FARM SHOP DESIGN: GET IT RIGHT OR PAY THE PRICE
Farm Shop Design Best Practices

- How big to build?
- Staging areas
- Non-shop uses to plan for
The most common question asked for farm shop design is: **How big should I build?**

Here are some things to consider:

- Today’s farm shops are typically **80-foot-wide by 165-foot-long** and up
- Be sure to measure your actual equipment to determine the room needed for various repairs
- Plan your building on what is coming – not what you have. Any building is capable of being added on from the end, but it is extremely costly to add width
Also, it is critical to determine the space needed for:

- Workstations
- Storage of tools and parts
- Offices and computers
- Conference or meeting room
- Kitchen or eating area
- Restroom with shower
- Washer and dryer area
If there are budget limits, you may want to consider building in phases:

- Start with a 72’ x 110’ building shell – with steel ceiling. Your investment to get this done can be as simple as site prep, building shell with ceiling, and partial electric.

- In a year or two – finish off the below grade work such as the plumbing and any underground electric and put in your concrete floor.

- Next step – install the wall insulation and wall finish. Now your final electric and HVAC can be done in the same step – or the following year.
Staging areas with either a solid gravel pad or a concrete apron are essential for the optimal functionality of your farm shop.

Make sure your staging area meets your operation's needs:
• Preliminary washing area before having the equipment come into the shop
• Can be used for additional repair space for maintenance pre- and post-harvest
• Allows minor tasks to be completed outside when weather permits
• Convenient storage area for the project that’s not finished but no longer at the top of the ‘to do’ list for today
One of the often forgotten aspects of the areas around the shop is parking.

- How many employees do you have regularly, and during your peak seasons how many pickups do you need to plan for?

- As the shop tends to become the ‘farm central’, recognize that simply accommodating the parking for those who regularly stop by will be a part of your satisfaction with the building.

- Do you have a truck for field service and maintenance? Will it always be parked in the shop?
NON-SHOP USES TO PLAN FOR

Consider that today's shops are the farm's entertainment center, control center and recreation hall:

- Living quarters for guests
- Many shops now have pool, foosball and ping-pong tables, plus exercise equipment
- Holiday dinners
- Interests of the next generation
ADDITIONAL CONSIDERATIONS
HOW TO SELECT DOORS

Overhead doors and entry doors must be as energy efficient as possible, since the overhead door is one of the largest areas for heat loss in the building.

When choosing an overhead door size, always go wider and taller than what you feel is needed. There is nothing worse than having a beautiful energy-efficient shop that your newest piece of equipment cannot be driven into for repairs.

Today, we feel a 24’ x 15’ overhead door should be a minimum. An electric operator with several remote controls for frequently used vehicles should be a standard part of the package. And a safety stop installed on the bottom astragal should be discussed since commercial operators can damage some types of equipment before they would release.

Size your door with at least 2 feet of side clearance and 1 foot of head clearance for largest equipment. Keep in mind that machinery always grows by a few feet. You can install a 36” service door to save energy.
HOW TO SELECT DOORS

There are almost unlimited options available for hydraulic and bi-fold doors. The bi-fold doors that we offer go up to 70’ wide, and the one-piece hydraulically operated doors come in a variety of sizes ranging from 10’ x 10’ to 80’ x 22’.

Give thought to adding one or two smaller overhead doors for those special pieces which will be regularly parked in your shop. If your primary pickup truck will be housed in the shop you won’t want to be opening a 24’ x 15’ just to get in or out. Consider vertical track to avoid having the track on a smaller door interfere with other activities.
You can never have enough lights in a farm shop!

Windows are a good source of light. When possible, thermal pane windows installed on the south side will give a net thermal gain during the winter months. Natural light is preferred over the workbench by most. However, be sure to understand that windows on any wall other than the south are a loss of heat, so limit windows to only those needed for light or observation.

Also, remember that windows in overhead doors are a loss of R-value and should not be used unless the you feel they are necessary for observation.

General indoor lighting options include a ½ watt fluorescent per square foot floor area, or 2 watts incandescent per square foot floor area. Light-colored ceilings and upper walls help to reflect the light. For indoor task lighting, use double-tube, 4-foot fluorescent fixtures mounted four feet above the workbench, and use incandescent or LED lamps over rotating tools like grinding wheels to avoid the strobe effect. It's recommended to put eight lights along each wall, 10 feet apart, so that when you are working under the combines there is light coming in under the doors.
In general, it is recommended to install a 6” reinforced concrete floor in the shop and wash bay, and 12” thick under the legs of a vehicle lift, with perimeter insulation and vapor barrier.

The thick floor can handle heavy equipment; the vapor barrier reduces moisture migration into the building which can reduce R-values; and the perimeter insulation reduces conduction of cold into the building through the slab.

Will your mechanic projects benefit from a strategically placed crane? Many farmers enjoy the use of jib cranes (mounted to a reinforced section of the floor) to support projects which would be very hard to do otherwise. The base for the crane will be poured independently from the floor itself.

As a reminder, there's no substitute for proper site preparation including good drainage and a proper building site. As a general “starter”, plan for a minimum of 6” of uniform compacted gravel under a 6” concrete floor.
Deciding where to place floor drains in your new farm shop may depend on your operation and how big you plan to build. But it is money and time well spent to go to the extra trouble to do this when you are putting in the floor. However, be sure to check with local regulations about any waste disposal issues.

You will want to think about if you need a triple basin separator and what type of floor drain you will need installed. You can put your drains close to your doors, approximately 2-3 feet in, but this may not be practical if you need to skid anything in or out. You can put your drains in the center of the floor, but it can make the floor slippery. Or you could put the drains in along each side about two feet in, so that you won’t drive over them and they are out of the way.

Consider the location of the floor drain and the challenges it can create for equipment with rollers for moving around the shop such as an engine hoist. In most cases the drain needs to be separated from the areas where equipment assembly / disassembly takes place. Nothing worse than watching that nut you just dropped roll through the grate into the drain!
Whether used for tires, painting or finishing, air lines are an important part of any shop. If you have an office area, put the air compressor on the other end of the shop to decrease noise.

Some farmers have built a ‘room’ to house the compressor simply to reduce the noise factor in the shop. Positioning the compressor on the mezzanine in a corner allows a simple enclosure to be constructed. Allow for adequate intake air with an external louver.

Put an air hose and reel outside somewhere convenient, so when you need to air up tires, it’s easy to drive right up to the hose. Put in more 110/220 outlets than you think you are ever going to use, such as every 10-15 feet.

Schedule 40-type black pipe, copper pipe and aluminum pipe are options for delivery piping. Black pipe is low-cost but requires cutting and threading for installation. Copper is a more expensive option up front, and joints must be "sweated” during installation. Aluminum air piping is less expensive than copper and uses compression fittings for quick and easy installation.
STORAGE AREAS

Designated storage areas are important to maintain a clean appearance of your new shop as well as help with inventory and record-keeping.

Mezzanines are a perfect storage solution so uses which do not require the total height can be used for double duty. When planning your new shop, think about what would be best for your operation. Do you buy oil bulk? In addition, you’ll need to store grease, lubricating equipment, air filters, optimally all in one area. Where should you store the wear parts for tillage equipment? Do you need a separate bulk storage area that is accessible by a semi-truck?

While seed storage does not require the complete climate control of a shop, you definitely want a location which is completely free of any dripping caused by condensation. For savings based on bulk purchase / delivery, you may want a corner of the shop available for seasonal storage.

The best farm shop designs are ones in which everything has a place. This enhances the efficiency and functionality of your work space.
FINISHING TOUCHES

When designing a new farm shop, the actual shop uses help determine the interior finishes to be installed. If noise is a major concern from tools or equipment, acoustical steel should be considered.

Most buildings should have acoustical panels above the 8' level on the walls. If noise is a major concern, acoustical panels can be installed in the complete ceiling. Remember to use blanket insulation above all acoustical ceilings to eliminate possible insulation migration.

In general, the most cost effective use of acoustical panels, is above the 8' level on the walls. Below the 8' level, regular hi-rib panels give a low-maintenance, moisture-resistant and light reflective finish.

Peg board can be installed in areas to hang tools and supplies for easy access. Others prefer 8' high OSB to avoid possible denting of the lower portion of the building's interior. Others install an interior hi-rib steel wainscot.
The ultimate shop interior is an 8' high 3/4" tongue and groove painted plywood finish with acoustical hi-rib panels above on the walls and a steel ceiling. The plywood offers impact resistance, the painted wall surface makes for easy cleaning and lighting, and acoustical panels allow for sound absorption. The regular hi-rib ceiling allows for good light reflectance, easy cleaning and the cost effectiveness of blown-in insulation in the attic.

It can also be helpful to have portable worktables, stacked welders, and tool caddies on wheels to ease the mobility and functional space for repairs.

We have hundreds of farm shop projects available to browse at [www.mortonbuildings.com](http://www.mortonbuildings.com)
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