

Foreword

The formulation of this national standard was initiated by the Agricultural Machinery Testing and Evaluation Center (AMTEC) under the project entitled “Enhancing the Implementation of the AFMA Through Improved Agricultural Engineering Standards” which was funded by the Bureau of Agricultural Research (BAR) of the Department of Agriculture (DA).

This standard has been technically prepared in accordance with PNS 01-4:1998 (ISO/IEC Directives Part 3:1997 – Rules for the Structure and Drafting of International Standards. It specifies the general requirements for cattle ranch.

The word “shall” is used to indicate requirements strictly to be followed in order to conform to the standard and from which no deviation is permitted.

The word “should” is used to indicate that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others, or that a certain course of action is preferred but not necessarily required.

In the preparation of this standard, the following references were considered:

Beef Cattle Housing and Feedlot Facilities, Saskatchewan Agriculture and Food, Canada, 2000.

Bicudo, J.R, S. McNeill, J. Anderson, L. Turner and R. Burris. Cattle Handling Facilities – Planning, Components and Layouts, Cooperative Extension Service, College of Agriculture, UK.

Codes of Recommendations for the Welfare of Livestock, Annual Welfare Publications on Farm, Department for Environment, Food and Rural Affairs, United Kingdom.

Design: Corrals with Working Facilities, Cooperative Extension Work in Agriculture and Home Economics, University of Kentucky and USDA Cooperative.

Design of Ranch Corrals and Squeeze Chutes for Cattle, Texas Agricultural Extension Service.

Farm Structures in Tropical Climates, FAO, Rome, 1988.

Recommended Code of Practice for the Care and Handling of Farm Animals, Canada, 1999.

Structures and Environment Handbook. MWPS, September 1977, 9th Edition.

Agricultural Structures – Cattle Ranch

1 Scope

This standard specifies the minimum requirements for cattle ranch. It includes handling facilities, feed storage and fencing.

2 Reference

The following normative document contains provisions which through reference in this text constitute provisions of this National Standard:

PAES 414:2002 Agricultural Structures – Waste Management

3 Definitions

For the purpose of this standard, the following definitions shall apply:

3.1**corral**

enclosure for confining and handling livestock

3.2**holding pen**

pen for confining animals from the pasture

3.3**crowding pen**

pen used to funnel cattle into the working chute

3.4**working chute**

chute leading the cattle from the crowding pen to the holding chute/squeeze

3.5**holding chute**

squeeze

use to restrain animals

3.6**loading chute**

chute used to load cattle from working chute or crowding pen to a vehicle

4 Location

- 4.1 The location shall conform to the land use plan of the area.
- 4.2 The area shall be gently rolling, elevated and well drained.
- 4.3 Land with a slope of not more than 58% shall be used. Steep areas and ravines should be avoided or should be fenced out.

5 Structural requirement

- 5.1 Corral fence boards should be 50 mm x 100 mm - 150 mm. The fence boards shall be treated with preservatives that are not toxic to animals.
- 5.2 Four 150 mm or five 100 mm rails should be attached to the inner part of the post with slightly larger spacing at the top of the fence. The minimum space clearance between horizontal rails of the corral fence shall be 150 mm (Figure 1).

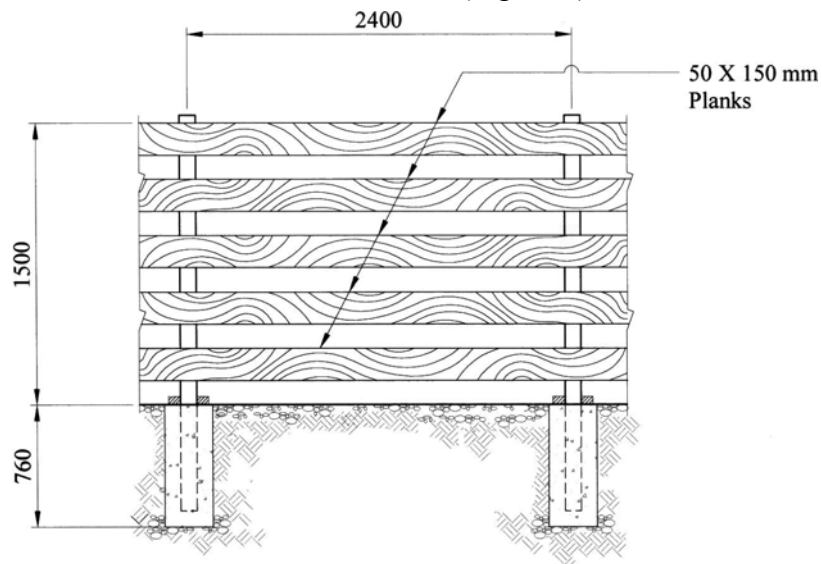


Figure 1 – Typical corral fence

- 5.3 The minimum fence height shall be 1.5 m. For Brahman cross and exotics breeds, the fence height shall be 1.7 m –1.8 m.
- 5.4 Post should be 150mm - 200 mm in diameter and should be set at least 750 mm into the ground. The maximum spacing between posts shall be 2.5 m.

6 Functional requirement

- 6.1 Access alley
 - 6.1.1 Access alley shall be provided to bring the cattle from a pen or pasture to the holding pen.

6.1.2 It shall be at least 3 m wide and shall be laid-out to provide a desired traffic flow.

6.2 Holding pen

6.2.1 There shall be at least one holding pen with a size enough to hold the herd. If necessary, a second pen for sorting should be provided. The minimum space requirement for holding pen is shown in Table 1.

Table 1 – Minimum space requirement for holding pen

Weight of the cattle kg	Space requirement m ² /animal
Up to 270	1.3
270 – 540	1.6
Over 540	1.9

6.3 Crowding pen

6.3.1 Crowding pen should be either circular shape (1/4 or 1/2 circle) or funnel shape.

6.3.1.1 Funnel shaped crowding pens shall be constructed with one straight side and the other side should enter the working chute at an angle of 30 degrees (Figure 2). The funnel should be at least 2 m wide.

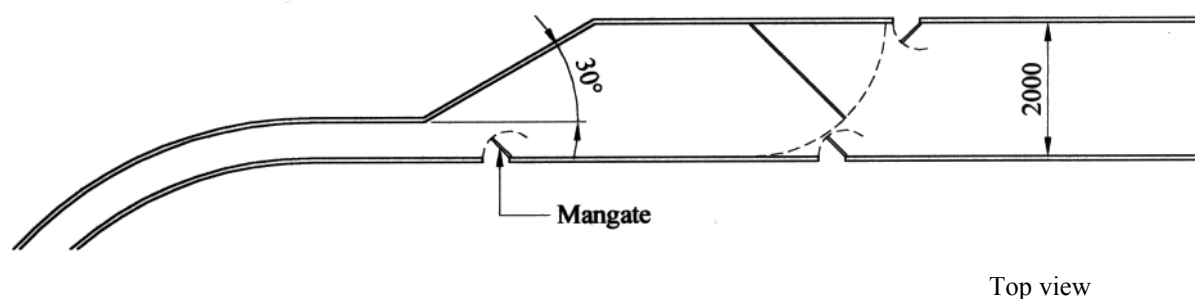


Figure 2 – Funnel-type crowding pen

6.3.1.2 Circular shaped crowding pens shall have a radius of at least 3 m (Figure 3) and equipped with a solid crowding gate (Figure 4). The gate shall be provided with a pivot post constructed out of a 76 mm – 100 mm pipe embedded in concrete. It shall be opened in the direction in which the cattle are being driven and it shall be equipped with a self-locking gate latch.

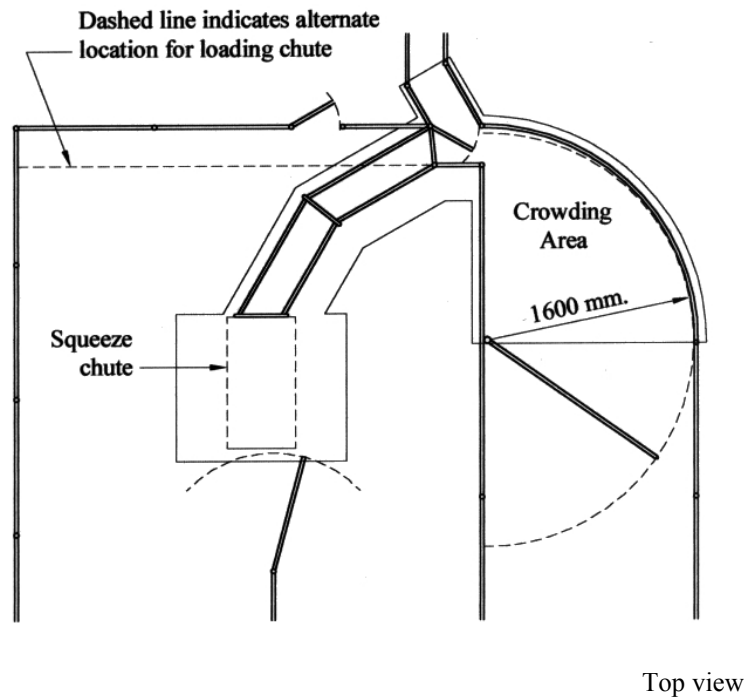


Figure 3 – Circular-type crowding pen

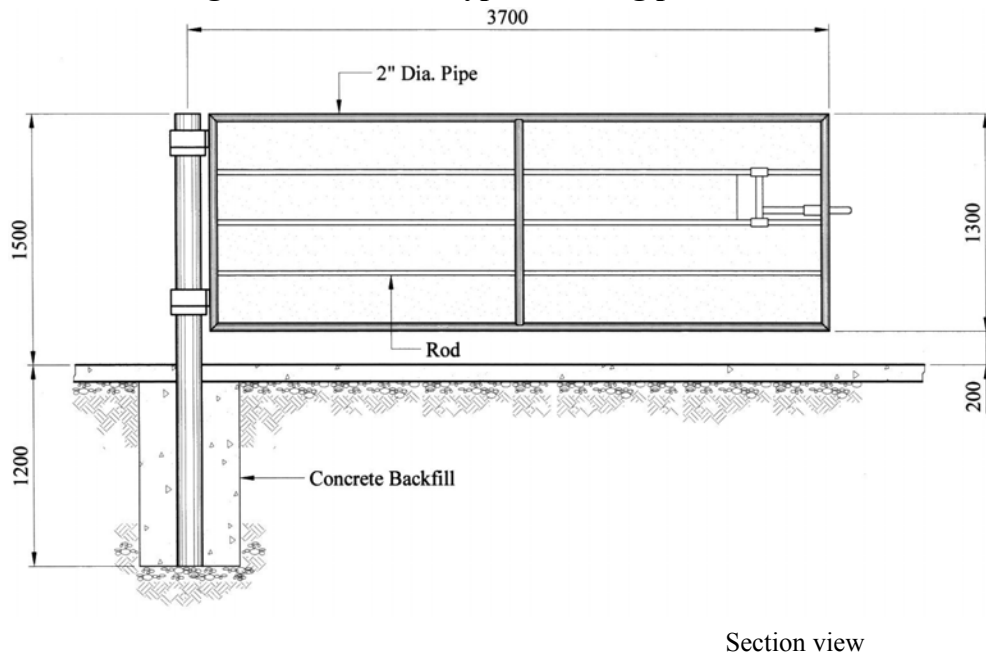


Figure 4 – Crowding pen gate

6.3.2 The minimum space requirement for the crowding pen is shown in Table 2.

Table 2 – Minimum space requirement for crowding pen

Weight of the cattle kg	Space requirement m ² /animal
Up to 270	0.5
270 – 540	0.9
Over 540	1.1

6.3.3 Crowding pen shall have solid walling and the post spacing shall be 1.2 m – 1.8 m. The height of the solid wall shall be 1 m – 1.5 m.

6.4 Working chute

6.4.1 Working chute sides shall be solid sided and shall be provided with blocking gates constructed at the entrance and exit of the working chute (Figure 5). Gates should be constructed either with grills or solid side.

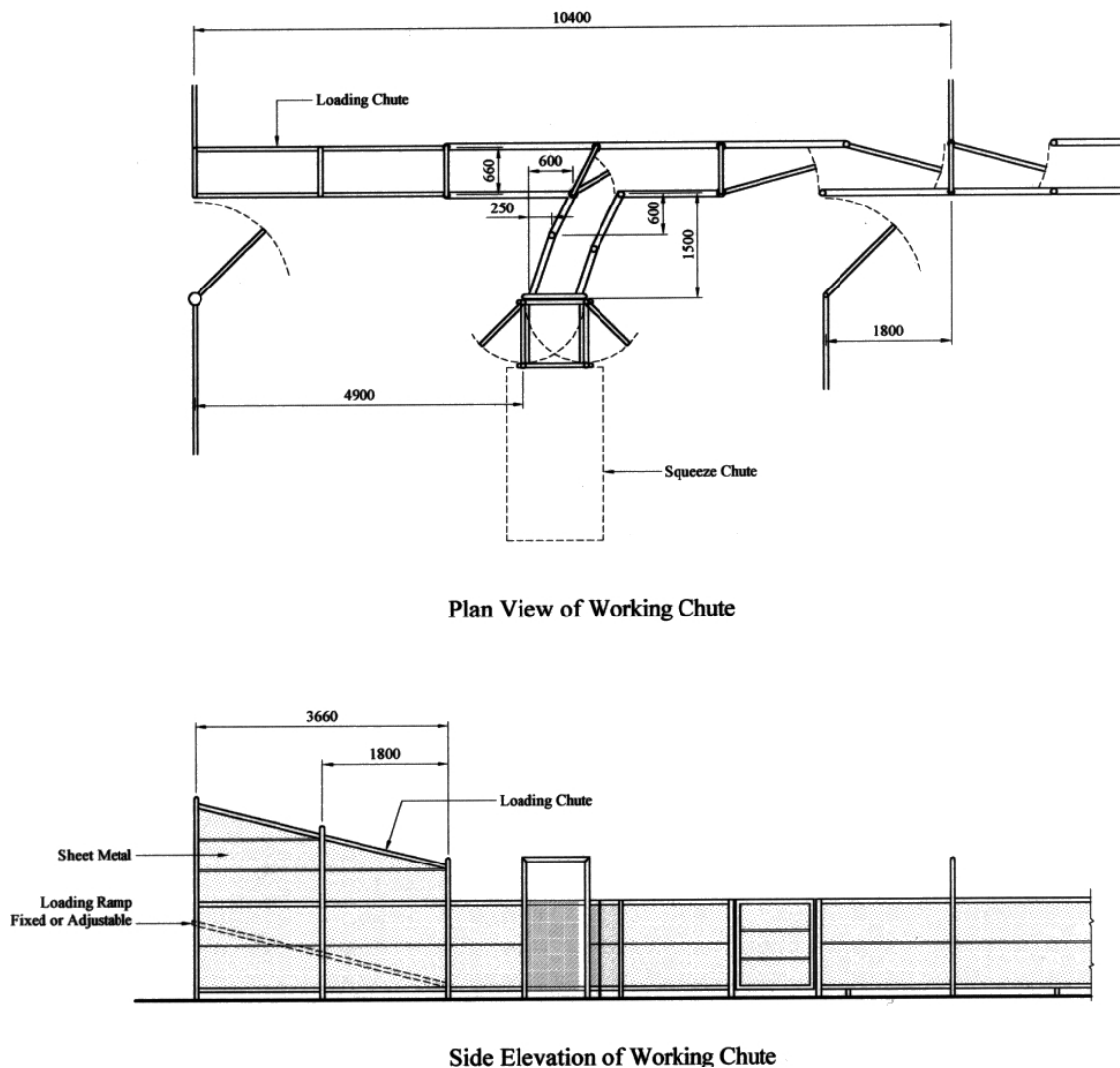


Figure 5 – Sample of a working chute

6.4.2 Working chute wall should be 1 m – 1.5 m high and the overall height including the top rail should be 1.4 m – 1.8 m. The minimum length for a working chute shall be at least long enough to hold three animals waiting to enter the crowding pen.

6.4.3 The post of the working chute should be 1.8 m and should be embedded 0.9 m into the ground.

6.4.4 Working chute should be curved (C or S-shaped with maximum curve angle of 15°) or offset (offset angle at 30° maximum).

6.4.5 Chute should be either straight or tapered (Figure 6). Straight-sided chute should be used for uniform animal sizes. Tapered chute should be used for animals of varying sizes. Chute dimension is shown in Table 3.

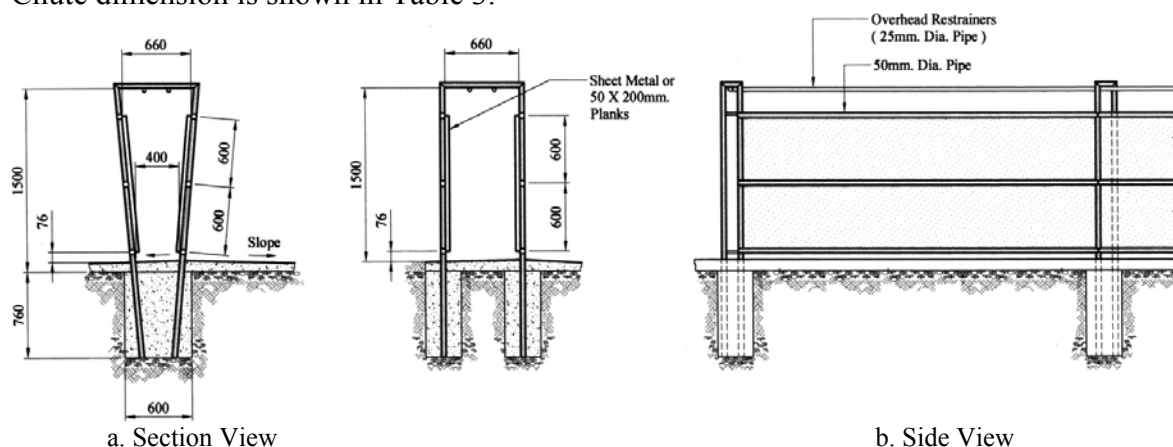


Figure 6 – Types of working chute

Table 3 - Dimensions of working chute

	Dimension m		
	Under 270 kg	270 – 540 kg	Over 540 kg
Working chute with straight side	0.46	0.56	0.71
Working chute with sloping sides			
- Width at 0.8 m height	0.46	0.56	0.71
- Width at bottom	0.38	0.41	0.46
NOTE 1 Add 51 mm to all chute to accommodate bull or large cattle and cows heavy with calf.			

6.5 Holding chute/squeeze

6.5.1 Holding chute/squeeze should be either straight or ‘V’ shaped. The sides should move in and out together so that animals are not thrown out of place.

6.5.2 Dimension of the holding chute/squeeze is shown in Table 4.

Table 4 - Dimension of the holding chute/squeeze

	Dimension m		
	Under 270 kg	270 – 540 kg	Over 540 kg
Height	1.14	1.27	1.27
Width			
- straight sides	0.46	0.56	0.71
- V-shaped sides, width at bottom	0.15 – 0.2	0.2 – 0.3	0.36 – 0.41
Length	1.5	1.5 – 2.4	1.5 – 2.4

6.6 Loading chute

6.6.1 Loading chute should be provided and should be oriented so as to minimize the effect of bright sunlight. The width shall be 0.66 m – 0.76 m.

6.6.2 A catwalk on one side of the chute should be provided to allow the handler to load the cattle easier.

6.6.3 Loading chute should be provided with telescoping side panels and a self-aligning dock bumper.

6.6.4 The chute should be provided with loading ramp with a level-loading surface of about 1.5 m wide to walk on or off the truck. The height of loading ramp for different types of vehicle is shown in Table 5.

Table 5 – Ramp height for different vehicles

Vehicle	Height m
Gooseneck trailer	0.4
Pick-up truck	0.7
Van-type truck	1.0
Tractor trailer	1.2
Double deck	2.5

6.7 Loading ramp

6.7.1 Loading ramp floor shall have cross battens every 0.2 m to prevent slipping.

6.7.2 Ramp should have a slope of 30%.

6.7.3 The slope of the permanently installed ramp shall not exceed 36%. For portable or adjustable loading chute, slope shall not exceed 47%.

6.7.4 If stair-stepped concrete ramps are provided, each step should have 90 mm – 100 mm rise and 300 mm tread width. The step surface shall be roughened.

6.8 Facilities

6.8.1 Footbath

6.8.1.1 At least two footbaths should be provided with a dimension of 4.5 m long and 0.25m – 0.3 m deep.

6.8.1.2 The floor of the footbath should be studded with hard stones set into the concrete to provide grip and to splay the hoofs apart to loosen any mud in between.

6.8.1.3 It should be provided with overflow outlet and the floor level outlet pipe should be opened for cleaning.

6.8.2 Weighing scale

Platform weighing scale should be provided and shall be located adjacent to the working chute or within the corral system.

6.8.3 Dipping vat (optional)

6.8.3.1 Dipping vat should be constructed if the herd is 200 animal units or more. The vat should be built on one side of the corral system where water supply is abundant and it should be near the center of the grazing.

6.8.3.2 The ground where the dip is to be built should be slightly sloping and as hard as to allow digging.

6.8.3.3 It should be constructed from poured reinforced concrete and should be provided with roof.

6.8.3.4 For large numbers of cattle to be dipped, a long single draining race is recommended. The side should be sloping towards the channel or gutter which increases the back-flow rate.

6.8.3.5 A silt trap should be provided to prevent the mud from flowing back to the dipping vat.

6.8.3.6 Provision should be made to divert rainwater away from the dipping vat.

6.9 Feed storage

Storage sheds for all feedstuffs – hay, grain, mineral salt, shall be provided to keep it dry, protect from rodents and be inaccessible to animals.

6.10 Field fencing

6.10.1 Divisional fence

6.10.1.1 The top wire (i.e. barbed wire) shall be 1.4 m high. The wire spacing downward should be 500, 500 and 400 mm intervals.

6.10.1.2 Fence posts should be concrete with a minimum dimension of 100 mm x 100 mm. Maximum spacing between post shall be 5 m and it shall be 1.5 m high. The depth of the post in the ground shall be 0.75 m or deeper depending on the type of soil. If the distance between posts is more than 5 m, battens shall be used at the intervals between the posts to keep the wire spacing rigid. Smaller staples should be driven in tight to prevent the battens from moving side to side.

6.10.1.3 Battens which are intended to grow should have their tops leveled with the top of the posts and should have a clearance of 75 mm from the ground.

6.10.2 Perimeter fence

Perimeter fence shall be 1.5 m high. It shall be provided with four strands wire equally spaced at 0.3 m. For details and specification of fence post, refer to **subclause 6.10.1.2**.

7 Waste disposal

For waste management, refer to PAES 414:2002 Agricultural Structures – Waste Management Structures.

Annex A
(informative)

Typical layout of cattle corral

