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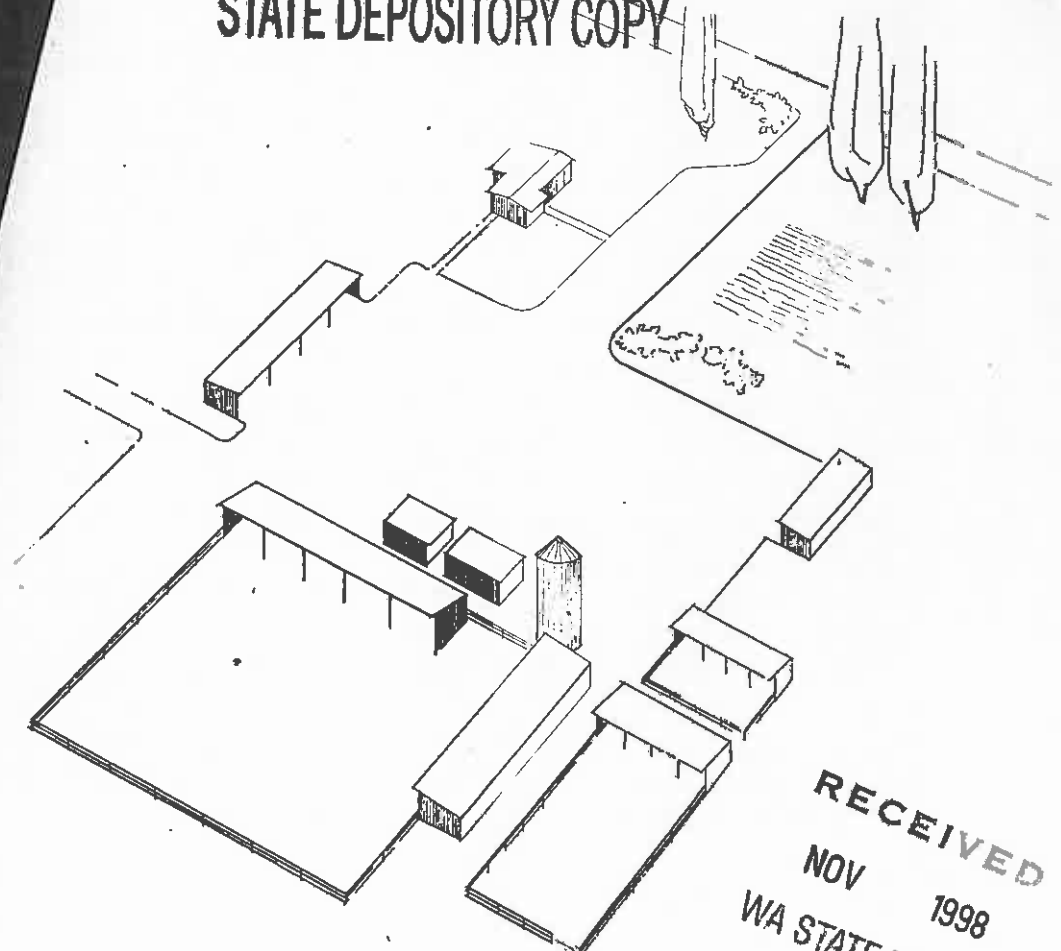
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# PLANNING YOUR DAIRY BUILDINGS

october — 1953

farm structures series

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# Planning Your Dairy Buildings

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Drawings by B. Russell Smith

Cover drawing by H. E. Walla

**D**AIRY FARMING is a highly specialized industry. Like any other specialized field, it requires tools designed to do a special job. You may purchase some tools used in dairy farming. Others, the farmstead arrangement and the dairy structures, must be designed to fit special conditions and the operator's method of work.

The person who must work with the farmstead and the dairy arrangement should organize them. His background and experience help him to decide where each part should go.

The first important decision is the location of the area for dairy buildings in relation to the rest of the farmstead. This location has an effect on the final arrangement of the dairy buildings and on every other building on the farm.

The procedure is the same, whether you are starting a new dairy farm or remodeling an old one. Work out your complete general arrangement first. If you are remodeling, forget for awhile the existing arrangement and work out one which you would like if you were starting new. With this arrangement settled, you can adapt existing buildings and areas to fit this basic plan.

In choosing a location for your dairy structures, keep in mind the following points:

1. Locate them downwind and downslope from the farmhouse.
2. Plan so they are easily accessible from the lanes to the fields, the drive, and the farmhouse.
3. Build them on well-drained soil and near a good water supply.

It is not always possible to choose a location that fits all of these conditions, but consider each possibility and choose the location that fits best.

After you decide on the location, you have a basis for selecting the location of each part that will make up your dairy arrangement. You may choose either the conventional type barn or the loafing shed-

milking parlor arrangement. Only you can decide which type you prefer.

Either method can be an efficient type of housing. A good building arrangement and good management practices save you time, money, and labor. A well-arranged, well-managed loose housing arrangement is the most efficient. But a well-arranged, well-managed conventional barn is a great deal better than poorly managed loose housing.

Don't expect a good arrangement to solve all of your problems. It helps, but you need good management also.

If you choose a conventional type barn, build one. If you choose loose-housing, build loose housing structures. Don't try to use both methods. Studies have shown that combinations are the most expensive and least efficient of all types. Once you have decided which type you want, work out an area arrangement before you worry about sizes and shapes. It takes less time to arrive at decisions if you use rough circles to determine area arrangement than if you draw squares or rectangles. Circles serve the purpose until your basic arrangement is definitely settled. If you try to settle each minor detail at first you may be badly confused. Let your plan grow. It's easier that way.

Your dairy arrangement must last many years, so time spent in planning pays off in dollars and cents. Mistakes are hard to change after the buildings are built. Do a thorough job of planning on paper.

The examples shown in this bulletin are suggested solutions to the most common dairy housing problems in Washington. They are not intended to be final. The method of planning shown can be used for either type of setup.

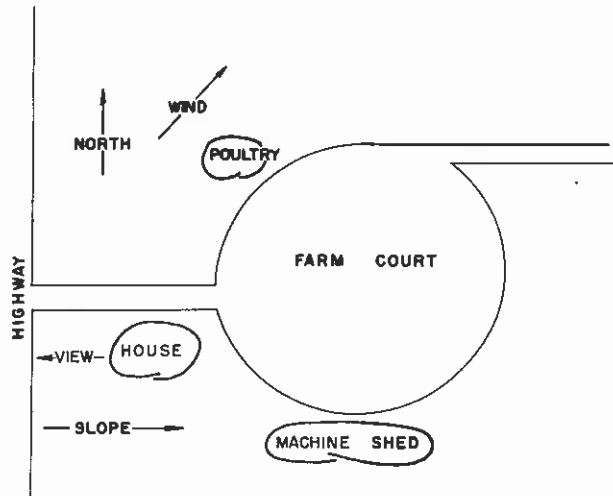
Let's see how the method works. Then you can work out your own plan, arranging it to best suit your needs.

# loose housing



Here is a farmstead with some existing buildings and areas. This is to be a new loose-housing setup. The herd consists of thirty-five milk cows, eight or nine heifers, and eight or nine calves. The heifers will be housed and fed separately. The calves are to be housed in an open shed.

Silage and chopped hay will be fed in the same bunks. The feeding area will be separate from the loafing area. Concentrate will be fed in milking parlor. Let's follow through and see how the arrangement and final plan can be worked out to fit these requirements.

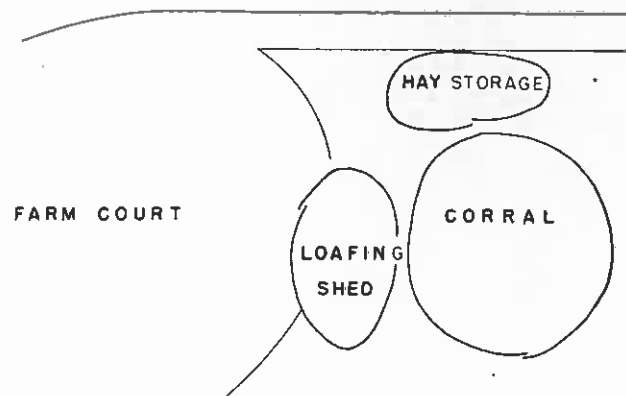
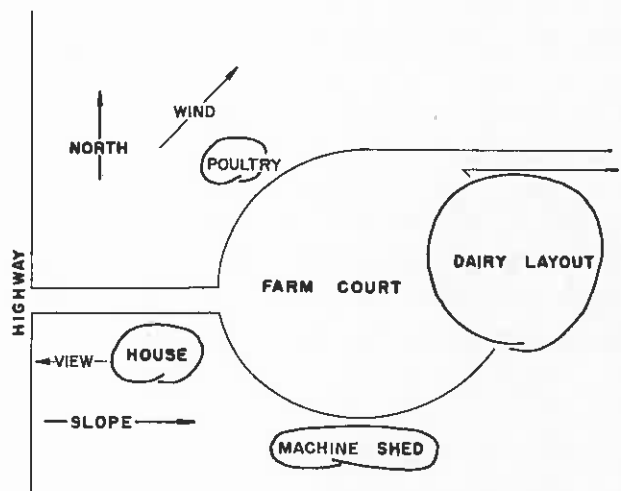


At the left is a sketch of the existing farmstead. Wind direction, slope of ground, view, and north are shown by arrows. Rough circles are drawn to spot existing buildings. There is no need at this stage for elaborate drawings.

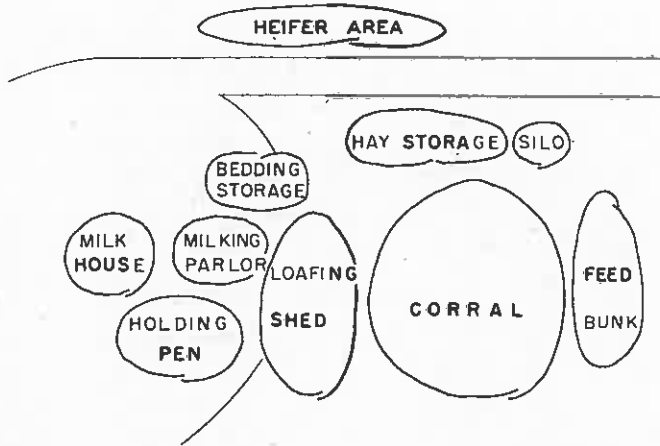
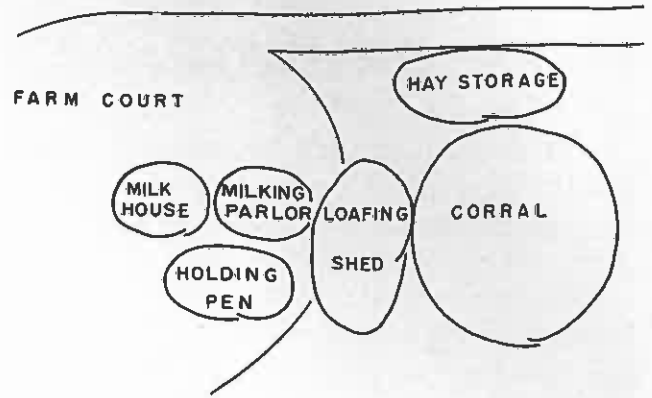
Our next sketch shows a possible location for the dairy arrangement. We are not now concerned with the areas that will make up the dairy layout, but we are interested in the general location. As you can see, we have little choice as to where to spot this area. It should be downwind and downslope from the house, near the lanes to the fields, accessible from the highway and from the house. We will decide the final outline of this area when we plan the new buildings.

The location settled, we are ready to start with the individual area arrangement.

It makes little difference which area we locate first. Here, we start with the milk house. It should be near the milking parlor and be accessible from the farmhouse. The back of the loafing shed should be toward the wind. A holding pen is placed between the milking parlor and the loafing shed.



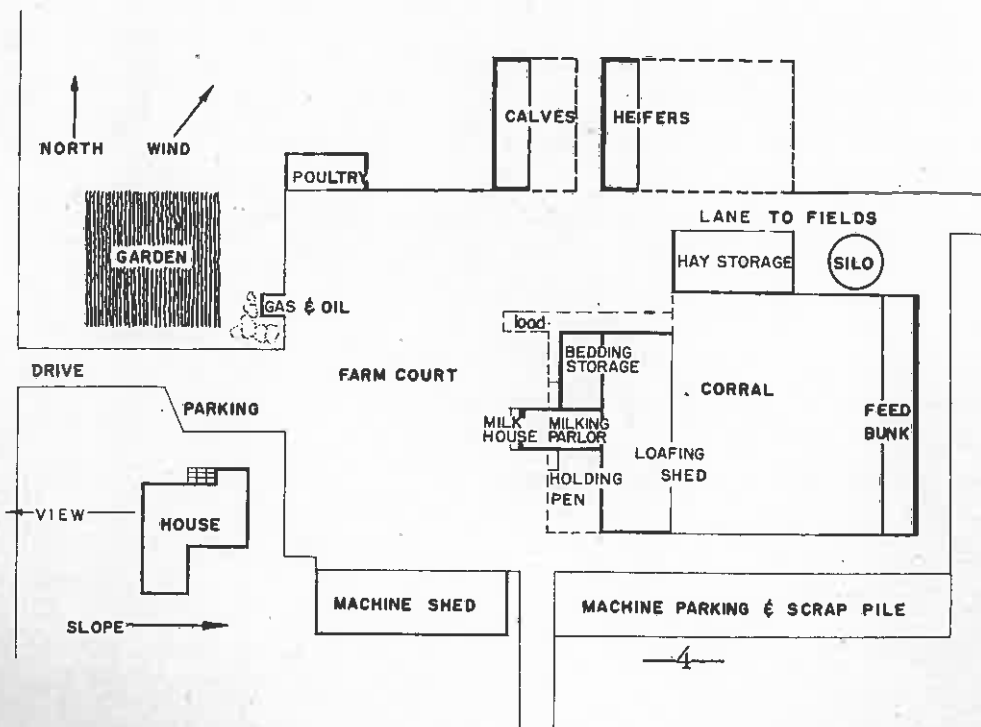
In the sketch at the right, the corral is placed on the open side of the loafing shed. The feed barn, which will contain the feed bunks and the hay storage area, is spotted near the lane to the field. This makes it easy to place feed in the barn when it is brought from the field. The silo is near the lanes to the fields and near the farm court. The bedding storage can be reached from the farm court.



The sketch at the left shows the heifer area across the lane from the feed barns. This serves two purposes. It makes storing hay in the heifer barn easy, and your cows and heifers can be fed with a minimum of walking. The calf barn is near the milk house.

This completes the arrangement. By using the information on pages 7 and 8 you may square it up as shown below.

Below is the final, squared-up plan for this dairy setup. Note that the plan follows closely the arrangement developed above. Check with your local milk inspector before starting to build. Local codes vary. Make sure your arrangement is acceptable if you plan to produce Grade A milk.



# stanchion barn

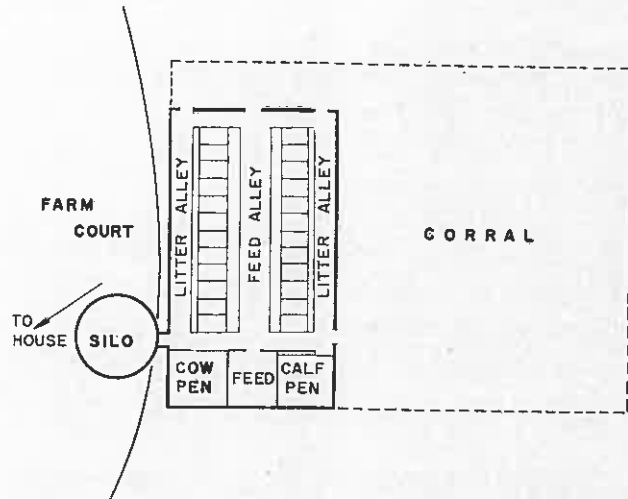
Let's try another example based on a problem that exists in several parts of Washington. Here is an old stanchion barn. The owner wishes to convert to a loafing shed-milking parlor arrangement.

First, check that old barn. If it is in bad condition or if it needs extensive remodeling, it might be cheaper to build a new barn. If the location is bad, it might be wise to move the barn. If you plan to use an existing hayloft in an old barn, be sure you don't remove necessary supports under this loft. In fact, you may need to add some. The same is true if you remove a wall to get an open-type shed. You'll need to replace walls with beams and posts.

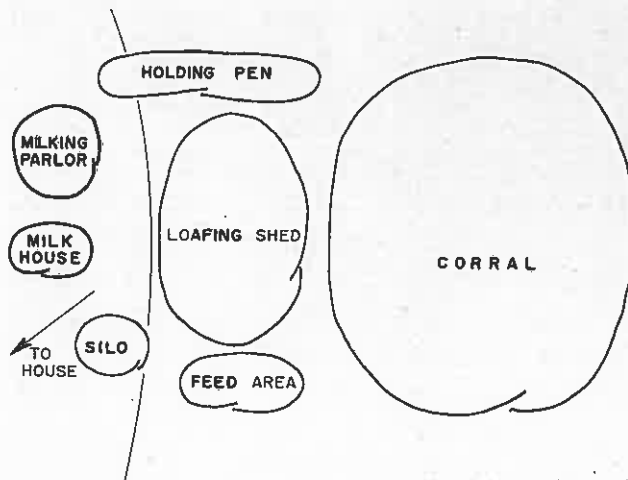
This time we have a 20-cow herd. Young stock and the calves will use the same loafing shed. The feed and storage are to be either in the old barn or in a separate area. If any new buildings are needed, a new milking parlor and milk house have priority. The milking parlor is to be a raised platform type. If possible the old silo is to be used.

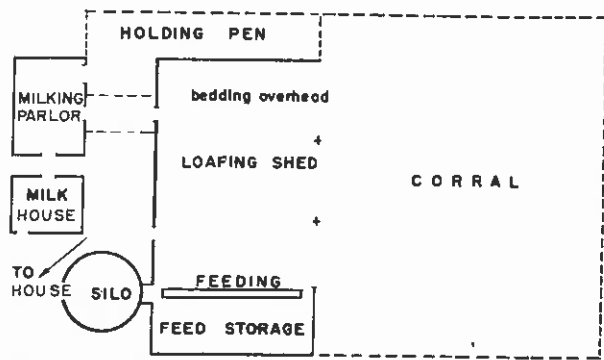
Our first figure is the plan of the old barn. The direction to the house, the approximate farm court location, the silo, and the corral are shown. In an arrangement like this, it is best to forget the existing building for a time. Keep your objective in mind and plan a new arrangement. After your pattern is made, see how nearly you can fit the old buildings into it.

In most cases it won't be difficult to make full use of old structures and come remarkably close to what you want without major changes.



At the right is the pattern that was devised. The milk house is near the farmhouse. The milking parlor is where it belongs, beside the milk house. A holding pen is between the milking parlor and the loafing shed or corral. The loafing shed is downwind, with the corral on the open side of the shed. Feed bunks and feed storage are near the farm court and the lanes. The silo is located so that silage can be fed in the same feed bunks as the hay. The cows can be placed in the holding pen before they go through the milking parlor and back to the loafing shed. Let's take a look at the final setup and see how the old barn fits into this pattern.





In this sketch, we have used the old barn for a loafing shed, feed bunks, and feed storage. The loft was removed and the hay storage placed in one end of the old barn, from the ground up. The existing silo is used. If there had not been enough room in the old barn for feed bunks and storage, they could have been built onto the present building. The corral was left approximately in the same location. There is a new milking parlor and milk house.

It was easy to arrive at a final plan after we had a plan by figuring area sizes and using the old barn wherever possible.

## Check Your Plan

1. Dairy located downwind and downslope from farmhouse.
2. Feed storage near lanes.
3. Milk house nearest farmhouse.
4. Milking area convenient to milk house.
5. Arrangement is convenient and meets code requirements.

## General Requirements

**A**NY SET OF BUILDINGS should serve your farming enterprise in three ways: (1) save labor; (2) aid sanitation; and (3) increase profits. Apply these to any arrangement, before you start construction.

### How Much to Spend

The amount to spend for buildings depends on the amount your cows produce and the price received for their products. Studies indicate that an average of about 10 per cent of the gross income from a cow may be spent on buildings. This percentage must pay back the initial investment and pay the interest on the investment and repairs.

### The Conventional Stanchion Barn

- Advantages**
1. Cows confined in small space
  2. Feeding and milking done in same stalls
  3. Less bedding required
  4. Cows can be controlled

- Disadvantages**
1. Requires more time for milking
  2. Requires more time for cleaning
  3. Injuries occur easily
  4. Original investment is higher

- Stall type**
- Face in—easy to feed, harder to clean and milk.
  - Face out—easy to milk and clean and hard to feed.

Stall Sizes	Average weight	Average width	Average length
Holstein .....	1,300	3'9"	5'2"
Brown Swiss .....	1,350	3'10"	5'2"
Guernsey .....	1,100	3'6"	4'10"
Jersey .....	1,100	3'6"	4'8"

Stalls may be varied in length by use of stanchions that move forward and backward or angled gutters.

<b>Gutter</b>	width—16 inches to 18 inches depth—8 inches at stalls, 6 inches at alley
<b>Corral</b>	not paved—300 to 1,200 square feet per cow paved —100 to 300 square feet per cow
<b>Foundation</b>	Extend footing below frostline, make it large enough to carry load and at least 12 inches above floor.
<b>Floor</b>	Solid—usually concrete with broom or wood float finish
<b>Center alley</b>	8 feet wide so it may be used as drive
<b>Outside alley</b>	Face-in —4½ to 5 feet wide Face-out—Wide enough so feed cart can be used
<b>Manger</b>	24 inches to 36 inches wide 18 inches to 30 inches high Floor of manger 4 inches above barn floor
<b>Built-up front</b>	Feed alley same level as floor
<b>Sweep in</b>	Feed alley raised to manger height
<b>Special pens</b>	At least 10 feet × 10 feet in separate wing of barn or same room as cows
<b>Walls</b>	Easy to clean. Should meet health regulations.

**Lighting** 4 square feet of window per cow and 1 electric light per 400 square feet of floor area.

**Ventilation** Window, flue, or mechanical. Check with ventilating engineer on each design.

## Loafing Shed—Milking Parlor Arrangement

**Advantages**

1. Cows have freedom
2. Initial cost is low
3. Cuts down injury risk
4. Requires little cleaning

**Disadvantages**

1. Requires much bedding
2. Boss cows may be a problem

**Types of loafing sheds** Closed, semi-closed, and open

**Size of shed** Allow 60 to 80 square feet per cow if no feeding is done inside. Allow 40 square feet per cow more if feeding is done inside. Open sheds from 24 to 32 feet deep. Allow from 10 to 12 feet clearance so power equipment may be used.

**Foundation of sheds** Extend below frostline. Treated poles may be used for foundations. Extend concrete or treated lumber from 24 inches to 30 inches above ground so manure pack may build up and not come in contact with untreated lumber.

**Feed areas** Allow 2½ feet of manger per cow. Cover and pave feed areas.

**Holding pen** Allow 15 to 20 square feet per cow

**Isolation pen** At least 10 feet × 10 feet. May be built in loafing shed by movable fence sections.

Calf pens	See Extension Circular 211, <i>Raising Dairy Calves in Open Sheds.</i>
Heifer area	Allow 30 to 50 square feet per head. May be housed with older stock. Allow 1½ feet to 2 feet of manger space per head.
Milking parlor regular stanchion	Stanchion same size as shown for stanchion type barn.
Raised platform	Stanchion approximately 3 feet X 8 feet. See Extension Bulletin 410, <i>Approved Washington Milking Parlors.</i>

### Milk House

Work closely with your milk inspector. If there is a possibility of milk tank pick-up be sure your milk house is large enough (minimum of 300 square feet) and that floors are constructed heavy enough to hold load.

## Feed and Bedding Storage

### Area needed

Alfalfa	.....485 cubic feet per ton
Timothy	.....640 cubic feet per ton
Clover	.....510 cubic feet per ton
Chopped hay	.....225 cubic feet per ton
Baled hay (closely stacked)	.....150 to 200 cubic feet per ton
Straw (loose)	.....1,000 cubic feet per ton
Straw (baled)	.....200 cubic feet per ton
Sawdust and shavings	.....165 to 230 cubic feet per ton
Silage	.....35 to 70 cubic feet per ton
Concentrate	.....40 to 70 cubic feet per ton

## Check Your Plan

- ✓ Does your arrangement fit your farm?
- ✓ Are sizes of your buildings right?
- ✓ Will your setup meet local codes?