



Adolescent Heifer Housing - 3rd in a Series
*Proper housing for the adolescent management group is crucial
to rounding out your replacement rearing facilities*

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Once calves reach 5 to 6 months of age, they are ready to graduate from the transition management group and move on to the adolescent management group. Adolescent management group calves range in age from about 6 months to pre-calving (400 to 1,200 lbs.). Their needs are slightly different than those of transition calves. They need to become accustomed to larger animal groups, resulting in increased competition for feed, water, and choice resting space. This limited competition will help prepare adolescent heifers for the atmosphere they will face when they enter the lactating herd. Also, they are entering into the stage of life when initial breeding will take place.

This article is the third in a series on housing replacements and focuses on the adolescent management group.

Adolescent Submanagement Groups

Unlike the newborn and transitional management groups, the adolescent management group lends itself well to distinctive submanagement groups. Based on body weight and status (i.e., breeding age and confirmed), adolescent heifers can be placed into one of four submanagement groups (A, B, C, or D). Grouping in this manner allows heifers to maximize facility attributes like feeding and resting areas, and allows the producer to further improve labor efficiency over that realized with newborn and transitional housing systems. Approximate body weights for submanagement groups A through D are 400 to 600, 601 to 800, 801 to 1,000 and 1,001 to 1,200 lbs., respectively.

Attributes of Adolescent Housing

A good dairy housing facility meets three basic needs: a clean, dry, comfortable resting area, adequate ventilation, and easy access to feed and water. The adolescent management group also needs a means for restraint to facilitate health checks and possibly AI service. Hoof care needs to be accomplished easily so it is done when required.

Housing Options

Four primary housing options exist for housing post-transitional heifers: gated bedded pack shelter, gated freestall shelter, gated counter-slope shelter, and gated mono-slope shelter. All of these options are cold, naturally ventilated barns that can provide an excellent environment from an air quality standpoint if they are properly designed and positioned with the shelter's sidewall perpendicular to the prevailing summer winds.



We will discuss the gated bedded pack and gated freestall shelter options in this paper. The counter-slope and mono-slope shelters use no bedding and rely on a steeply sloped resting floor surface in combination with heifer foot traffic to transfer deposited manure to a scrape alley. Experience has shown that the overall cleanliness and ability of heifers to handle cold stress is sometimes compromised with these facilities due to the matted hair coat which exists as a result of lying in manure.

Determining the Size of an Adolescent Group Housing Structure

The size of a housing structure is important. A facility that is too small will not provide adequate space for each heifer, while one that is too large results in unnecessary capital costs. A facility is properly sized by first determining the number of heifers in each submanagement group and then calculating the total area or number of stalls required to properly house them.

Deciding the number of heifers that are needed on the farm is based on the one of three primary goals: 1) to maintain a given cow herd size, 2) to increase a given cow herd size, or 3) to decrease a given cow herd size. Variables that need to be considered include: 1) cull rate of cow herd, 2) cull rate of replacement herd, and 3) the age of first calving.

The gated bedded pack shelter (Figure 2), gated two row freestall shelter (Figure 5), and combination gated bedded pack/freestall shelter (Figure 9) are all designed for post-transitional replacements required to maintain a 100 cow herd with a 30% cull rate of mature animals, 10% cull rate of replacements, and a 24 month age of first calving. Shelter sizes for herds of other than 100 cows can easily be determined by using ratios. The gated three row freestall shelter (Figure 7) is designed to house enough adolescent heifers to maintain a 200 cow herd, which is considered the minimum herd size for this shelter configuration. The number and distribution of adolescent management group heifers is shown in Table 1.

Table 1. Number and distribution of adolescent management group heifers⁽¹⁾.

Submanagement Group I.D.	Weight (lbs.)	Approximate number of heifers in each submanagement group	
		100 cow herd	200 cow herd
A	400-600	10	20
B	601-800	14	28
C	801-1,000	10	20
D	1,001-1,200	30	60
Total		64	128

⁽¹⁾ Based on 30% cull rate of mature animals, 10% cull rate of replacements, and a 24 month age of first calving.

Feed and Water First

To obtain high labor efficiency rates, feed needs to be delivered to heifers with ease. This overall requirement of the dairy industry has resulted in the practice of fence line feeding. To obtain optimal daily growth rates, the consumption of feed and water needs to happen without interference. Both need to happen in concert to achieve the highest level of success. The design of a fence line feeding area is shown in Figure 1, and Table 2 provides the recommended dimensions of the feeding area for each of the submanagement groups.

Gated Bedded Pack Shelters

Gated bedded pack shelters are very similar in design to transition shelters. And like transition shelters, they provide excellent comfort and animal cleanliness when properly sized and managed. A bedded area with a minimum of 30 to 35 sq. ft. per heifer for up to 15 months of age and 35 to 40 sq. ft. per heifer for greater than 15 months of age is used in conjunction with a scrapped feed alley. Proper management includes insuring that adequate bedding is provided—which has been shown costly not to purchase, but to distribute and remove from the shelter. It is not recommended to extend a transition shelter to house adolescent heifers since the most efficient building configurations are different for each management group.

Gated bedded pack shelters offer the dairy producer more management flexibility to handle abnormally high numbers of heifers in this management group (resulting from irregular calving intervals) when compared to gated freestall shelters. Gated bedded pack shelters are not limited to a certain submanagement group like freestall shelters are, due to their need to provide proper freestall design. Gated bedded pack shelters also offer more relief from concrete than gated freestall barns. A gated bedded pack shelter floor plan and cross-sectional drawing to house adolescent replacements for a 100 cow herd is shown in Figures 2 and 3.

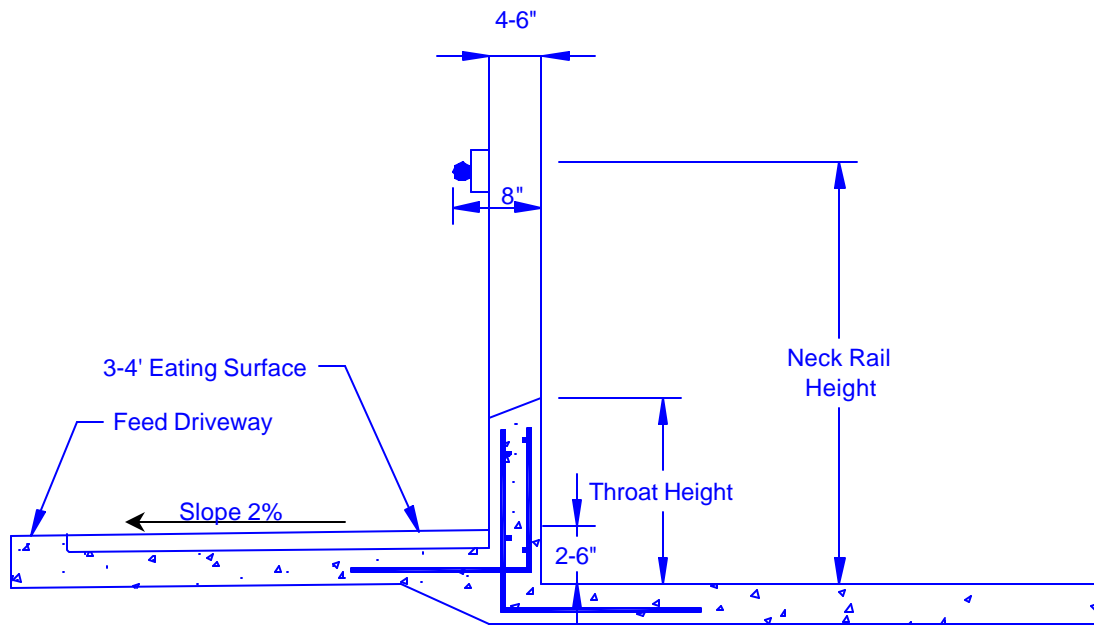


Figure 1. Post and rail fence line feeding system for heifers.

Table 2. Dimensions for post and rail fence line feeding system for heifers.

Submanagement Group I.D.	Weight (lbs.)	Minimum Feed Line Space	Maximum Throat Ht.	Neck Rail Ht.
A	400 – 600	15"	15"	29"
B	600 – 800	18"	17"	34"
C	800 – 1,000	20"	19"	41"
D	1,000 - 1,200	22"	19"	41"

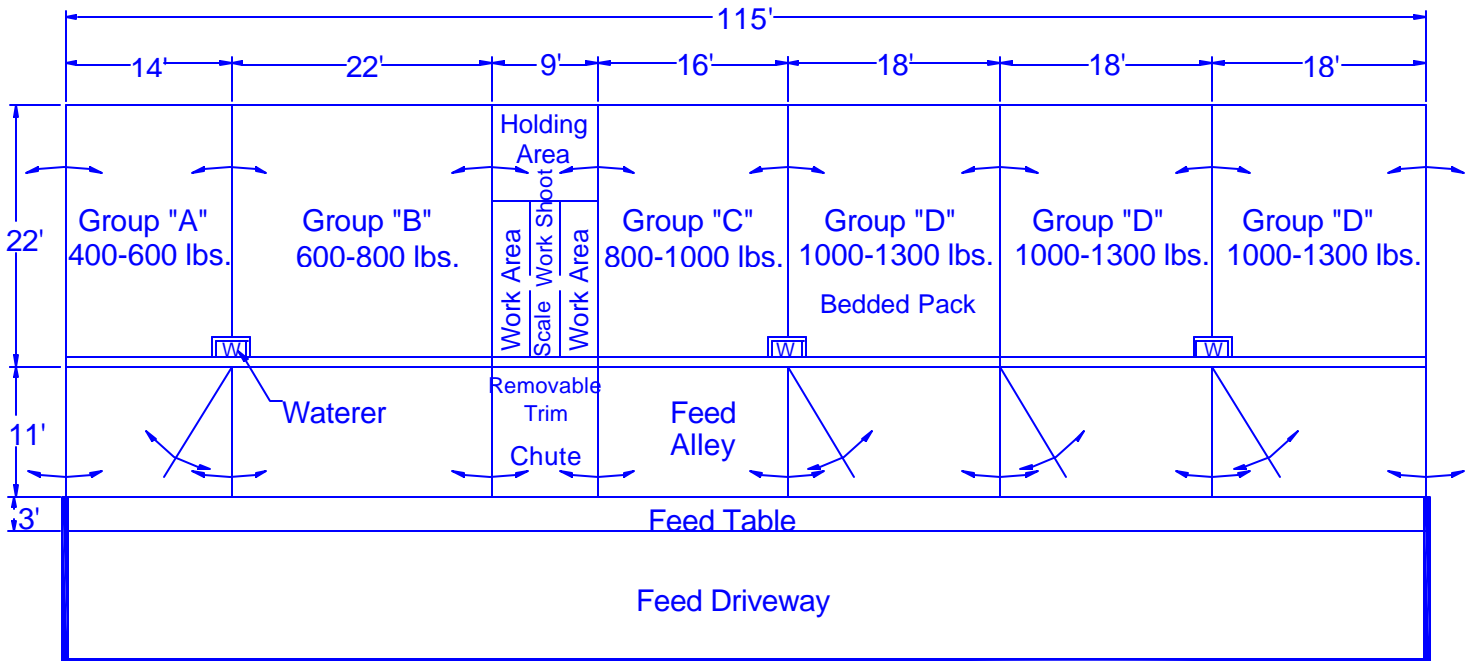


Figure 2. Gated bedded pack shelter floor plan for a 100 cow herd.

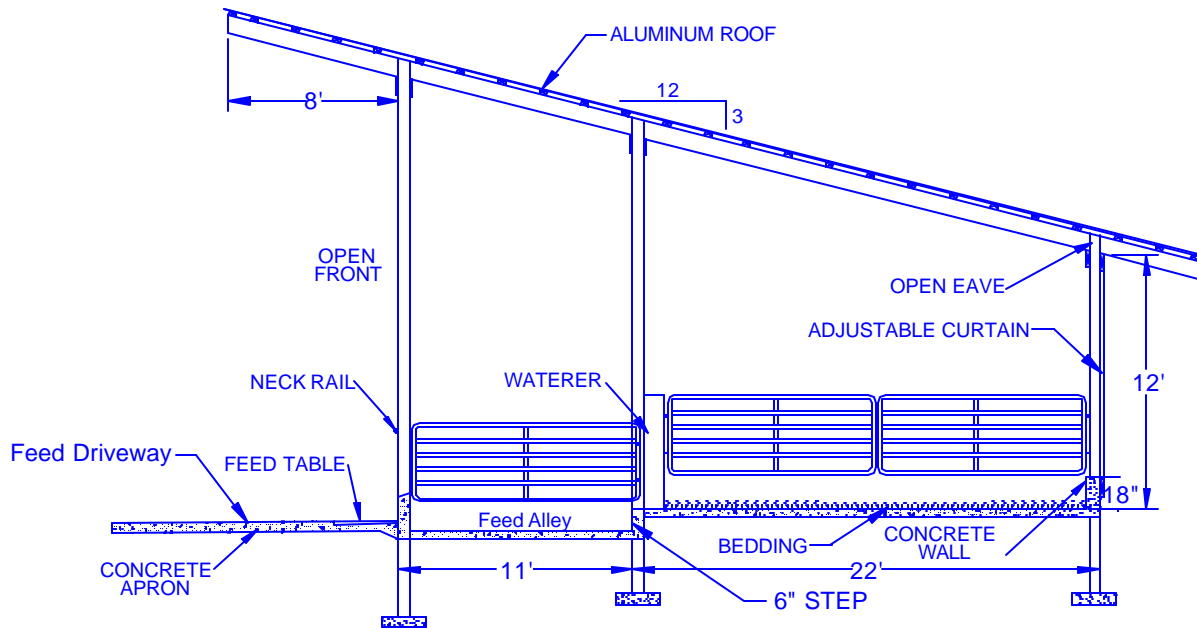


Figure 3. Gated bedded pack shelter typical cross sectional view.

Gated Freestall Shelter

Gated freestall shelters for adolescent heifers provide them with an opportunity to become "well-educated" to freestall use before becoming a milking cow, if lactating freestall housing is their final destination. Freestall shelters require far less bedding than a bedded pack shelter for an equal number of heifers. However, freestall shelters require more total area per heifer than bedded pack shelters. To house 64 heifers, a bedded pack shelter (Figure 2) would require 3,795 sq. ft. versus 4,828 sq. ft. for a freestall shelter (Figure 5).

Freestalls are not a viable option for calves less than 400 to 600 lbs. Freestalls must be properly sized for each adolescent submanagement group to ensure proper use. Stalls that are too large allow calves to lie diagonally or even backwards in the stall. Stalls that are too small can preclude heifers from using them at all. Both situations can result in unhealthy calves and the development of poor stall use habits that can cause frustration to the producer. A cross sectional drawing of a freestall designed for heifers is shown in Figure 4. Recommended freestall dimensions for each submanagement group can be found in Table 3. False fronts are used in the stalls for smaller heifers in order to keep the overall stall length consistent throughout the shelter. This keeps the shelter alley widths consistent from end to end facilitating easy manure removal.

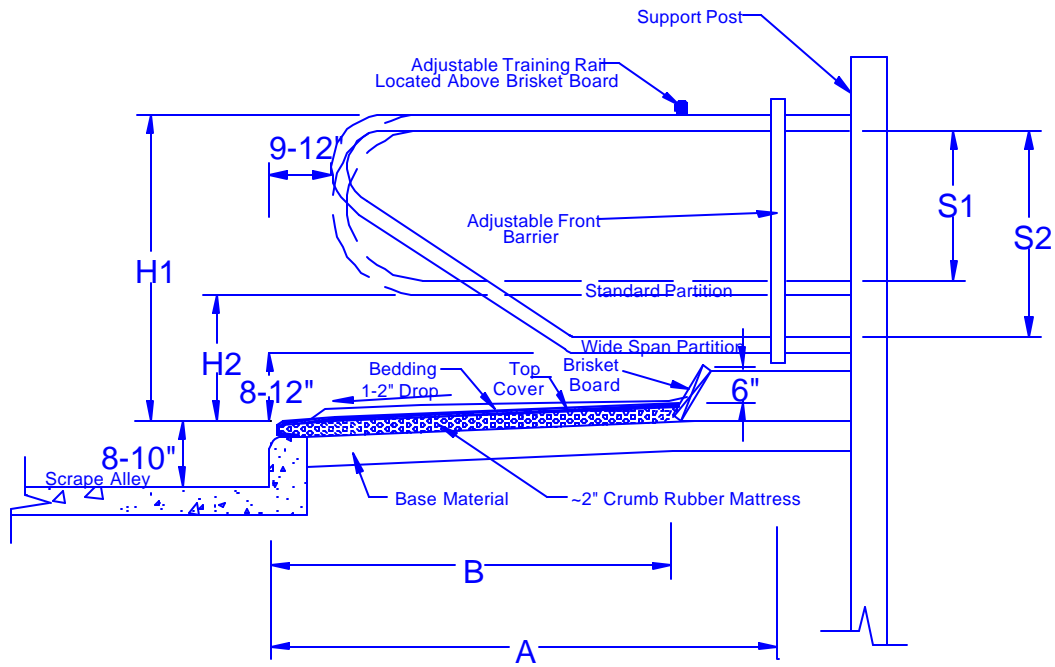


Figure 4. Freestall design for heifers using standard and wide span freestall partitions.

Table 3. Recommended dimensions for variables shown in Figure 4.

Group I.D.	Weight (lbs.)	Length (in.)		Partition Spacing (in.)	Height (in.)		Rail Spacing	
		A ⁽¹⁾	B		H1	H2	S1	S2
A	400-600	60-66	46	32	32-36	9-12	16-23	18-24
B	601-800	66-72	50	36	36-38	12-16	16-23	22-26
C	801-1,000	72-78	56	39	38-40	12-18	16-24	24-28
D	1,001-1,200	78-90	64	42-46	40-44	12-18	18-28	26-32

⁽¹⁾The largest value in the range should be used when the stall front is not open while the smallest value may be used if the stall front is open.

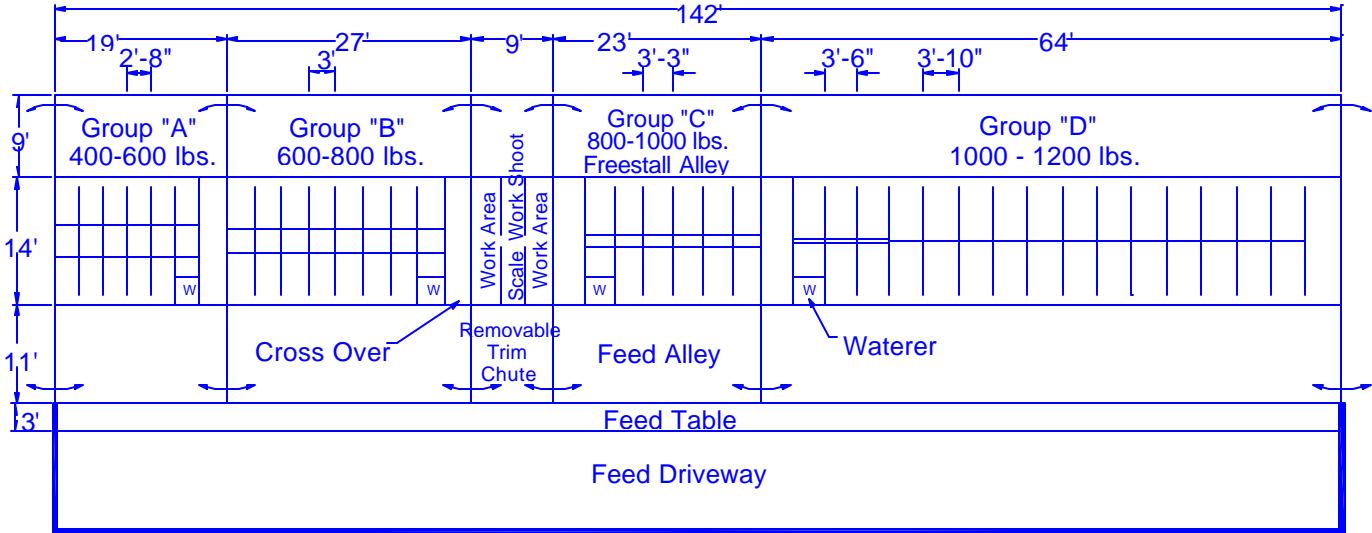


Figure 5. Gated 2 row freestall shelter floor plan for a 100 cow herd.

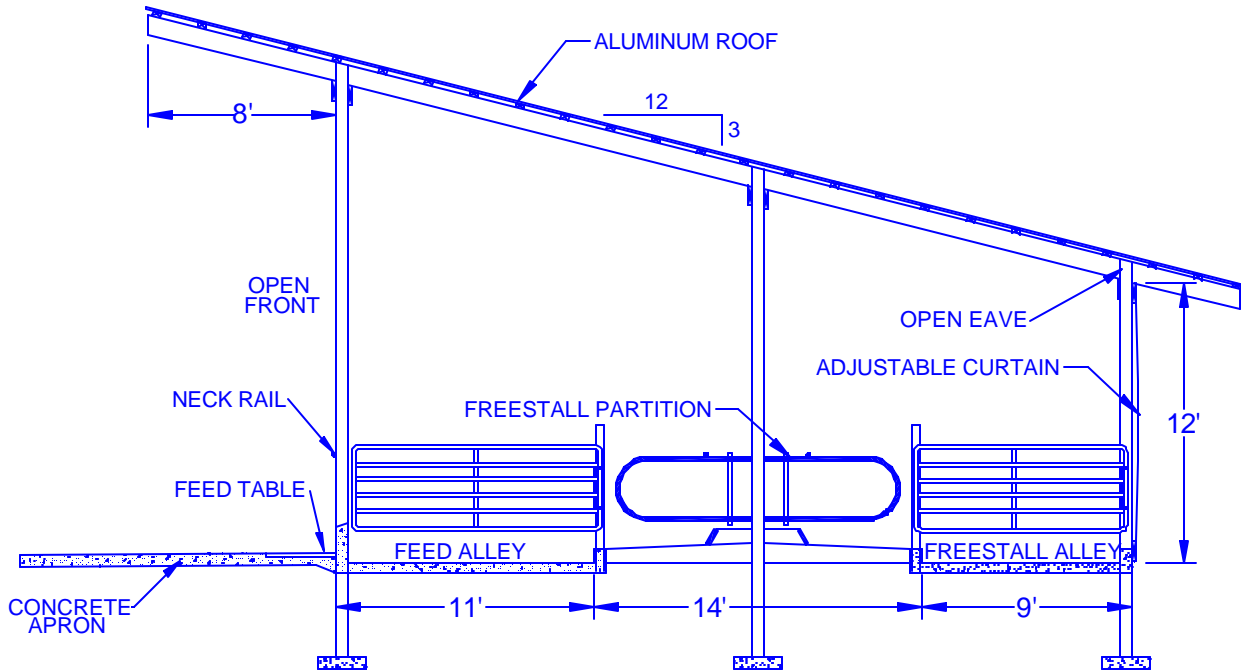


Figure 6. Gated 2 row freestall shelter cross sectional view.

Shown in Figure 7 is a gated three row freestall floor plan for a 200 cow herd with proper freestall dimensions for each submanagement group (labeled A, B, C, and D). Swinging gates are used to keep groups segregated and to confine heifers in the bedded pack area during feed alley scraping. Water bowls are located to serve multiple submanagement groups. A work area is shown on the floor plan located between submanagement groups B and C. This area can also be used to sort heifers between submanagement groups as needed. A portable foot table can be parked in the feed alley to facilitate hoof care. A cross section of this shelter is shown in Figure 8. Three row freestall shelters are an option with a cow herd size of about 200 or more cows.

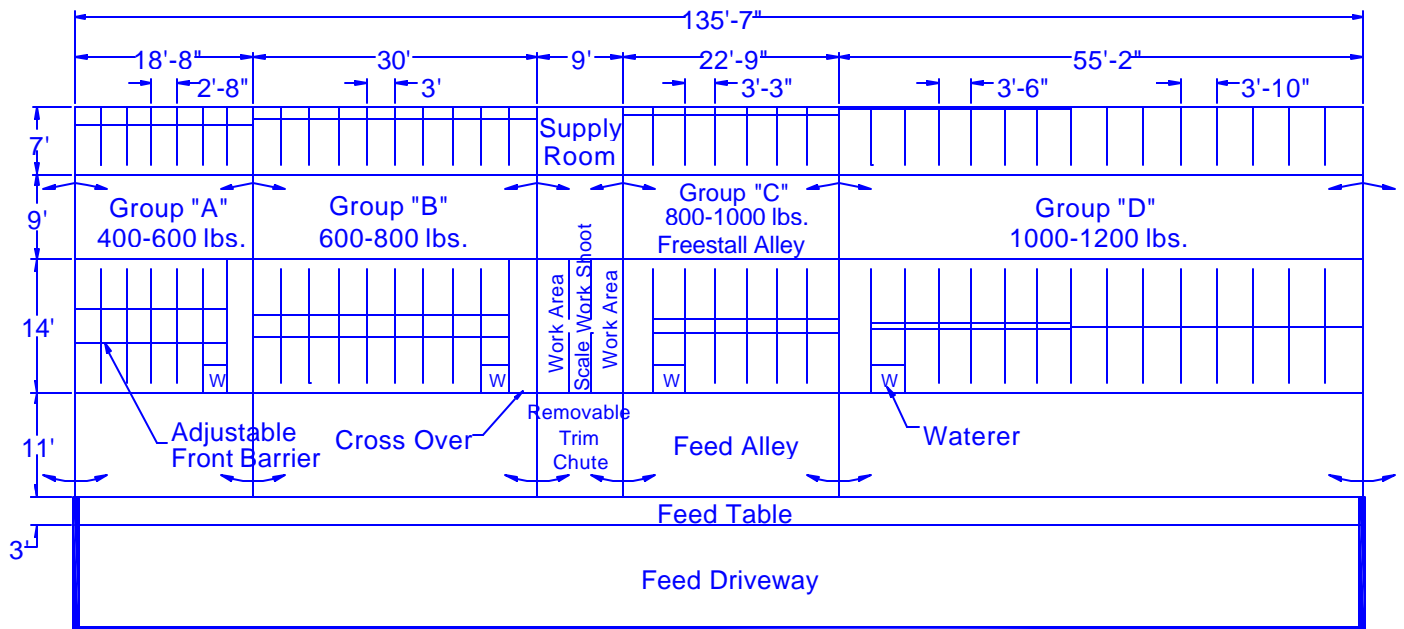


Figure 7. Gated three row freestall shelter floor plan for a 200 cow herd.

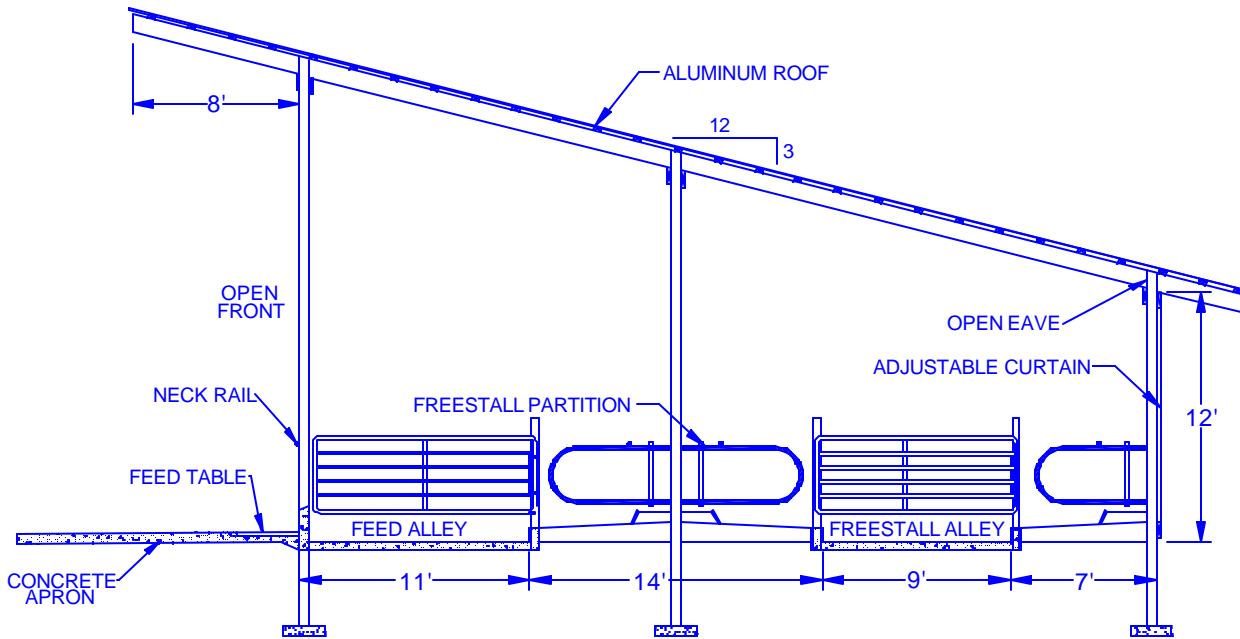


Figure 8. Gated 3 row freestall shelter cross sectional view.

Combination Bedded Pack/Freestall Shelter

A combination bedded pack/freestall shelter can be designed to provide the utmost in management flexibility. A bedded back area can be used to house the first two submanagement groups (A and B) and freestalls for the last two. Surges in calving can be more easily handled with the bedded pack arrangement, and post heifers are moved to freestalls to become familiar with them. A floor plan for a combination gated bedded pack/freestall shelter is shown in Figure 9 for a 100 cow herd.

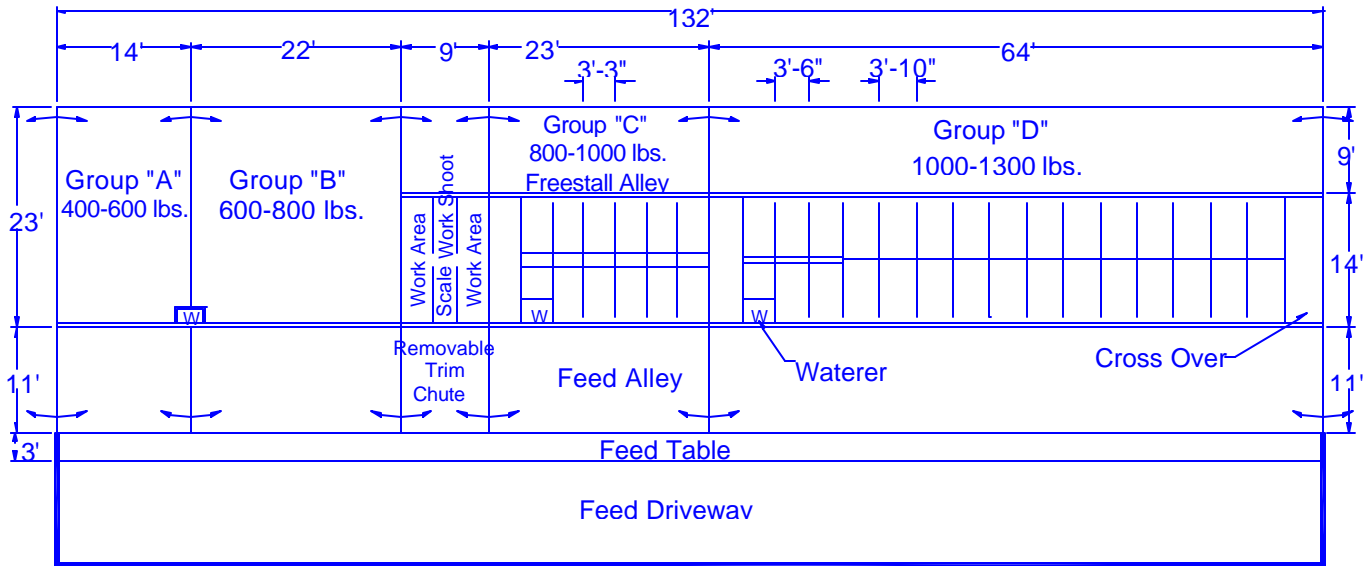


Figure 9. Gated bedded pack/freestall shelter floor plan for a 100 cow herd.