

Highlighting Guide for Residential Builder

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Place Tabs in the front (Table of Contents) and in the back (Index) of each book. Locate the **Bold** type in both locations & highlight. Bring a few extra colored highlighters to your exam prep class.

International Residential Code

2018	2021	Keywords	Information
56	3-32	Table R301.5 Loads , live	Determine the live loads using the table (PSF)
63	3-39	R303.1 Glazing , aggregate.	All habitable rooms shall have 8% of the floor area (windows)
64	3-40	R304.1 Room , min. size	Every habitable dwelling shall have one room 70 SF minimum & R305.1 Height , ceiling, minimum ceiling height for any habitable shall be 7'
66	3-41	Figure R307.1 Water closet .	Center line 15" off wall & 21" knee clearance
65	3-43	R308.4 Glazing	Safety glass is required in hazardous locations
70	3-46	R310.2.2 Emergency escape	Window sills used for rescue shall be no higher than 44"
71	3-48	R311.2	The required width of an exit door shall be 36"/32"
72	3-48	R311.3 Landings	A landing outside of an egress door must be 36" deep
72	3-48	R311.7, R311.7.1 Stairways	Stairs shall be 36" wide.
72 73	3-48 3-49	R311.7.2 and R311.7.5.1 Guards Stairways , headroom	Risers shall not exceed 7-3/4", Headroom - 6'-8"
72 73	3-49	R311.7.8.1 Handrails transitions @ winder treads	height must be between 34"-38" high. Exception # 2
74	3-51	R311.8.2 Ramps , protection against	landings perpendicular to ramp shall be at least 36"

2018	2021	Keywords	Information
79	3-56	R317.1 Decay or Protection , against decay and termites	protection Untreated floor joist 18" while Girders are only 12" off ground
84	3-62	R322.3.3 Building planning	Storm shelter All buildings erected in coastal hazard areas shall be supported on pilings or columns
89	4-1	R401.3 Foundations	The grade away from foundation walls must be 6" of fall within 10'.
89	4-1	R401.4.2 Table R401.4.1 Foundations	Table of bearing capacity of different soils. Sedimentary rock 4,000 psf.
90	4-2	R403.1 Table R402.2 Concrete , Compressive strength	Minimum compressive strength Table for concrete in weathering potential
95 161	4-6 5-21	Figure. R403.1(1) Footings or R506.1 Concrete , Floors (on ground)	The minimum thickness of a concrete slab is 3-1/2".
99	4-10	R403.1.4 Footings , Requirements	The bottom of footings must be below the frost line & 12" below undisturbed ground surface
99	4-10	R403.1.5 Foundations	The bottom of the footing must not slope more than 10% slope
99	4-10	R403.1.6 Anchor bolts	Spacing of anchors for sole plates 6', (1/2" 7" into concrete)
112	4-23	Table 404.1.1(1) Foundation , Walls or Walls , Foundation	Walls use this table for plain masonry wall height.
127	4-40	R404.1.6 Foundation , Walls or Walls , Foundation	Masonry walls must extend 6" above finished grade.
130- 131	4-42	R405.1 Drainage , Foundation	foundation gravel drains shall extend at least 1' beyond the footing & at least 6" above the top of the footing

2018	2021	Keywords	Information
132	4-43	R406.1 Waterproofing , and Dampproofing	Dampproofing use 3# per square yard of acrylic modified cement. No preparation of the wall is required prior to parging the wall
133	4-44	R408.2 Crawl space or under floor space or Access To crawl space	Ventilation openings shall have one square foot / 150 square feet of crawl space; 3' from corner, foundation vents not required.
133	4-45	R408.4 Crawl space	Access to under-floor space through the perimeter wall 18" X 24" minimum
137-138	5-3 to 5-6	Table R502.3.1(1) & (2) Spans , Wood (allowable)	Wood, species use tables for span, careful about loads!
141	5-7	R502.6 Joist , Bearing or Wood , Floor construction	The ends of a wood joist must bear at least 1-1/2" on wood or metal & 3" on masonry
143	5-8	Figure R502.8. Notching , Wood joist	Wood joist Notching the ends of joist shall not exceed ¼ the joist depth.
141 186-188	5-7 6-17 to 6-18	R502.5 Table R602.7(1) - (3) Girders	Determine girder & header spans using tables
145	5-11	Table R503.2.1.1(1) Span	wood Determine from table the span rating & total load of plywood
161	5-25	R506.2.3 concrete , Floors on ground	floors on ground or Floors , concrete on ground The stone base under concrete slab should have a 6 mil polyethylene with 6" lapped joints
177	6-2	R602.3.2 Wood , Walls	walls End joints in top plates of wood frame walls must be staggered 24"
174	6-3	Table R602.3(1) Wood walls	The table determines the size & number of nails to nail boards
181	6-9	Table R602.3(5) Stud , Wood	spacing

2018	2021	Keywords	Information
178	6-12	R602.6 Notching , Wood studs	Load bearing studs may be notched 25% & 40% for non-load bearing
266	6-97	R606.4.4 Parapets	masonry wall limited to 6", unreinforced solid masonry parapet wall 8" thick & height limited to 4 X thickness; unreinforced hollow parapet walls must be 8" thick & height limited to 3 X its' thickness.
266	6-97	R606.5.2 Masonry , General	Max. corbel projection shall not exceed ½ the thickness of wall. The unsupported height of solid masonry piers must not exceed 10 X the least dimension. Piers never exceed 4X height.
266	6-97	R606.6.3 Beam supports	Beams, or girders with loads from walls or columns must bear 3" in length measured parallel to beam, masonry not less than 4" thick.
274	6-104	R606.13.2.1 Masonry , cavity wall	Multiple wythe masonry walls, solid headers must comprise at least 4% of the wall surface or using metal ties for bonding one tie per 4-1/2 sq. feet.
361	7-3	R702.3.2 Gypsum , Wallboard or Wallboard , gypsum	wallboard, Wood framing supporting gypsum board shall not be less than 2" nominal.
362	7-4	Table R702.3.5 Gypsum , wallboard	The table determines the spacing of drywall fasteners.
364	7-7	R703.2 Walls , exterior covering or Exterior , covering	Wall sheathing paper shall be asphalt saturated felt that weighs at least 15# per 100 sq. ft. weighs at least 15# per 100 sq. ft.
369	7-12	Table-R703.6.1 Shakes , wood	Determine the exposure for wood shakes & shingles.
376	7-20	R703.8.6 Masonry , veneer	Weep holes shall be spaced no more than 33" on center. Minimum diameter 3/16".

2018	2021	Keywords	Information
384	8-2	R802.3 Ridge board	Ridge boards shall be at least 1" nominal thickness, collar beams. Rafters shall bear at least 1-1/2" on wood & 3" on masonry.
401	8-19	R802.4.5 Purlins	Rafter braces support purlins which support rafters. See Figure R802.4.5
408	8-26	R802.9 Rafters , spans	When headers lengths exceed 4', the headers & trimmers shall be doubled.
428	8-46	R806.2 Ventilation , roof	The total net-free ventilating area for roofs shall not be less than 1 square ft. per 150 sq. ft. of ceiling area.
429	8-48	R807.1 Access , to attic or Attic , access	The rough opening for an attic access must not be less than 22" X 30".
436	9-3	R905.2.2 Asphalt shingles	The minimum roof slope for asphalt shingles shall be 4:12 if one ply of 15# felt underlayment & two plies for lower slopes
436-437	9-3	R905.2.6 Asphalt shingles	In high wind conditions, installed as required by manufacturer.
437	9-6	R905.2.8.2#2 Flashing	Using mineral surface roll roofing is used as open valley flashing, the top layer must be at least 36" wide, while the bottom layer shall be 18" wide.
437	9-6	Table 905.2.8.2 Roof coverings or flashing	This table will determine the minimum thickness of valley lining material.
442	9-12	Table R905.10.3(1) Metal , roof shingles	Minimum thickness is 0.013"/ 0.019 for aluminum
439	9-8	R905.7.1.1 Wood , shingles	Solid sheathing is required for a wood shingled roof when the mean January temperature is below 25°F.
440	9-9	Table R905.7.5(1) Wood , shingles	This table determines the exposure requirements for wood shingles

2018	2021	Keywords	Information
443	9-12	R905.11.1 Roofing , modified bitumen	The minimum slope for a modified bitumen roof is 1/4 unit vertical in 12 units horizontal (2 %).
445	9-15	R908.5 Roof , Reroofing clay tiles	When reroofing a clay tile roof, the flashing may be reused if it is not rusty or damaged.
450	10-4	R1001.11 Materials , combustibles	Wood framing must be at least 2" from any masonry chimney.
452	10-6 to 10-7	R1003.9 & .10 Chimneys , termination	Chimneys shall be terminated at least 2' higher than a point 10' away from the roof.
453	10-7	R1003.12 & .13 Chimney , flue lining, multiple flues	Clay flue linings must extend 8" above the enclosing walls. A 4" thick masonry wall must be constructed between two flues located in the same chimney.
455	10-10	R1003.20 Chimney , crickets	Chimneys wider than 30" must have a cricket installed
459	11-1	N1101.5 Energy Conservation	Insulation labeling requirements (look @ #1 thru #8)
504	14-2	M1408.3 Floor furnaces	location conform to 1 thru 7 items listed; Floor furnace registers not less than 6" from wall
504	14-2	M1408.4 Access , to floor furnace	to floor furnace trap door sized 22" X 30" to allow replacement parts
504-505	14-3	M1408.5 Floor furnace	installed 6" off ground
505	14-3	M1411.3 Heating & Cooling	lope
510	15-2	Table* M1502.4.6.1 Dryers	Clothes dryer max. length 35'
513	16-1	M1601.2 Duct , Material	Maximum length 10" Vibration isolators

2018	2021	Keywords	Information
513	16-2	Table* M1601.1.1 Duct Const.	Galvanized 13" round duct; ½ wg Metal thickness is 0.013"
515	16-3	M1601.4.8 Duct	shall be installed with not less 4" separation from earth
520	18-2	Table* M1803.2 Venting Mech. Chimney & vent connectors	Thickness for single-wall metal 5" diam. connector 26 gage or 0.019"
520	18-3	M1803.3.2 Connectors	Less than 75% height above the connector.
527	21-1	Table M2101.9 Piping, Support	Hanger spacing intervals for 2" installed midway. footnote A
533	22-1	M2203.2 Fuel oil piping, fittings, & connections	Supply piping to burners and appliances 3/8" pipe or 3/8" O.D. tubing, type L copper.
537 538 541 541 543	24-2 24-2 24-6 24-6 24-7	Section G2403 Access (To), Brazing, Point of Delivery, Ready access (To), Vented Appliance Categories	General Definitions General Definitions General Definitions General Definitions General Definitions
545	24-9	G2407.5 Indoor combustion air	The required volume of indoor air shall be determined in accordance with sections
545	24-9 to 24-10	G2407.5.1 – G2407.5.2	except that where the air infiltration rate is known to be less than 0.40 ACH, section G2407.5.2 shall be used.
546- 547	24-10 to 24-11	Figures* G2407.6.1(1) & (2)	
548	24-13	G2407.10 Fuel oil	Louvers & Grilles 25% metal and 75% wooden louvers

2018	2021	Keywords	Information
557-577	24-19 to 24-39	Tables*G2413.4(1) thru Table*G2413.4(37)	Know given different pipe sizes & fuel description obtain capacity fuel per hour to appliance.
621	26-2 26-3	Section P2605 Support of piping or Piping , Support Table*P2605.1	For steel pipe 12' max. horiz. spacing; 15' vertical
623	27-1	P2703.1 Tail Pieces	Not <u>less than</u> 1-1/2" diameter for sink or 1-1/4" lavatories.
625	27-3	P2708.1 Shower , stall dimensions	Shower stalls dimensions 30" X 30" minimum. P2708.4 Shower control valve. Water temp. high limit stop 120°F
628	27-6	P2721.2 Bidets	Maximum water temperature 110°F
631	29-1	P2901.2.2	Distribution pipe labeling & marking purple for non-potable water
635	29-5	P2903.3.1 Water pressure	Maximum not greater than 80 psi
636	29-6	P2903.7 Water , Supply & distrib	Size of water-service mains, branch mains & risers; not less than ¾" diameter.
665	30-3	P3002.3.1	Drainage ¼ unit vertical & 12 units horizontal or simply 2% slope to move solids
668	30-6	Table*P3004.4.1	Drainage fixture units (d.f.u.) values for various plumbing fixtures
688	34-2	E3402.1 Notching Electrical	
692	34-6	E3406.3 Conductor , Size	Minimum size of conductors for feeders & branch circuits shall be 14 AWG copper and 12 AWG aluminum.
691	34-5	Figure* E3405.1 Panel boards , clearances.	Access front of the electrical panel clearance of 36"

2018	2021	Keywords	Information
695	35-1	E3501.1 definitions: BONDED (BONDING)	Connected to establish electrical continuity and conductivity.
695-698	35-1 to 35-5	Definitions, Electrical	Ampacity, Bonded (Bonding), Grounded (Grounding), and Service.
698	35-4	Raceway	An enclosed channel of metallic or nonmetallic materials designed expressly for holding wires, cables, or busbars, with additional functions as permitted in the code.
701	36-1	E3601.7	Maximum number of disconnects consist of not more than 6 switches circuit breakers in a single enclosure.
703	36-3	See Table E3603.4	A 1 or a 1/0 AWG copper service-entrance conductor needs a 6 AWG copper grounding electrode conductor.
714	37-2	E3702.3 Fifteen & twenty-ampere branch circuits are both shall be permitted to supply lighting units, or other utilization equipment, or a combination of both.	The rating of any one cord-and –plug-connected utilization equipment not fastened in place shall not exceed 80% of the branch-circuit ampere rating.
713	37-1	E3702.1 Branch-circuit	For luminaires or receptacals for cord-and plug-connected loads up 1,400 volt-amperes or less than 1/4 HP to limits to 120 volts
716	37-4	Table*E3704.2(1) Calculation Feeder, Loads	Applied Demand Factor
717	37-5	Table E3705.1 Ampacity	The allowable ampacities using a copper 10 AWG THHN rated @ 90°C IS 40, with an overcurrent-protection rating of 30 amps (see Table E3705.5.3).
732	39-6	E3904.4 Raceway, Means of support	Raceways as a means of support #1, 2, and 3.

2018	2021	Keywords	Information
731	39-5	E3903.2 Lighting Outlets	Habitable rooms look @ Exceptions 1 &2
732	39-17	E3905.3.1 Boxes , Nonmetallic boxes	Nonmetallic-sheathed cable & nonmetallic boxes, the cable assembly, including the sheath, shall extend into the box not less than ¼ inch through a nonmetallic sheathed cable knockout opening.
759	40-5	E4003.12 Clothes closets	Lighting fixtures are to be installed on the ceiling or wall above the door with a minimum clearance of 12 inches between the fixture and the nearest point of a storage space.

Carpentry

6th ed.	2016 ed.	Topic (in bold type in your index)
61	45	architect's scale , <i>Dimension line</i>
63	50-54	Sections, plan view and elevation view
78	63 & 148	Board feet , calculation of – figure 2-27 also table 15-3
115	111	Tools - carpenter's level produces vertical & horizontal lines
227	246	If back-site to a benchmark of 125.5 is 4.5' and the fore-site to a cut stake is 6'; How much cut should be marked on the stake if the bottom of the trench is 94'
293	323	<i>lumber</i> , Wood (condition of) flooring shrink most in which direction? across the width of the board
315	362	glue-laminated lumber should never be notched
363	399	girder , moisture can swell wood beams clearance – 1/2" (see fig. 15-5)
418	461	Fireblocking required wall heights over 10 feet
490	714	fireplaces, roof details ; crickets for chimney width over – 30"
552	577	Window , design requirements types of windows
573	605	Doors, garage doors sizes for garages thickness – 2"
595	626	roofing , terms & concepts- head and top lap. exposure
608	639	roofing & gutters , hips & ridges, roof ventilation
739	796	cabinets & countertops , installing screw penetrate into stud 1"
804	908	acoustical Insulation for noise in interior walls
857	975	acclimation for wood flooring – 4 to 5 days

Carpentry Plans Estimating Page (2016 ed.)

Plans	
250	estimating & Planning Features – excavation volume
259	estimating & Planning Features – reinforcing bar for footings
261	estimating & Planning Features – concrete & labor for footings
272	estimating & Planning Features – concrete foundation walls
284	estimating & Planning Features – block walls
303	estimating & Planning Features – concrete for flatwork
419	estimating & Planning Features – floor framing
436	estimating & Planning Features – sheathing
540	estimating & Planning Features – roofing framing materials
566	estimating & Planning Features – sheathing panels
643	estimating & Planning Features – strip shingles & underlayment
668	estimating & Planning Features – beveled siding materials
742	estimating & Planning Features – stairway materials
744	estimating & Planning Features – molding & trim
786	estimating & Planning Features – cabinetry
815	estimating & Planning Features – sheet paneling
822	estimating & Planning Features – board paneling
907	estimating & Planning Features – batt insulation
930	estimating & Planning Features – drywall materials
936	estimating & Planning Features – gypsum lath, & nails
987	estimating & Planning Features – strip flooring materials

Contractors Guide to Quality Concrete

3rd ed. pg.	4th ed. pg.	Topics (bold type locate in the index) pages are in the Table of Contents
13	11	Slump tests (ASTM C 143) – consistency
14	20	Air-content (ASTM C 231 & C 173) – for freezing weather
17	14	Basic Types of Portland Cement – Type I, II, III, IV, and V
18	16	Mixing water excess water decreases concrete strength
20	19	Admixtures – High Range Water Reducers - superplasticizer
21	20	Admixtures - Air-Entraining Agents know mechanics & uses
36	48	Basic Foundation Types, Mat, Raft, or Floating Foundations
47	66	Form Material & Hardware - Double head nails, pulling nails
51-52	70	Design of Forms - Concrete weight – 150 pcf (pounds per cubic foot)
68	126	Types of Reinforcement, WWM extend control joint spacing in flatwork
72	100	Concrete Cover for steel, see figure 6.11 & 6.16
75	128	Splicing Reinforcing Steel – minimum length of splice 12”
87-88	121	Contraction (Control) Joints – cut 1/4 slab depth or 1” minimum
123	176	Pumping Concrete mixes, use river gravel as it is rounded
124	178	Vibration – when concrete has become fluid & air bubbles not seen
125-26		Finishing a Slab-on Ground - finishing sequence -screed, float, troweled
127	181	Hot Weather Placement – concrete strength less unless materials cool
129	181	Cold- Weather Placement - Never pour on frozen ground
133	179	Segregation and Poor Consolidation , maximum slump 6”
139	20	Surface Scaling – add air entrainment 5 to 8%

Modern Masonry

8th	9th	Topic, Keywords in BOLD
17	38	Masonry Tools , 1/8" silicon carbide or industrial diamond blade
71	104	Weights & Measures , 27 cf = 1 cy; 1 cf of water = 62.5 lbs.
91	123	Bricks Solid masonry units – 75% bearing surface is considered solid
92-97	124	Efflorescence white stain on masonry, stack bond – weakest
99	132	Mortar joint type- concave or V joint most water resistant
125	160	Two core block stronger than three hole core, use two core with rebar
132-33	169	Joint size for glass block – ¼" joints
143	181	Sills are made from limestone because – no joints for water entrance
147-48	187	Mortar is made from Portland cement and what – hydrate lime ; What is slacking mortar? – Use of lime - type S
151	189	Use mortar within 2 ½ hours, mortar can also be retempered
153	191	Cement increases the strength of mortar
166	206	Types of ties – rectangular, Z and corrugated
181	181	What is furrowing ? See figure 10-4
166	206	Ties positioned how far from edge – 5/8" mortar cover from each edge
214	260	Most common cavity space 2" , wall cavity can be 1" up to 4"
220	265	Wide portion of CMU bed position up- allows more mortar bedding
226	274	Rake control joints depth – ¾"
231	279	Parging ; extended above grade 6"
348	397	WWM should be lapped one stay plus – 2"
485	518	Glossary; slushed joints & tuck pointing terms

Wood Truss

2013 Page	Topic
8	unloading truss, do not lift by the bands
20	Table B2-1, maximum top chord temporary lateral restraint spacing (TCLR) figure B 2-6
38	diagonal bracing – 2 Each #16D nails figure B3-1
53	no loads shall be applied to un-bridged truss
75	figure B10-3 place blocking of sufficient height beneath trusses 8' to 10'
76	figure B10-6, 7 ,8, 9, and 10 Mechanical installation (Trusses up to 30' to trusses over 60')
91	Terms in Glossary– Clinched nail, Diagonal bracing, Splices, Temporary Installation ; restraint/bracing

Gypsum Handbook

7th ed. pg.	Topic (bold type Keywords locate in the T.O.C. , index & Glossary)
3	gypsum panel , -moisture weakens drywall
5	firecode- core ,type X
8	ceiling board , used for soffits use exterior sheathing
15	sheathing limitations , lap felt – 2 inches
22	bead accessories used 90 corners
81	suspended ceilings , frame splices nest furring channels 8”overlap
93	framing, door maximum weight of a door in light gage steel wall – 100#
103	estimating, screws - 1,000 S.F. of gypsum board requires 1,000 screws
103	environmental conditions - minimum temperature 50 degrees F
135	curved surfaces , - maximum arc – 90 degrees
172	joint treatment , - grout open spaces greater than ¼”
206	veneer plaster tough finishes – durable, resist scuffs, gouges
209	control joints maximum distance – 30 feet
314	acoustical ceiling - a runner is not a part of a ceiling system
351	performance requirements , - maximum storage temperature 125°F