T250.66				EGC ◆ IRC T33908.12 NEC T250.122	
Cu Service Wire Size	Al Service Wire Size	Max. Service Rating	Cu GEC	Breaker or Fuse Rating	Size of Cu EGC[A]
≤2	1/0	125	8	15	14
1 or 1/0	2/0 or 3/0	150/175	6	20	12
2/0 or 3/0	4/0 or 250 kcmil	200/225	4	30–60	10
>3/0 to 350 kcmil	>250kcmil to 500 kcmil	250/300	2	70–100	8
				110–200	6
>350 kcmil to 600 kcmil	>500 kcmil to 900 kcmil	400	1/0	300	4
				400	3

A. Aluminum (Al) EGCs are sized one size larger than Cu.

Bonding	21 IRC	20 NEC
☐ Bond all available electrodes (water piping, rod, Ufer)	3608.1	250.50
☐ Bond ferrous metal raceways enclosing GEC	3610.3	250.64E
☐ If knockouts (KOs) remain or reducing washers used, bond service raceway fittings w/ bonding jumpers	3609.4.4	250.92B
☐ If no concentric KOs, use bonding locknuts	3609.4.4	250.92B
☐ Bond all metal piping systems capable of becoming energized (hot, cold & gas) at an accessible location	3609.6&7	250.104A&B
☐ EGC of equipment may be used to bond gas	3609.7	250.104B

Intersystem Bonding		
☐ Provide accessible external L&L terminal bar w/ min 3 terminals to bond phone & CATV, min #6 F47	3609.3.1	250.94A
☐ Bar shall not interfere w/ opening service enclosure	3609.3.1	250.94A

Equipment Bonding & Grounding		
☐ Wire EGCs sized per T24	3908.13	250.122A
☐ EGC must provide effective ground-fault current path	3908.4	250.4A5
☐ Earth is not an effective ground-fault current path	3908.5	250.4A5
☐ RMC, IMC, EMT, AC cable armor, electrically continuous raceways & surface metal raceways OK as EGC	3908.8	250.118
☐ Remove paint from contact surfaces of grounding equipment unless using threaded fittings listed for grounding	3908.18	250.12

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

BUILDING

1. (**p.1**) All storm shelters now require permits.
2. (**p.1**) Common wall rating applicable when it is also the LL.
3. (**p.4**) 10-ml. barrier is required for this edition–check local amendments.
4. (**p.4**) Vents to be near external corners–previous edition said all corners. A new exception also exempts these if cross-ventilation is provided.
5. (**p.6**) BWPs can no longer be entirely on one side of the BWL.
6. (**p.6**) Sheathing no longer required on interior cripple walls.
7. (**p.7**) The 2018 IRC allowed the use of collar ties or ridge straps in lieu of a ridge board. The 2021 edition requires either (1) a gusset or (2) a ridge board with collar ties or ridge straps.
8. (**p.7**) Specification that ridge straps be min 1¼×20 ga., 3 nails each rafter.
9. (**p.8**) Allowance for long ties to attach to WSP, not necessarily to studs.
10. (**p.9**) 6-in. O/C field nailing now if sheathing ≤¾ in.
11. (**p.10**) New tables added for snow loads on decks.
12. (**p.10**) Wood supports exposed to weather must be PT or NDW.
13. (**p.10**) Clarification on stairways that are not within the scope of the code.
14. (**p.10**) Changed from 12 ft. 4 in. (148 in.) in previous edition.
15. (**p.11**) Live load design for guards that are not hand-ails now considered only in vertical downward direction or horizontally away from walking surface.
16. (**p.11**) Height now measured to actual opening, not to height of sill.
17. (**p.11**) Allowance for smaller openings for additions or change of use.
18. (**p.11**) Rise and run of area well stairs was not previously defined.
19. (**p.12**) The door must now be self-latching as well as self-closing.
20. (**p.12**) Kitchen windows exempt from being openable if local exhaust provided.
21. (**p.12**) Allowance for height to beams is same as height for egress door.
22. (**p.13**) Garage doors now require manufacturer's label.
23. (**p.14**) Prior code exempted repairs for plumbing & mechanical; 2021 now requires CO alarms when such work involves fuel-fired appliances.
24. (**p.14**) Listing and marking referred to in F25 is new and now mandatory.

PLUMBING

25. (**p.15**) The 2018 IRC required only a 5-ft. head for DWV rough-in.
26. (**p.16**) The UPC allows an existing 1½-in. drain for a tub if converting to a shower. May contradict the requirement for a 2-in. area drain strainer.
27. (**p.16**) Former limit was 3-in. pipe to 4 WCs on vertical drain, 3 on horizontal.
28. (**p.16**) Explicitly allows a commonly followed standard practice.
29. (**p.18**) Could be applied to prohibit air-chamber water hammer arresters.
30. (**p.20**) TPRV drain must terminate in observable location.
31. (**p.21**) Previous editions required sediment trap upstream of flex connector.
32. (**p.21**) Added clarity regarding arc-resistant jacketed & coated systems.

MECHANICAL

33. **(p.23)** Wye or tee fittings can no longer be fabricated in the field.
34. **(p.23)** 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.
35. **(p.24)** Rule for securing within 6 ft. new to this IRC edition.
36. **(p.24)** The UMC has adopted several ventilation requirements consistent with energy codes and ASHRAE 62.2.

ELECTRICAL

37. **(p.25)** No longer allows exception to barrier rule for 2-6 disconnects.
38. **(p.25)** Each service enclosure requires a single main disconnect.
39. **(p.25)** An exterior emergency disconnect required for first responders.
40. **(p.25)** New or replacement services now require a surge-protective device.
41. **(p.26)** Explicit rule that panelboards may not be in face-up position.
42. **(p.26)** Means other than calibrated torque test may be approved locally.
43. **(p.26)** Ufer cannot be used to interconnect other GECs.
44. **(p.27)** In addition to the required 20A circuit receps near the sink, other recep outlets are allowed and do not need to be on 20A circuits.
45. **(p.27)** Other garage outlets, such as for vehicle door openers, not allowed to be on the required 20A circuit for receps in each vehicle bay.
46. **(p.27)** All countertop receps can be on the side of a cabinet in this edition. *In the next (2023) edition, no required outlets are on the side of a cabinet.*
47. **(p.27)** This edition expanded the required locations of these receps. The next edition will not require any, other than infrastructure for future outlets.
48. **(p.27)** This zone now excludes recep outlets unless the room is <3 ft. wide, in which case the outlet goes on the opposite wall of the tub/shower.
49. **(p.27)** Previously only applied to attached decks or balconies.
50. **(p.28)** Now applies to all receps rated 250V, such as clothes dryers if located in an area, such as a laundry room, where receps require GFCI.
51. **(p.28)** Now applies to all basement receps, not just unfinished basements.
52. **(p.28)** The 6-ft. measurement now includes a cord passing through a door, such as the cabinet door in front of a food-waste grinder.
53. **(p.28)** The 6-ft. distance is now the conductor distance between enclosures; it does not include the wiring within the enclosures.
54. **(p.28)** DW cords passing through cabinet require a protective grommet.
55. **(p.28)** Boxes in areas w/ potential use as paddle fan require listed fan boxes. Previous requirement was to include a control conductor.
56. **(p.28)** GFCI protection now required. If adopted locally, a temporary amendment delays implementation of this rule to September 2026.
57. **(p.28)** New requirement that all switches be listed.
58. **(p.29)** 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.
59. **(p.29)** Clarification that a pull-down ladder is not a stair for this rule.
60. **(p.30)** Appliances <¼ hp are part of general lighting load & are not counted as separate appliances for load calculation purposes.
61. **(p.30)** The first 4 EGCs count as one volume allowance based on the largest EGC; a ¼-volume allowance is required for each additional EGC.
62. **(p.30)** Replacement pool pump motors require GFCI protection.

For codes, commentaries, and further analysis of changes in this cycle, see https://codes.iccsafe.org.

Benjamin Franklin was chosen as the main character in our illustrations for a number of 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 made major contributions to each of the four main disciplines of building inspection: Building, Plumbing, Mechanical, and Electrical.