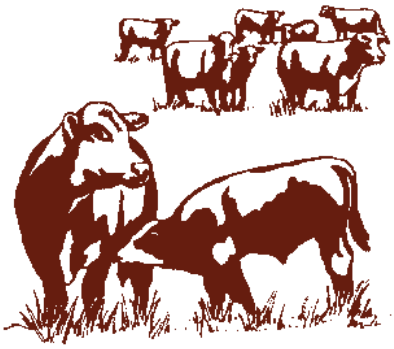

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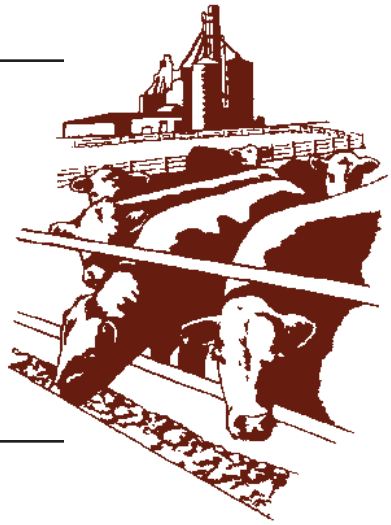

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Fence Line Feedbunk Design

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The fence line feedbunk is the typical feeder of cattle feedlots in the Great Plains Region. This type of feeder works well with the mechanical feed wagon delivery system. Experience has shown the shape, size, construction, location and orientation of these feedbunks can affect feed losses, ease of feed distribution and feedbunk cleaning, feeding system maintenance, feedlot rodent control and feedlot fly control. All of these factors can have an eco- nomic impact on a feedlot operation. This fact sheet pres- ents fence line feedbunk design and construction information as it relates to the open feedlot application of this type feeder.

Location and Orientation

A key consideration in feedbunk location is drainage. Place feedbUnks so feedlot or adjacent area runoff water drains away from feeder. Grade and shape the area if necessary to secure good drainage. A 2% slope away from the feedbunk on both the lot and road side of the feedbunk is minimum. Slopes of up to 8% are commonly used. Slopes over 8% may create erosion and maintenance problems. (See Figure 1.) When feeding is from only one side of the feeding road, placing feeders along the high side of the pens will usually minimize earth shaping work to secure drainage. When it is desirable to feed along both sides of a feeding road, running the fence line feeders perpendicular to the land contour (up or down the slope) usually minimizes earth shaping requirements. The maximum desirable grade on feeding roads running with the slope of the land is around 8%. Lot cross slope drainage, roadway maintenance due to erosion, and occasionally mud or ice can be a problem on steeper slopes.

Orientation or lengthwise direction of a feeding bunk is another item to consider when locating bunks. Drifting snow, frozen manure pack build-up, wind blown feed losses, and rate of drying after a wet period are some of the factors affected by feedbunk orientation. The importance of these factors varies some with your location in the Great Plains region. In colder areas of the region where drifting snow and frozen manure pack

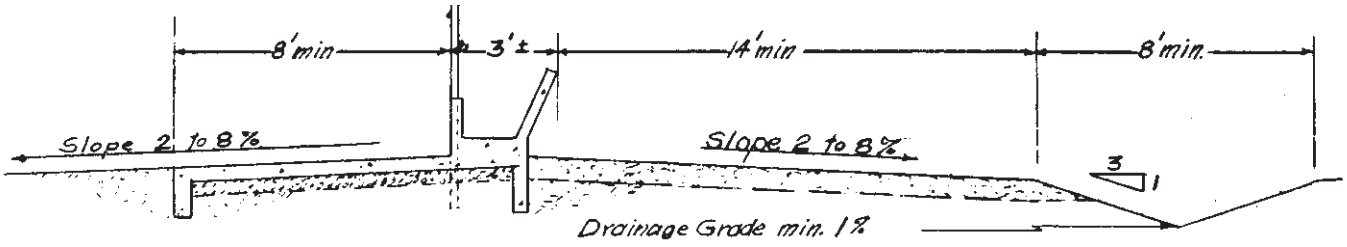

Figure 1. Feedbunk Grade and Drainage Section

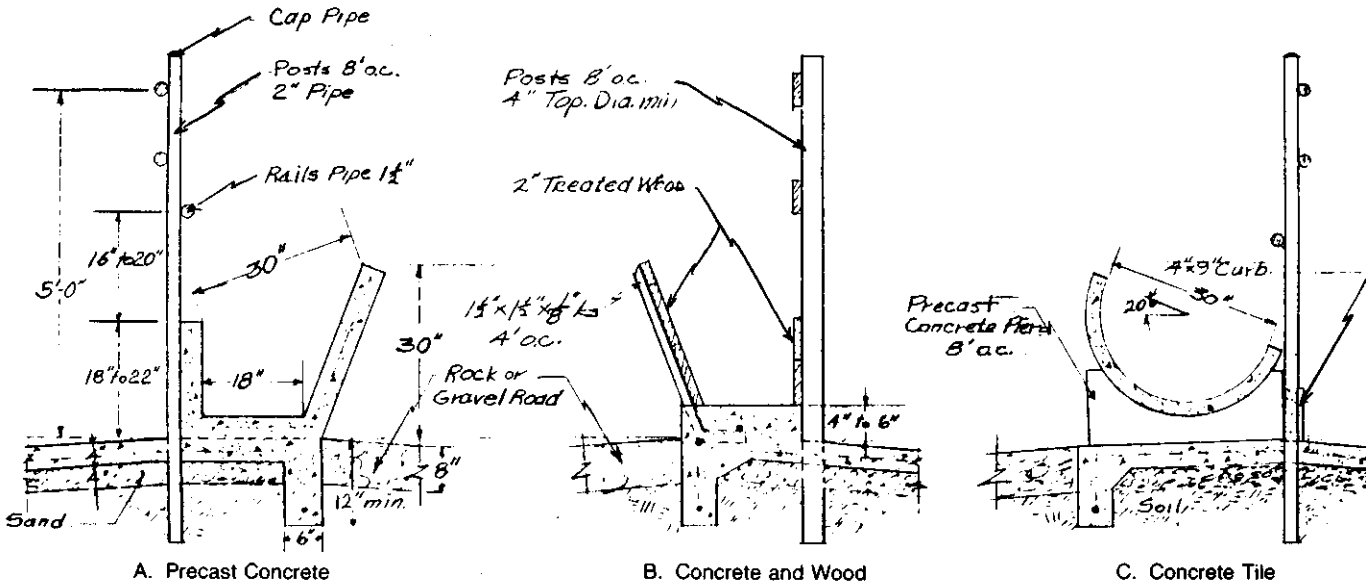

Figure 2. Typical Fenceline Feedbunk Sections.

build-up is a greater prob- lem, feedlot sites with south or southeasterly slopes are generally preferred. With the possible exception of wind blown feed losses, orienting bunks with a N-S or near N-S length-wise direction is preferred. Snow drifting from pre- vailing northerly winds is minimized and sun shining on the feeding floors at least 1/2 of each day aids in drying the area and minimizes frozen manure pack problems. E-W bunk orientation are best adapted to southern areas of the region or sites with natural or tree-belt windbreak protec- tion to the north.

Space and Capacity

Feeding space and bunk capacity is a function of animal size, feed ration, and feeding time interval. Feed- bunk space requirements for feeding programs where all animals need to eat at once such as limited grain feeding on a once a day schedule are:

18" to 24" calves up to 600#
24" to 26" calves 600# to market
26" to 30" mature cows and bulls

For these feeding systems, a bunk capacity of 1-1/2 to 2-1/2 cu. ft. per foot of bunk length is needed. A recent survey of over 60 Texas feedlots sponsored by the Texas Cattle Feeders Association report over 90% of the feeders feed two or more times per day. Bunk space requirements of 600 pound to market weight cattle on finishing rations fed twice daily or more ranges from 9 to 12 inches of bunk length per head. A bunk capacity of 1 to 1-1/2 cu. ft. per foot of bunk length is adequate for this kind of the feeding program.

Feedbunk Design

Factors to consider in feedbunk design and selection include:

- Durability and maintenance
- Ease of filling _ Ease of cleaning
- Feed loss characteristics

Concrete is the building materials most commonly used in feedbunk construction. Other suitable materials include wood and metal or some combination of these materials. Concrete used for feeding bunks should be a high quality concrete to resist the corrosive effect of salts and minerals in the feeds. A mix of 7 sacks of air entrained cement per cu. yd. of cement with not over 5 gallons total water per sack of cement is recommended.

Sealing the concrete with a water seal, boiled linseed oil treatment, or epoxy resin paint prior to use will in- crease the life of the concrete and reduce erosion of the bunk floor. Lumber used for outside feeding bunk con- struction should be pressure, preservative treated. Rec- ommended treatments include creosote, 10 pcf (pounds per cubic foot); penta, 0.50 pcf; ACA or CCA (Type A or B) salts 0.40 pcf. A short weathering period or wash down of freshly preserved timber may be desirable prior to use.

Typical Feeding Bunk Cross-Section Dimensions: (Figure 2)	
Throat Height:	18" to 22"
Feedbunk Bottom Width:	16" to 18"
Bunk Floor Height Above Slab:	4" to 12"
Neck Rail Height Clearance:	16" to 20"
Adjustable Feed Road Bunk Wall Height Above Feed Road	30"
Width of Feed Delivery Top Opening	30"

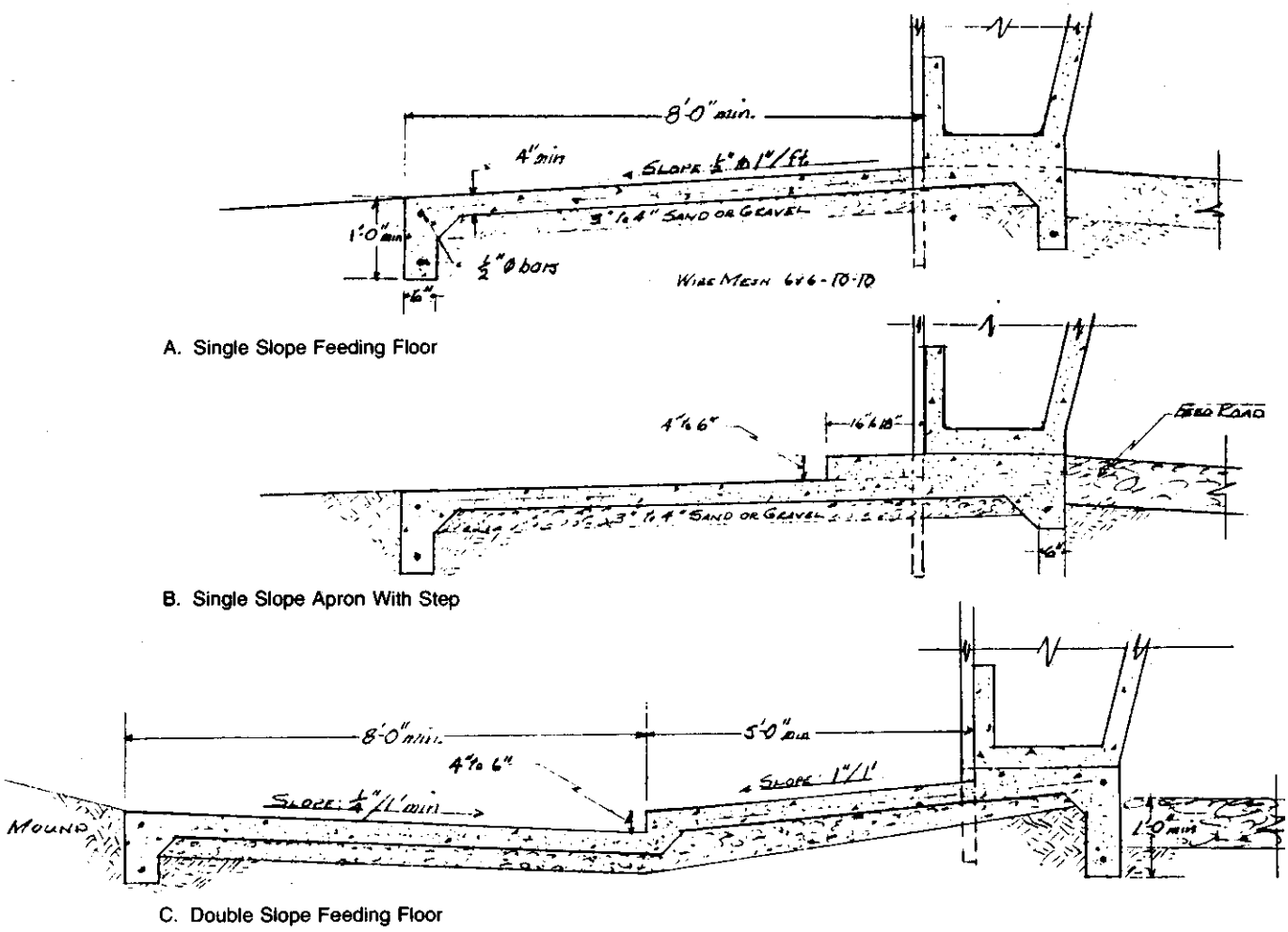

Figure 3. Typical Feeding Floor Sections

A feedbunk drain for rainwater discharge is needed for each lot or 100 to 150 lineal feet of fence line bunk. Drains should be at least 1-1/2 inches in diameter to minimize plugging problems. Discharging the bunk drains on to the feedbunk apron is the preferred discharge location. Bunk cleaning is easier when the feeding fence posts are in or on the lot side of the bunk not in the feedbunk floor. (Figure 2). Rounding sharp corners within the feeding bunk bottom will make cleaning easier and reduce the problem of feed lodging in these areas and becoming stale or sour. Increasing the slope of the feed- bunk apron to 8% or inserting a step along the bunk (Figure 3) reduces in bunk manure problems. When one considers the fact 64% of the feeders surveyed in the Texas study clean their feed bunks at least weekly and 81% report at least partial manual labor cleaning the value of easy to clean bunks and designs which reduce the need for cleaning becomes obvious.

Rodent, fly and odor problems associated with feedlot operations are often magnified by poor feedbunk base design or construction. If possible, eliminate open areas under the bunks where manure, spilled feed and similar trash can collect. Make sure the concrete at the edge of a concrete feeding apron or feedbunk foundation are at least 12" deep. This will keep rodents from burrowing under the slabs and establishing a "safe haven" next door to a plentiful supply of feed and water. The feedbunk base construction designs (Figure 2) minimizes bunk rodent and fly problems. They will also aid in odor control and reduce the clean-up and maintenance labor requirements. The neck rail on the feedbunk fence provides easy access to feed and keeps cattle out of the bunk and in the pen. To accommodate varying sizes of cattle neck rails with a 16" to 20" adjustable opening between the bunk throat height and the neck rail will accommodate cattle from around 500# to market weight. To reduce pressures on the neck rail from cattle leaning against it as they reach for feed in the bunks neck rails are often supported by small brackets attached to the posts which set the rail 3" to 4" in from the fence line over the feeding bunk. To complete the feedbunk fence, one or two rails are placed above the neck rail with the top rail located ap- proximately 5 ft. above the feeding apron level. Support posts for the feedbunk fence are spaced approximately 8' on center. Two inch pipe posts 8 ft. long or pressure treated wood posts 4" minimum top diameter are recommended.

Feeding Floor Design

Feeding floors or feedbunk aprons are essential to fenceline feedbunk feeding systems. Concrete is the most satisfactory feeding floor material. When properly placed, a concrete feeding floor should provide the owner at least 20 years of dependable service with very little maintenance.To get this kind of a feeding floor, the builder must:

1) Prepare the site properly for concrete placement.
2) Use quality concrete, reinforced as specified.
3) Place, finish and cure the concrete properly.

Site preparation for feeding floors involves. Cleaning or clearing the surface of any organic or unstable mate- rials. Shaping the surface to the desired grade and thoroughly compacting fill areas. Fills of over 12" depth should be compacted in layers. Feeding floors over poorly drained or heavy clay soils should have a 4" to 6" sand or gravel bed. A recommended concrete mix for feeding floors is use at least 6 sacks of cement per cu. yd. of concrete and not over 6 gal. total water per sack of cement. Use air en- trained cement. When ordering ready mix, specify a 6 sack mix with a maximum slump of 2" in lieu of the 6 gallons of water limitation. When mixed on-the-job, (1) be sure all ingredients go through the mixer, avoid adding field stones and old scrap iron; (2) use only clean aggre- gate; (3) the water used should be clean enough to drink; (4) aggregate size should not exceed 1/4 the floor thickness.

To prepare for concrete placement prior to concrete delivery: (1) Place and level the 4" to 6" sand or gravel slab base. (2) Set brace and stake forms to the design finish grade. (3) Place and tie or support reinforcing steel at the specified location in the slab and footings. (4) Sprinkle or moisten the sand or gravel base material until thoroughly compacted.

When the concrete arrives: (1) Spread, level and vibrate or spade the concrete into the forms to insure complete filling, (2) Strike or level the concrete surface off at the proper grade. (3) Finish the surface to the desired texture. (4) Be prepared to protect and cure the finished concrete for at least 6 days after placement. The texture preferred for feeding floors is a rough nonskid surface. A wood float or broom will usually provide the finish wanted. If concrete is placed during freezing weather, take special care to protect it from freezing for at least 24 hours. During "Hot weather" take special care to keep the surface moist for at least 24 hours after placement. Typical feeding floor sections are illustrated in Fig- ure 3. Section (1 and 2) fit locations where lot drainage is away from the feeding bunk. Section 3 illustrates a double slope feeding floor design. This is a good option for feed lot sites with little natural drainage or lots where natural lot drainage may be toward the feedbunk. One advantage of this design is it eliminates the deep mud area that com- monly develops at the end of a feeding floor. The step along the bunk (section 2) is optional for any feeding floor. Its purpose is to reduce animal defecation into the bunks. The step is most effective for feeding floors with slopes of less than 1/2" per foot.

Feeding Roads

A stabilized all-weather road capable of supporting feeding trucks is needed to service the fenceline feedbunk. Commonly used feed road surfacing materials include crushed rock, gravel and sand. The local county engineer or road department is a good resource to consult to locate the best local road surfacing materials. Road materials vary widely over the region. The feed road surface should be at least 14 ft. wide and shaped to drain with a minimum slope of 2% away from the feedbunk. A 6 to 8 inch thick rock or gravel base with a 1" to 2" surface covering of finer material such as chat or sand is generally adequate for road surfacing on well drained soils. A 12" thick base may be needed on poorly drained soils to get the needed stability. A road shaping program that maintains good road surface drainage at all times will minimize road repair and reconstruction costs.

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