YOUR FREE READER'S COMPANION

The Gazebo Build Pack

A companion to The Backyard Gazebo Building Bible · by Walt Sorensen

Thanks for picking up the book. This is the companion you take out to the site with the string line and the framing square: footing depths, post and beam spans, the octagon roof angles from Chapter 17, and an inspection-ready checklist. Print it, fold it into your tool belt, and keep it where the sawdust is.

Three things decide whether a gazebo stands true for thirty years or sags in five: footings that won't heave, posts set dead-plumb, and a hip roof framed true. Get those three and the rest is just trim work you'll enjoy. — Walt

Footing Depth by Region

Footings have to reach below the frost line, or the whole structure heaves every winter and the roof goes out of true. Check your local code first. These are typical minimums.

Region / climate	Frost line	Typical footing depth
Deep South (no frost)	0	12 in (bearing only)
Mid-Atlantic / transition	24-30 in	30-36 in
Midwest / Northeast	36-48 in	42-48 in
Northern plains / Canada border	48-60 in	60 in
Mountain West	varies	36-48 in (verify locally)

Rules:

- Footing diameter sized to soil and load. 12 in works for most light residential gazebos; go bigger on soft soil.
- Always dig below the frost line. A foot of frost heave will rack a roof you spent a week framing.
- Call 811 (or your local locator) before you put a shovel in the ground. Every time. No exceptions.

Post & Beam Span Quick Reference

Southern Pine or Douglas Fir, light roof load typical of an open gazebo. Always verify against your local code and your actual lumber grade. When you are between two sizes, go up one. A stiff frame is a quiet frame.

Built-up beam max span (perimeter beams)

Beam	Max span
(2) 2x6	~6 ft
(2) 2x8	~8 ft
(3) 2x10	~11 ft
(3) 2x12	~13 ft

Post height (max) by size

Post	Max free height
4x4	~8 ft
6x6	~12 ft

A gazebo carries a lighter roof than a deck carries people, but the posts stand taller and catch wind. Brace

them and verify against local code. When in doubt, run a 6x6 and sleep easy.

Octagon Roof Angles (Chapter 17 charts)

This is the part that humbles people, so here are the numbers from Chapter 17 in one place. A regular octagon's facets meet at 135 degrees, which means every trim miter where two facets join is half of the turn, 22.5 degrees. The hub at the peak is an octagonal block, and eight hip rafters run down from it to the eight posts, with jack rafters filling each facet.

Use this as a quick reference and confirm every cut against your framing square before you commit a board.

Roof pitch	Hip rafter plumb cut	Jack rafter side (cheek) cut	Facet miter
6/12	~26.5 deg	~36 deg	22.5 deg
8/12	~33.7 deg	~34 deg	22.5 deg
10/12	~40 deg	~32 deg	22.5 deg

Notes:

- The facet miter stays 22.5 degrees at every pitch. That is geometry, not framing. The fascia, the trim, and the facet joints all break at 22.5.
- The hip plumb cut climbs with the pitch. The jack cheek cut eases off a little as the roof gets steeper.
- Cut the hips a touch long and trim to the hub. The hub block is octagonal, so each hip lands on its own flat.
- Cut one hip and one jack as test patterns first. Hold them up dry against the hub before you cut the other seven. Measure twice on the ground is cheap; a miscut hip at the peak is not.

Knee Braces, Railings & Cupola

- Knee braces tie post to beam at the corners and stiffen the whole frame against sway. Cut their ends at 45 degrees and through-bolt or lag them, never just toenail.
- Railings, if you add them, run 36 in high with balusters spaced so a 4 in sphere can't pass.
- A cupola sits on the hub and vents the peak. Frame its base square to the octagon and flash it like a small roof of its own.

Cedar Finishing

- Use a semi-transparent penetrating stain, not a film-forming paint. Film peels; stain weathers gracefully.
- Stain dry wood only. Fresh cedar needs to dry out first, and a wet board won't take finish.
- Work in the shade or on an overcast day. Sun flashes the finish off before it soaks in.
- Two thin coats beat one heavy coat every time.

- Seal the end grain. That is where water gets in and rot starts. Hit every cut end.

Inspection-Ready Checklist

Walk this before you call the inspector. It is the list they actually use.

- Footings below the frost line, correct diameter, poured on undisturbed soil
- Posts set dead-plumb and standing on galvanized standoff bases, not buried in concrete
- Perimeter beams through-bolted to the posts, not toenailed
- Knee braces fitted and fastened at every corner
- Hip and jack framing true, backing bevels cut so the sheathing lies flat
- Roof flashed at the hub and at the cupola base, water shedding out and away
- Railings 36 in high, 4 in sphere rule met
- All hardware galvanized or stainless, no rust-bleeding fasteners

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That's the pack. Set your footings below frost and your posts dead-plumb before anything else. Everything above the beam depends on those two being right. When your gazebo is framed and you're standing under it out of the sun, I'd love to hear about it, and in a couple of emails I'll tell you how a quick word from you helps this book reach the next builder.

Plumb and true,

Walt Sorensen