

# Feedlot Layouts

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## Take Home Message

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- ✓ The overall layout of a feedlot will depend on site selection, expansion plans, and the choice of feeding, watering, cattle moving and waste handling systems. The slope of the site is the main factor affecting drainage patterns and therefore pen locations relative to feeding alleys and pen drains.
- ✓ Most feedlots follow a rectangular layout with multiple feeding pens. They are easy to expand; however, extensive earthwork is often required to ensure clean pens with good drainage. If the feedlot is well designed, movement of cattle, feed, and waste will be efficient and allow for maximum production.

## Types of Feedlots

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The basic rectangular feeding pen has a feed bunk along the top and a drainage channel at the bottom. They are arranged in a straight line to make feeding easy. This repeating rectangular block layout has two variations, one for a flat site and one for a sloping site (**Figure 1**).

A less common layout is a pie-shaped lot. The drainage, feeding and expansion possibilities are more limited.

### Flat site, block layout

This is the most common design for large, commercial operations (Figures **1A** and **2**). Construction is relatively simple and it provides for very efficient feeding, cattle handling, and waste handling patterns. The watering system installation is simple and the lot is easily expandible. These lots are usually built on flat or gently sloping sites. This layout requires preliminary earthwork to ensure proper pen and lot drainage.

- Most common layout
- Good feed handling, traffic, cattle flow
- Easy to provide water and services
- Easy to expand
- Requires pre-construction earthwork to establish grades and drainage.

## Sloped site, contour layout

For lots on long sloping sites, generally smaller lots, a contour or strip layout is possible (Figures **1B** and **3**). The pens follow the contour of the hill so that the feeding alleys are level. The amount of preliminary earthwork depends on the existing topography. The site of a particular sloped site may limit expansion possibilities.

- Takes advantage of natural topography.
- Usually excellent for drainage.
- Good feeding and waste handling.
- Can get 'strung out' and limit expansion.

## Pie- shaped lots

This style of feedlot (**Figure 4**) is compact and is ideal for a knoll building site. It can easily accommodate mechanical feeding from a central silo feeding system.

If feeding is done along the outside perimeter, the pens must be landscaped to ensure drainage along every second fence line, then under the feed alley. Cattle handling can be centralized. To expand, another pie-shaped lot must be built.

- Compact design, well suited to knoll.
- Cattle handling centralized and efficient.
- Can be used with central mechanical feeding.
- Drainage is a challenge with perimeter feed bunks.
- Cannot be expanded unless a new lot is built.

## Design Principles

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The component systems that go into a feedlot layout design are:

- Feeding system.
- Water system.
- Waste handling and drainage.
- Cattle handling.
- Hospital area..
- Staff area.

General design principles are:

1. To maintain clean, dry pens survey the site and do the earthwork to obtain a uniform 2 - 4% pen slope.
2. Locate feeding pen runoff drains outside of the feeding pens. This makes the best use of pen area. Two options are to have a combined cattle handling alley and drain or to have separate alleys and runoff drains.
3. Design the runoff drainage system not to interfere with feeding roadways.

4. Minimize interference between cattle handling alleys and feeding roadways. Feed trucks that have to wait for cattle to cross a roadway are not as efficient.
5. Design all cattle alleys, feeding roadways, gates, and pen runoff drains so that flow is not restricted.
6. Minimize travel distance for cattle, feed trucks and manure equipment, 25% less travel may reduce annual operating costs 6 - 10%.
7. A single vehicle entry past an office and scale can improve security.
8. Take care to engineer high quality road bases, good quality feed bunks and pads, and proper water system installation.

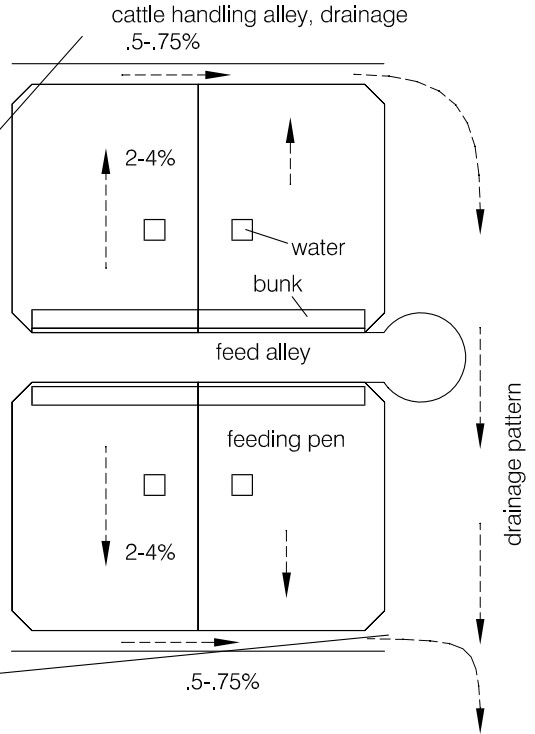
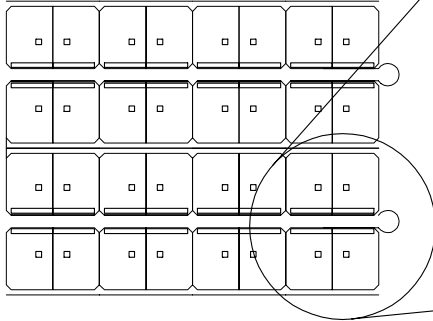
Table 1. General Guidelines, Feedlot Planning.

Land required (pens, alleys, service areas)	1 acre/125 head
Water usage (600-1000 lb cattle)	8 gallons/day (Imp) average (up to 18 gal peak usage)
Manure production (Code of Practice)	13.1 lb/day - unpaved lots 19.8 lb/day - paved lots

Figure 1. Principle Feedlot Types.

### A - Flat Site, Block Layout

- efficient feeding, cattle handling, waste handling patterns
- easily expanded
- requires earthwork to ensure proper drainage



### B - Sloped Site, Linear or Contour Layout

- suitable for long sloping sites.
- may not require preliminary earthwork
- more limited for expansion

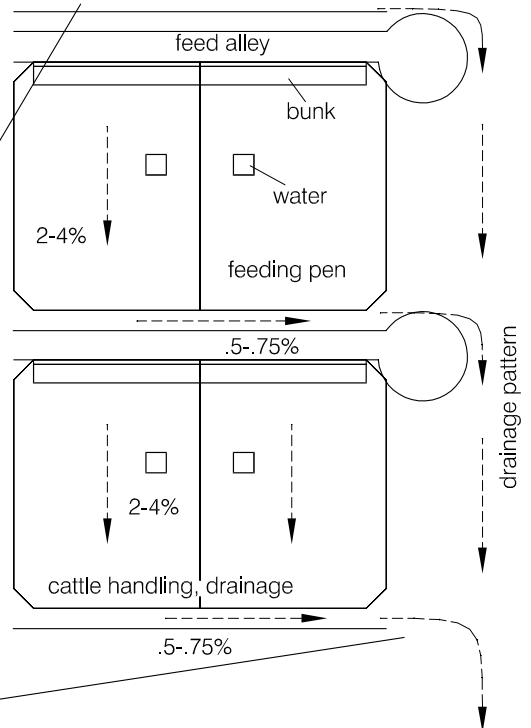
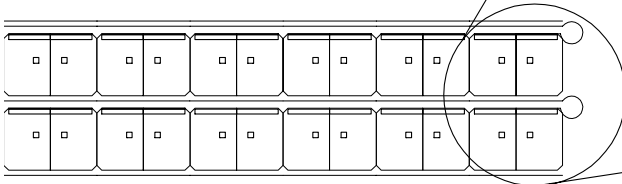


Figure 2. Flat Site, Block Layout Lot.

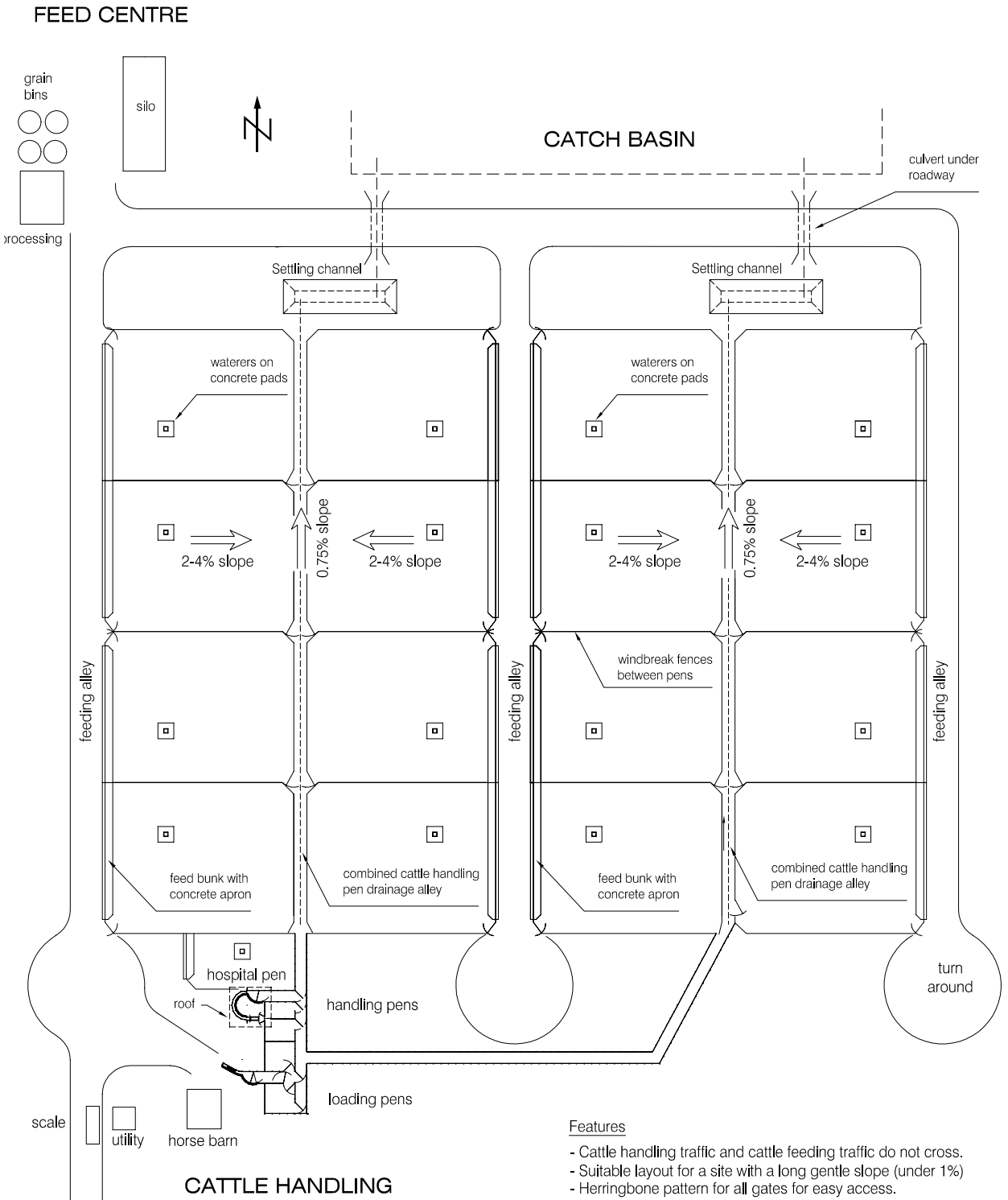


Figure 3. Contour Lot.

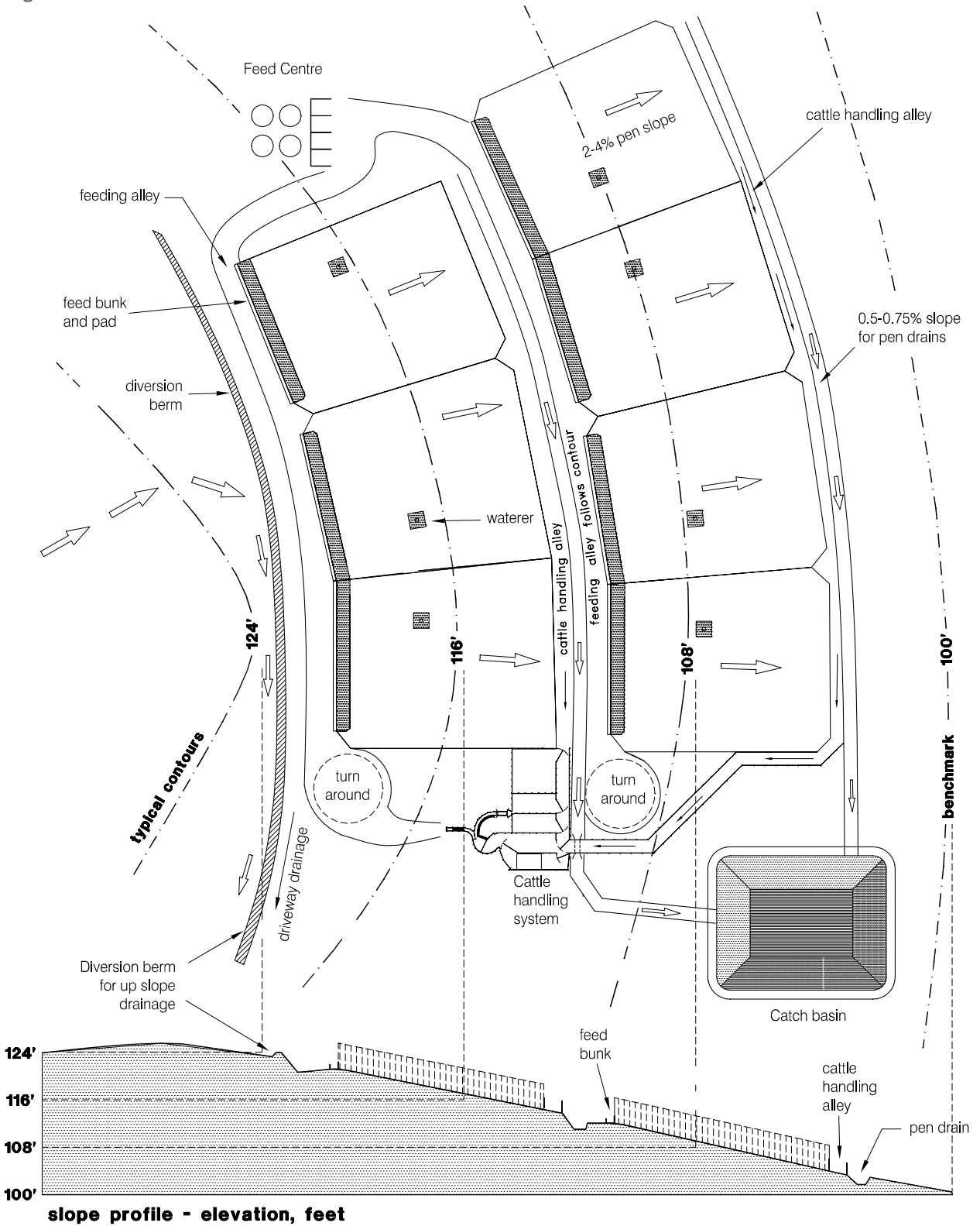
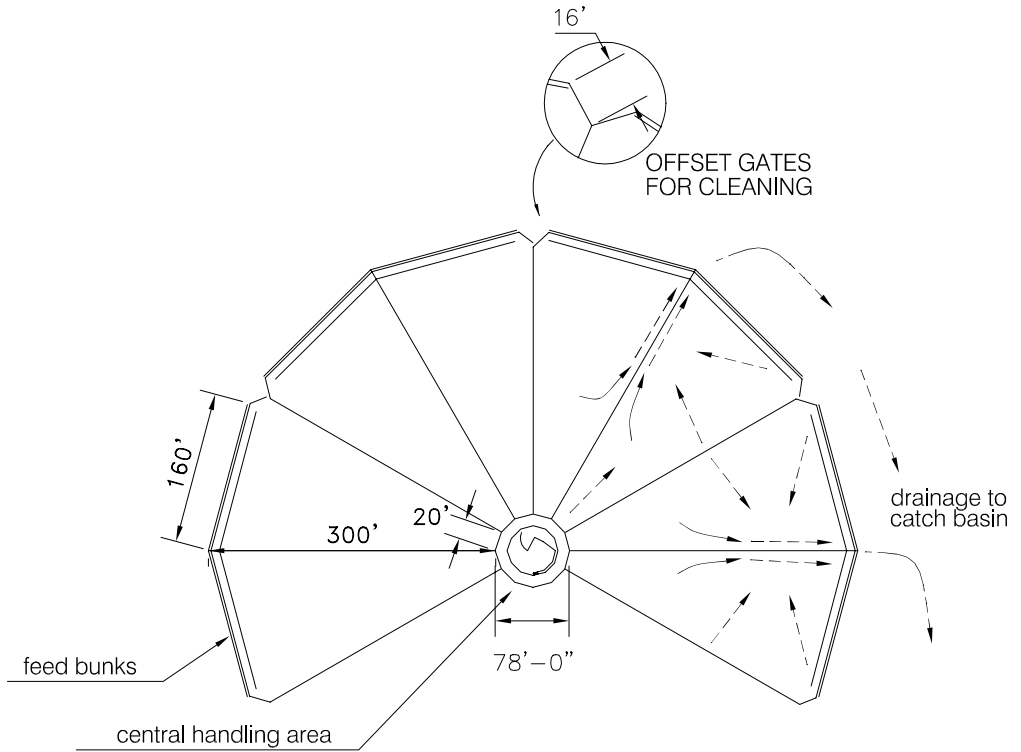


Figure 4. Alternate Pie Shaped Lots.



- easy animal movement to the centre for treatment.

- drainage is a challenge. Build on a knoll to keep the centre dry. For feed bunks on the outside perimeter, drainage will be along the fences.

