

Carpentry & Building Construction

Chapter 19 Roof Assembly & Sheathing

Section 19.1 Assessment Answers

1. A ridge board is usually made of nominal 2" lumber. A ridge beam is made from LVL, glue-laminated lumber, or nominal 4" lumber.
2. The extra width ensures that angled cuts at the ends of the rafters will bear fully on the ridge board.
3. The ridge board for a hip roof is shorter because it does not extend to the ends of the building.
4. For an equal-span addition, the length of the ridge board is equal to the distance that the addition projects beyond the building, plus one-half the span of the building, minus the shortening allowance at the main-roof ridge.
5. The length of the ridge board on a dormer without side walls is equal to one-half the span of the dormer, minus a shortening allowance. The shortening allowance is one-half the thickness of the inner member of the upper double header. The length of the ridge board on a dormer with side walls is equal to the length of the dormer side-wall top plate, plus one-half the span of the dormer, minus a shortening allowance. The shortening allowance is one-half the thickness of the inner member of the upper double header.

Section 19.2 Assessment Answers

1. For a gable roof, lay out the rafter locations on the top plates first. Transfer the locations to the ridge board by laying the ridge board on edge against a top plate and matching the marks.
2. Nailing at the plate first prevents the rafter from slipping out of position as the ridge is being installed.
3. Ceiling-joists ends are nailed to adjacent rafters with three 10d nails, two to each side.
4. Nailing all the jacks on one side of the hip first would push the hip out of alignment and cause it to bow.
5. $\frac{3}{4} \times 48 = 36$; $36 + 1 = 37$; $37 \times 2 = 74$

Section 19.3 Assessment Answers

1. A collar tie is a horizontal framing member that prevents opposing rafter pairs from spreading apart. It also prevents the rafters from bowing inward when weight is placed upon them. In a finished attic, collar ties may also support the ceiling surfaces where the ceiling joists have been omitted, or where ceiling joists run perpendicular to the rafters.
2. A purlin is a horizontal structural member that supports roof loads and transfers them to structural supports. A brace is a member used to stiffen or support a structure.
3. Gable-end studs have the same on-center spacing as standard wall studs. However, each stud is a different length than the studs on either side. Their differences in length are based on a single figure that depends on the pitch of the roof. This figure is called the common difference.
4. Dormers are framed after all of the common rafters are in place and a roof opening has been created.
5. $16'' \div 12'' = 4/3''$; $4/3'' \times 5''$ (unit rise) = $6 \frac{2}{3}''$; the common difference in length $6 \frac{2}{3}''$

Section 19.4 Assessment Answers

1. There are three basic types of cornices: open, box, and closed.
2. A disadvantage of an open cornice is that the underside of the roof sheathing is exposed.
3. A cornice return provides a transition between the rake and a cornice.

4. When a house has open cornices, the cornice return is sometimes handled quite simply. A curved piece of wood can be attached to the underside of the rake trim. This piece is sometimes called a pork chop.
5. To find the perimeter at the ends of the rafters, add 18 inches, or 1.5 feet, to the length and width of the building. Then, find the sum of twice the length and twice the width. $(2 \times 21.5) + (2 \times 36.5) = (43 + 73) = 116$ feet. A sheet of plywood is 8' long, or $8 \times 12 = 96$ " long. $96 \div 18 = 5.333$. Therefore, you can get $5 \times 4' = 20'$ of 18-inch-wide plywood from one sheet. $116 \div 20 = 5.8$. 5.8 rounds to 6. You will need 6 sheets of 4' by 8' plywood to create the soffit.

Section 19.5 Assessment Answers

1. The number in front of the slash indicates the maximum spacing (in inches) of supports when the panel is used for roof sheathing.
2. Place nails approximately 3/8" in from panel ends and edges.
3. Spaces between sheathing boards promote ventilation around wood shingles and shakes, allowing them to dry out evenly.
4. Roof sheathing should have a 3/4" clearance from the finished masonry on all sides of a chimney opening.
5. Reports will vary.