HORSE FACILITIES HANDBOOK

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MWPS
MidWest Plan Service
A Foundation of Knowledge

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CONTENTS

PREFACE

This handbook has been developed to help engineers, designers, and horse owners, and enthusiasts who are developing new facilities, remodeling existing facilities, making plans for a future project, or doing research about facilities so that their horse will receive the best care as they make a decision on where to board their horse. This book is a revision of and replaces the book titled *Horse Handbook: Housing and Equipment*, MWPS-15, first edition, 1971.

Like the first edition, this book still has a wealth of great construction details, but now has vastly expanded discussions and information on:

- Site selection and site layout,
- Building and stable designs and layouts,
- Manure handling and treatment,
- Ventilation and environmental control, and
- Fire safety.

In addition to the expanded discussions, this handbook now includes detailed information on:

- Roadways that will allow for easy and safe entry to the farmstead,
- Parking and turn-around areas for cars, trucks, trucks and trailers, and semi-trailers,
- Pastures, paddocks, and outdoor facilities,
- Arenas and training facilities,
- Breeding facilities,
- Bulk feed and bedding storage,
- Fencing,
- Water, electrical, and domestic waste designs, and
- Emergency response planning.

People using this handbook will gain knowledge on many design and safety issues including:

- How horse behavior affects design,
- How to design pastures so that a dominant horse will not injure a less dominant horse,
- What are the keys to successfully ventilate a stable and to keep it cool or warm,
- How farmstead and stable layout can increase labor efficiency,
- What to do with the manure that accumulates,
- How to avoid drainage problems, and
- What can be done to minimize the negative effects of an emergency situation such as fire or severe weather.

CHAPTER 4

Pastures, Paddocks, Pens, and Shelters

Most horses and ponies are healthier and act more contented living outside. Outside living areas can be categorized as pastures, paddocks, or pens.

Pastures are well-maintained vegetative areas that are used primarily for grazing and have the added benefit of being an area in which the horse can exercise. Supplemental feeds, especially grain, may be required depending on the type of horse, exercise and work level of the horse, and the quality of the pasture.

A paddock is a vegetative area that allows the horse to graze and exercise. Paddocks are smaller than pastures and must be carefully monitored so they do not become overgrazed or overused. A pasture can sometimes be divided up into a series of paddocks so grazing can be more carefully controlled. Keeping horses in a single paddock will require providing supplemental feeds to the horses. A series of paddocks may or may not require the use of supplemental feeds.

Pens are usually areas of soil that have little or no vegetation. Typically, pens are areas designed to allow a horse to exercise and run around, or pens can be designed as training areas.

When horses are kept outside, provide free-choice shelter. A free-choice shelter is needed so horses can have an area to protect themselves from the severe weather elements such as strong winds, snowstorms, rain, and sun during hot weather.

This chapter will provide information about designing pastures, paddocks, pens, shelters, and wind and snow control devices. Information on fences for pastures, paddocks, and pens is provided in *Chapter 10. Fences,* and information on waterers for horses on pastures or paddocks is provided in *Chapter 11. Utilities.*

Pastures and Paddocks

The success of a pasture or paddock will depend on the forage types available and climate; on soil type, fertility, and slope; and on the number of horses on the pasture or paddock. A vegetative pasture with a good balance of grass and legumes can produce enough protein, vitamins, and minerals to supply the maintenance requirements of most mature, non-working horses and older yearlings without the need for grain supplementation, Figure 4-1. Even with good pastures, lactating mares, growing horses, and hard-working horses will usually need additional energy from grain

Figure 4-1 Horses on pasture.

Three actions that can lead to a successful pasture or paddock are:

- Selecting the proper grasses and legumes.
- Sizing and laying out the pasture.
- Managing the pasture to encourage vegetative growth and minimize weed growth and parasites.

supplementation. In a pasture or paddock, allow horses to have access to salt and mineral blocks at all times.

Selecting Grasses and Legumes

Kentucky bluegrass and common white clover are common species used in a pasture in the northern and eastern parts of the country, but these species can tend to dominate pastures because of their tolerance to grazing. Unfortunately, these species are not very drought resistant and can become dormant during the later summer months.

Common pastures in the Northeast, Midwest, and parts of the South are bluegrass and white clover. Common white clover is not to be confused with alsike clover, which also produces a white flower and looks very similar to common white clover. Alsike clover should not be used in horse pastures because it can cause severe photosensitivity and kidney damage in horses that consume it. Wheatgrasses are common in the subhumid and arid regions in the southwest and northern plains of the country. In the extreme south, bermuda, bahia, and dallies grasses are common. A pasture management specialist can help develop a good pasture and help select grass and legume species based on the region. Contact the local extension service to help identify a pasture management specialist.

If a pasture or paddock is being reseeded then identify grass and legume species that are:

- Compatible to the climate in the area.
- Suitable for the soil conditions.
- Hardy enough for grazing.
- Fast growers with a good root system.

Sizing and Laying Out the Pasture

Horses will consume at least 1% of their body weight in hay or pasture dry matter per day, and more likely will consume about 1.5% of their body weight. Pastured areas used as a main food source for a horse need to be sized to accommodate forage consumption by the horse and to allow for a regrowth and recovery period. In non-arid regions of the country, the general rule of thumb for a managed pasture is to provide 2 to 4 acres per 1,000-pound horse for year-round grazing unless horses are provided supplemental feed. Unmanaged pastures should provide 5 to 10 acres per horse. A pasture using intensive rotational grazing should provide 1.0 to 1.5 acres for each mature, non-productive horse. Owners pasturing horses in arid regions should contact a pasture management specialist for recommendations on sizing a pasture.

Also important is pasture configuration, especially when more than one horse will be in the pasture at the same time. Horses will display a social order of dominance. Pastures should be configured to avoid right angles and areas in which a less dominant horse can be trapped or cornered by a more aggressive horse. More aggressive horses will kick and bite less aggressive horses. If possible, avoid using alleys or traffic lanes that allow horses to go from one pasture to another. Observe horses for aggression. If possible, put aggressive horses in different pastures from less aggressive horses.

In addition to minimizing areas in which less dominant horses can become trapped, provide spacious eating areas. For example, if a pasture has ten horses that are being fed, feed in a spacious area in which at least ten separate piles of hay, preferably fifteen piles, can be scattered about. Hay should be scattered so there is at least 20 feet between hay piles.

Managing the Pasture

Horses are notorious spot grazers. They will tend to overgraze some locations while undergrazing other locations. Overgrazing can lead to increased growth of weeds. Weeds typically are not nutritious, and some weeds can be poisonous to horses.

Good management will increase the productivity of a pasture or paddock and minimize health risks to the horse. From a management and maintenance viewpoint, it is better to have four or five smaller paddocks than one or two large pastures. Continuously grazed pastures usually have lower forage yields, and more weed and erosion problems. As a rule of thumb, do not allow the average pasture grass height to be less than 2 inches.

Undergrazing can lead to the vegetation becoming overly mature, which can lead to it being less palatable and nutritious. Another challenge with horses being spot grazers is that these areas can become infested with parasites from the horse manure. Weanlings and yearlings are the most susceptible to parasite problems.

Developing a rotational grazing program is one method that can be used to help minimize overgrazing and parasite problems. A rotational grazing program allows horses to graze in one paddock for a period, usually 3 to 7 days, before being moved to another paddock for grazing. The paddock is allowed a regrowth and recovery period before being grazed again. The rest period depends on stocking rate, type of grass and legume, rainfall and temperature, and soil conditions. The typical rest period for a pasture rotation is about 18 to 30 days. The result is typically higher forage yields. Figure 4-2 shows a sample layout with multiple paddocks. A pasture management specialist can assist in developing a rotational grazing program.

Grazing horses with more efficient grazers such as cattle or sheep has been used to combat undergrazing problems. This approach helps makes use of a feed that otherwise would be wasted. In a rotational grazing program, cattle or sheep can be brought into a paddock after horses are removed so that tall pasture grasses can be eaten. If tall pasture grasses are not eaten, the pastures need to be moved two or three times per season or after horses are removed from a paddock so the pasture can grow uniformly.

Drag a chain harrow, Figure 4-3, through the pasture a few times each season or after each paddock rotation to break up manure accumulations and to open hard spots on the ground surface. This procedure will help in parasite control by drying the parasite eggs,

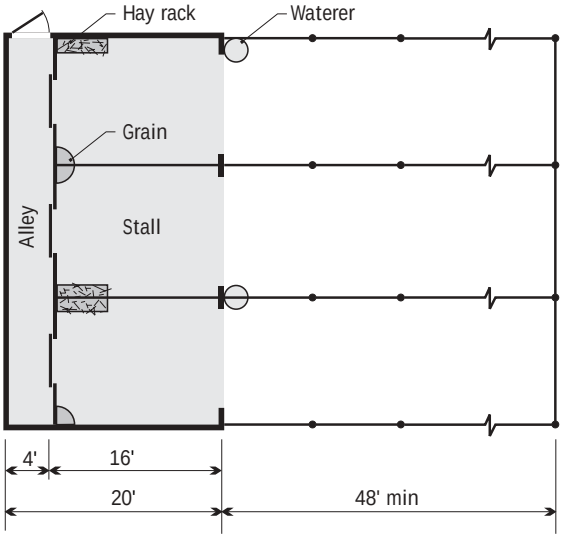


Figure 4-2 Sample open-front shed layout with grazing paddocks.

Figure 4-3 Drag chain harrow.

but this also increases the infected area if horses continue to graze the area. Deeper harrowing can help provide some aeration to roots. Note that if cattle are pastured with horses or immediately following horse grazing, transfer of parasites between species is not a concern. The parasites that affect horses do not affect cattle and vice versa.

Horses can physically damage a pasture much more than cattle. Horses run more and change directions while running much more than cattle. If possible, keep horses off pasture during periods of wet weather or when the ground is extremely wet; otherwise, they will tend to tear up and severely damage a pasture.

A good management tool for horse facilities on limited acreage is to provide at least one rainy day paddock for foul weather turnout. The principle is to allow one paddock to take the worst wear during unfavorable weather conditions while attempting to preserve the grassy integrity of the remaining paddocks. The unfortunate paddock will not be expected to maintain grass. Because turf is easily destroyed during wet conditions, the rainy day paddock can take the abuse that would ruin grassed turnouts. This paddock is to be used for those horses that have to be turned out of their stalls despite the weather. The rainy day paddock can have a sand, stone dust, or wood fiber surface added to make it less muddy. This paddock should have safe and sturdy fencing and be located in an area accessible to the stable yet away from the main public viewing areas of the stable.

Pens

All horses need regular exercise to be healthy. When space is limited on a site, an exercise pen may be the only option for a horse owner. Exercise pens are also good to have during times that pastures or paddocks are too wet for horses to be in. A general rule of thumb for an exercise area is to provide at least 1,000 square feet per horse (e.g. 12- x 80-foot pen). A 10-stall barn would need roughly one-quarter acre of exercise area adjacent to the barn for intermittent exercise of the horses.

Similar to pastures and paddocks, pens should be configured to avoid right angles and areas in which a less dominant horse can be trapped or cornered by a more aggressive horse. Sod cover is preferable, but many pens are unvegetated. These lots need to be designed to promote good drainage from the lot and managed to reduce dust. Periodic removal of manure will be necessary to keep odors to a minimum and to discourage muck formation.

Free-Choice Shelter

Horses that are kept outside and do not have access to a stable need to be provided free-choice shelter.

Buildings and windbreaks are the most common types of free-choice shelters. Constructed sunshades are common with cattle but are less popular with horses. Natural barriers as the main means to protect horses should be avoided when at all possible because of their potential to create dangerous situations for the horse. For example, many times trees are susceptible to lightning strikes, which can lead to severely injuring or killing the horse. If trees are used as a windbreak, install a fence to keep horses out of the windbreak. Rock features such as caves and overhangs can actually put a horse in danger in the event rocks should fall or a horse should stumble and break a leg.

Buildings, sunshades, and windbreak fences must be constructed to prevent injury to horses. Properly cover corners, nails, metal, fences, and any other sharp objects to protect horses from injury.

The best options for free-choice shelter are:

- Buildings (Permanent or portable open-front sheds, building lean-to).
- Sunshades.
- Windbreak fences.

Buildings

The main types of buildings used for protection are open-front buildings and lean-to structures. Open-front sheds are the most common type of housing for horses kept outside. Open-front barns typically have no solid partitions and are located to allow access to an open pasture for groups of horses.

Open front buildings can be either permanent or portable sheds. The permanent shed is the most common type of structure, Figure 4-4. Permanent structures typically have a fence attached to them. Portable structures are smaller than permanent structures and usually are located away from the fences of pastures, paddocks, or pens, Figure 4-5. As the name suggests, these structures can be moved to facilitate removal of manure or to make efficient use of a structure as pastures or paddocks are being rotated.

Figure 4-5 Portable shed.

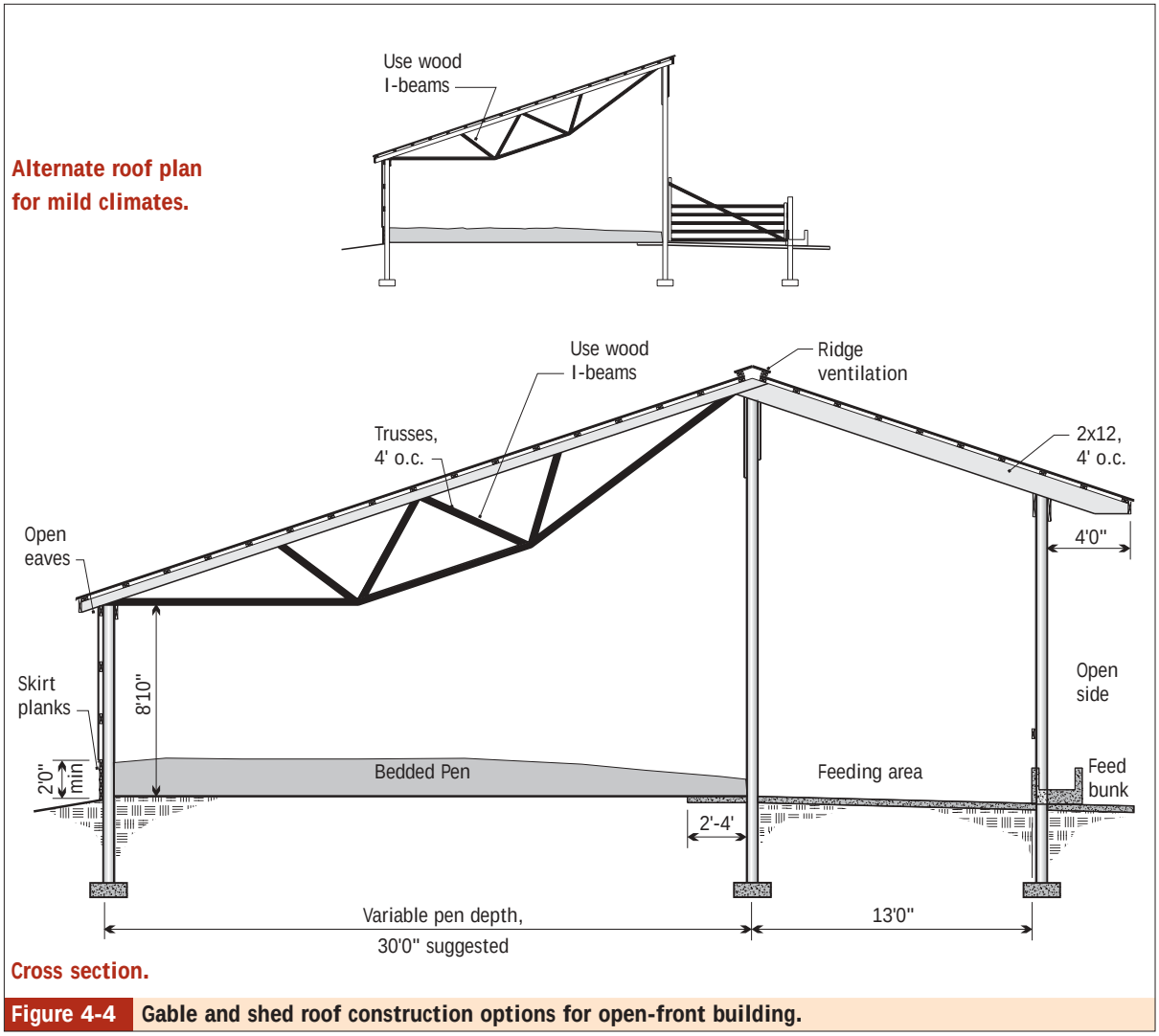
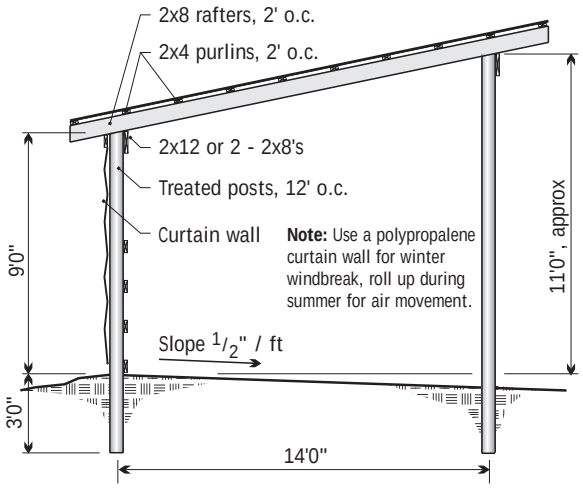


Figure 4-4 Gable and shed roof construction options for open-front building.

Design open-front barns to break the wind and provide shelter from rain and snow, while allowing free access by the horse. Face the open side of the building away from the prevailing winds, with the remaining three sides closed. Preferably, the structure will include the provision to open sidewalls for summer ventilation, Figure 4-6. The minimum clearance from the ground to the eave on the open side is 10 feet.

Depending upon the type of construction, the barn may be 14 to 40 feet wide. Open barns wider than 40 feet often do not ventilate well naturally. Depending on the number of horses, supply one or more single-slope shed barn or, for large groups of horses, a barn that is 32 feet wide (40 feet wide in cold climates) may be used. Provide a minimum of 80 square feet of floor space per 1,000 pounds of horse weight using the shelter. Preferred minimum areas are



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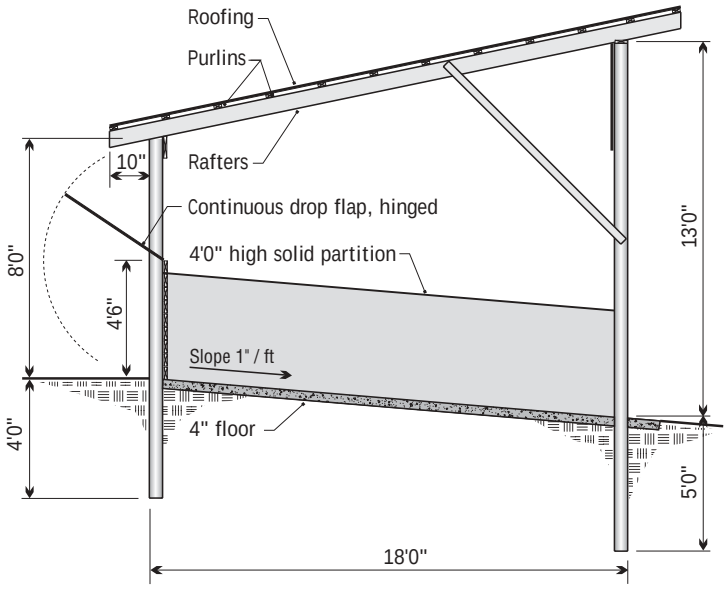

Cross section.

Figure 4-6 **Shed roof construction options for open-front building.**

given in Table 4-1. Provide at least 10 feet clear height to the eave on the open side, Figure 4-7. Some additional space may be allowed in the barn for pens, foal creep areas, a tack room, or for limited storage of hay and bedding. For fire safety and better ventilation, store most of the hay and bedding in a separate barn or building. See *Chapter 7, Environmental Control.*

When selecting a site for the shelter, consider its location in relation to other buildings and traffic lanes. Proper building location will make it more convenient to handle horses. Some artificial light is desirable in non-portable structures. Provide 100 watts of light

Table 4-1 **Recommended roofed area for open-front horse housing.**

Animal type	Covered area (sq ft/animal)
Foals	100
Yearlings	120
Mature horses	150

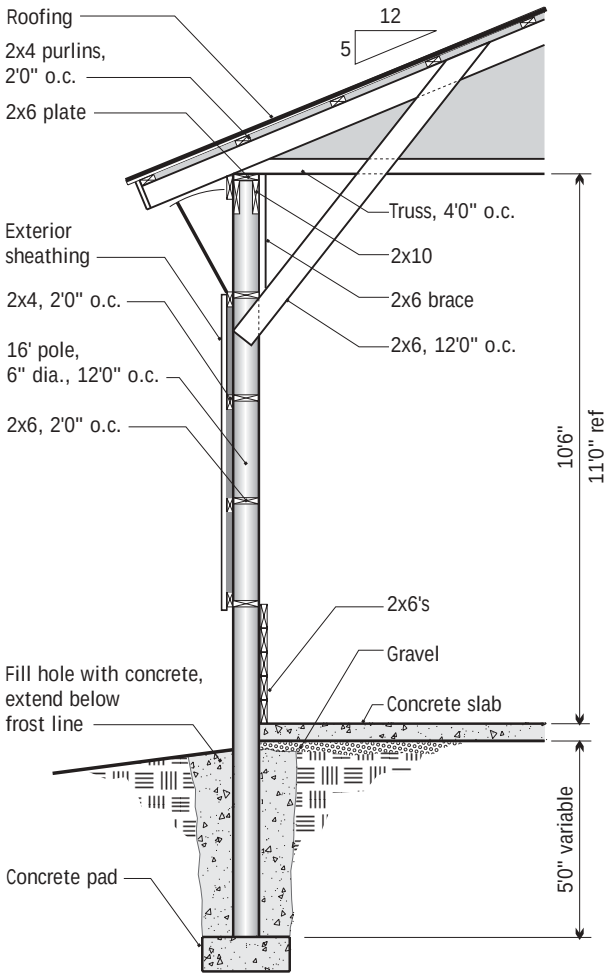

Figure 4-7 **Removable exterior sheathing.**