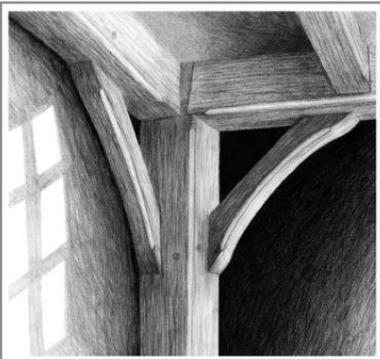


# DESIGNING YOUR BARN

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# Designing your barn

*We can design and frame the barn you need*

## Key Design steps

### **Step 1: Identify the barn's purpose**

A barn can be used in many ways. We will base your design on how you plan to use the building. Is the barn for horses? Hay? For vehicles? A workshop? Barn dances? For each of these uses, you will want certain features. Therefore, start by identifying the main reason you're building a barn.

The large frame shown below and throughout this guide is for a horse barn, but most of the points noted in these pages apply to barns for other uses as well. All of the barns we've built are different from one another; each has particular features that the client wanted.

### **Step 2: Decide on the barn's overall size and internal arrangement**

- *Custom height and pitch:* We can adjust wall height, ceiling height, and roof pitch to your needs.
- *Stalls:* Horse barns are typically based on stall size, with the standard in the industry being a 12' by 12' stall. (In the horse barn shown the stalls are 12' by 14'.)
- *Aisle:* Most people designing for horses also want an aisle to provide access for vehicles to deliver hay and grain, and to provide a space to groom and tack horses. As a result, horse barns are typically either 24' wide with stalls down one side, or 36' wide with stalls on both sides.
- *Storage:* Other needs to consider are grain storage, tack storage, a wash stall, and access to the second floor if a second floor is desired.
- *Second floor:* Generally, a 36' wide barn with a fairly steep pitch (anywhere from 8/12 to 12/12 pitch) generates a large amount of useable space on the second floor. Consider possible uses for the space: hay, horse-drawn vehicle storage, an apartment (which depends on your specific local codes), or workshop. Or do you want to leave it open to roof above?

Because all of the weight of the structure is carried on the posts, you can configure the second floor in a variety of ways; it can be the same size area as the first floor, or a loft, or just an area around the sides for storage—whatever you want.

- *Access:* Whatever you choose for the space, remember to consider access from both the inside and outside.

*(continued)*



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## Building basics

Typically, we design the barn, then cut and raise the frame; the contractor is responsible for the foundation, the sheathing, the windows and doors, the roof, and other finish work. But ideally the entire project should be envisioned before the final plans are drawn and work commences on the site.

### *The barn's foundation*

We recommend digging a foundation for your barn with a 4' frost wall. On top of the foundation we apply a 2"x 8" pressure-treated sill. Then we apply a 4" x 8" timber sill on top of that. We frame our posts into that timber sill.

### *Bents and bays*

Most barns are framed in "bents," with the area between the bents referred to as a "bay." Each bent is constructed of posts and girts that are on each gable end of the barn and at parallel intervals down the length of the barn. For instance, a barn that is 36' x 48' would generally have 5 bents that are 36' wide at 12' on center, totaling 48' in length. Bents are assembled on the site and each is raised as a unit with a crane.

### *Plates and rafters*

Once the bents are raised, we connect the plates (horizontal members at the eaves that the rafters sit on) to the bents with traditional, mortise and tenon joinery. Then we install the rafters.



*Clockwise from top left:*

*Bents raised, one by one;*

*Plate installed to connect bents;*

*Rafters sit on plates.*

## Cupola

If there is a cupola, prior to roof sheathing the cupola base is preassembled, installed, and later capped.

Many barns for livestock and hay storage have a cupola on the roof for ventilation. A cupola also brings light into the center of the building and is an attractive architectural feature. That said, depending on the size and use of the barn and the client's preference, a cupola can be included or omitted.

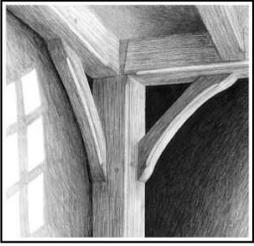


*Cupola cap raised to the roof.*

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*(continued)*

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*(Building basics continued)*

### *Roofing and sheathing*

Barns can be framed with either the common rafter system or the principal rafter/purlin system. We generally use the common rafter system, which means there is a rafter every four feet on center.

The sheathing that you apply to the rafters depends on the roofing materials that you choose. We recommend a 2 x 6 tongue-and-groove planking, particularly if you are using asphalt shingles. This provides adequate structural support, plus you don't see nails protruding through the sheathing.

A metal roof can be applied to the 2 x 6 planking but can also be applied to 2 x 4 purlins nailed onto the rafters at two feet on center. (See the roof manufacturer's specifications.)

Wood shingles can be attached to furring strips nailed onto the rafters with spaces between them, again depending on the type of wood shingles being used.



*Tongue and groove sheathing applied to rafters.*

### *Sidewall purlins and sheathing*

Next the sidewall purlins are installed. These provide the nailing surface for the sheathing. Many people use shiplap pine boards for the sheathing and these are nailed directly to the sidewall purlins. The sidewall purlins, plus the studs, frame the windows and doors, top and bottom, and therefore are placed to accommodate your choice of door and window placement.



*Sidewall purlins and studs frame windows and doors.*



*Handsome barn nearing completion.*

***Using the recommendations outlined in this guide, we can design the perfect barn for you.***

***See next page for more examples of barns.>>***

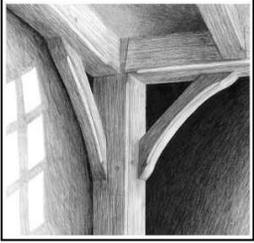
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*Some barns we have built:*



Small "English" barn



Bank barn



Barn/workshop



Decorative exterior



Shed with solar panels



Horse barn with dormers

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