

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 beef cattle production.

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:

ASAE EP344.1, Lighting for Dairy Farms and the Poultry Industry, ASAE Standard, 1986

Beef Cattle Feedlots, Department of Primary industries, Queensland, June 2001

Beef Cattle Housing and Equipment, Canada Plan Service, 2000.

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

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

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

Maghirang, R.G, V. G. Gayanilo, V.S. Luis and N.G. Natural. An Assessment of Animal Housing Systems in Beef and Dairy Cattle Farms in the Philippines. Philippine Technology Journal, Vol. XII No. 3, July – September 1987.

Philippines Recommends for Beef Cattle Production, Philippine Council for Agriculture, Forestry, and Natural Resources Research and Development, 1994.

Recommendation Concerning Cattle, Department for Environment, Food and Rural Affairs, United Kingdom.

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

Agricultural Structures – Cattle Feedlot

1 Scope

This standard specifies the minimum requirements for cattle feedlot. It includes space requirement, feeding, and watering facilities.

2 Reference

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

Philippine Electrical Code 2000

PAES 414:2002 Agricultural Structures – Waste Management

3 Definitions

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

3.1**feedlot**

area with its physical facilities used for cattle fattening

3.2**bull**

breeding male of any age

3.3**calf**

young male or female under one year of age

3.4**cow**

mature female that has already calved

3.5**heifer**

female between two to three years of age which has not given birth

4 Location

- 4.1 The location shall conform to the land use plan of the area.
- 4.2 The site shall be accessible to service roads, water supply and electric lines.
- 4.3 The site shall be well drained and allows for free air circulation.
- 4.4 The building shall be constructed in an east-west orientation and the structure for marketable animals shall be located near the service road.
- 4.5 The site shall be located where the prevailing winds will not carry odors to the farmhouse.

6 Space requirement

The recommended minimum floor space requirement for cattle is shown in Table 1.

Table 1 – Minimum floor space requirement for cattle

Area	Floor space m ² /animal
Shed area	4
Loafing area	5

7 Structural requirement

7.1 Floor

7.1.1 Concrete floors shall be skid resistant. The minimum floor thickness shall be 76 mm with 2 - 4% slope towards the drainage.

7.1.2 If the floor is earth lot, it shall have a slope of 4 - 7%.

7.2 Roof

7.2.1 Adequate roofing shall be provided against excessive heat from the sun.

7.2.2 The roof slope shall not be less than 25%. If roofing is made of indigenous materials, the minimum roof slope shall be 58%.

7.2.3 The minimum height of the top of the roof beam shall be 2.5 m from the floor.

7.3 Pen wall

7.3.1 Pen walling and post shall be preferably made of G.I. pipes schedule 40. The diameter of vertical and horizontal railing member of the pen wall shall be at least 50 mm and 75 mm for the post.

7.3.2 The maximum center to center spacing between vertical railing members shall be 1.5 m and for horizontal railing member, spacing shall be 400 mm.

7.3.3 The maximum center to center spacing between post shall be 3 m and shall be embedded in a concrete pedestal with a minimum depth of 400 mm (Figure 1).

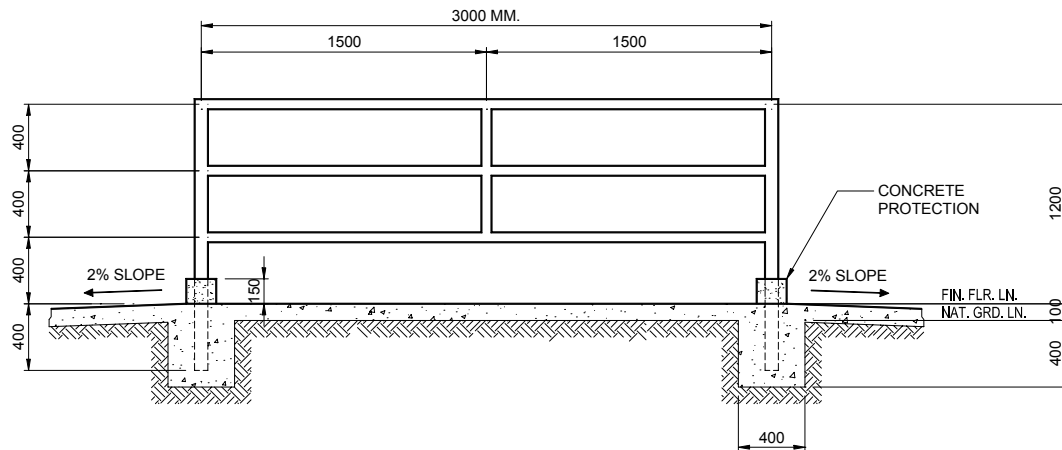


Figure 1 – Sample of slotted pen wall

7.3.4 Each post shall be provided with 150 mm concrete protectors.

7.3.5 The pen shall be 1.2 m – 1.5 m high.

7.3.6 Fittings and internal surfaces of the pens shall be free from sharp edges or projections to avoid injury to the animals.

7.3.7 Paints that may be toxic to animals shall not be used on surfaces accessible to them.

8 Functional requirement

8.1 Pen size

Pen width should be adequate to provide the required trough length for the number and size of cattle being fed in the pen.

8.2 Pen Facilities

8.2.1 Feeding trough

8.2.1.1 Feeding trough shall be placed in front of the pen.

8.2.1.2 Inside surfaces of the feeding trough should be smooth and it should have rounded corners to facilitate cleaning.

8.2.1.3 The dimension of the feed trough should be 400 mm depth, 450 mm – 700 mm bottom width and 700 mm – 900 mm top width (Figure 2).

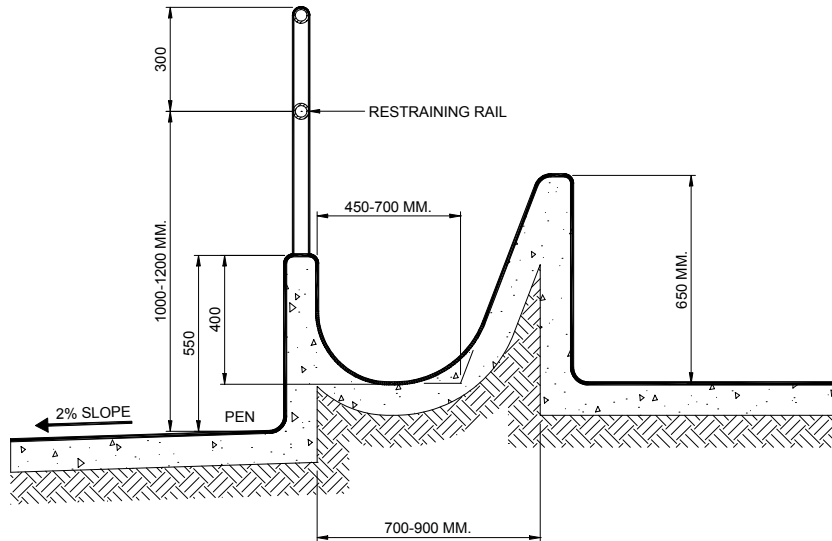


Figure 2 – Typical cross section of a feeding trough

8.2.1.4 The bed of the trough should be 150 mm above the level of the apron to facilitate natural feeding stance.

8.2.1.5 Feeding trough shall be provided with horizontal rail to restrain the animals from stepping the trough. The height from the pen floor should be 1m - 1.2 m.

8.2.1.6 The feeding troughs shall be provided with concrete or gravel packed aprons to improve sanitation, if the pen has an earth floor. Minimum length of concrete aprons shall be 1.5 m.

8.2.1.7 The minimum space requirement for feeding shall be 750 mm/animal.

8.2.2 Watering facility

8.2.2.1 Water troughs should be made of concrete (Figure 3) or galvanized metal tanks. Float activated valve should be provided to regulate the water level.

8.2.2.2 The water troughs shall be provided with concrete or gravel packed aprons to improve sanitation and keep the water clean, if the pen has an earth floor. Minimum length of concrete aprons shall be 1.5 m.

8.2.2.3 For the open water tank, 250 linear mm shall be provided for 8-10 head.

8.2.2.4 If automatic waterer is used, one automatic waterer should be provided for 15 animals and it should be placed at a height of 1m.

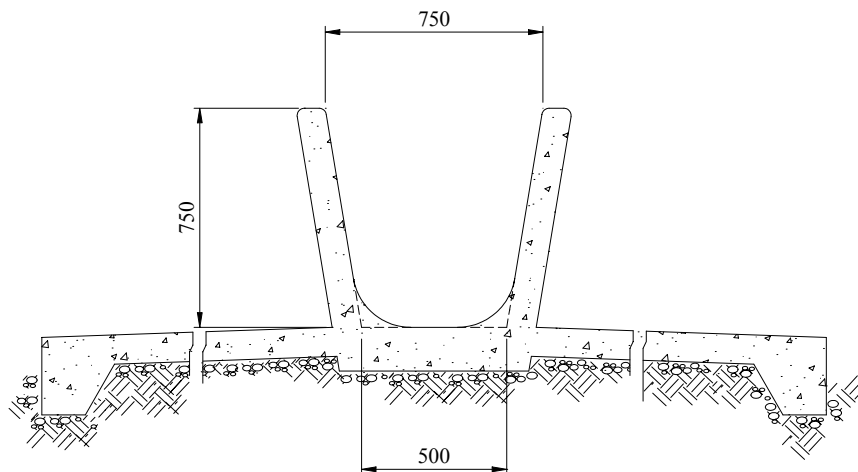


Figure 3 – Typical drinking trough

8.2.3 Lighting

8.2.3.1 The housing shall be provided with lighting intensity of 200 lux (refer to Annex B).

8.2.3.2 All electrical installations shall be inaccessible to all animals and it shall conform to Philippine Electrical Code.

8.3 Loading chute

8.3.1 Loading chute should be provided and should be oriented so as to minimize the effect of bright sunlight. The width shall be 660 mm – 760 mm.

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

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

8.3.4 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 2.

8.4 Loading ramp

8.4.1 Loading ramp floor shall have cross battens every 200 mm to prevent slipping.

8.4.2 Ramp should have a slope of 30%.

Table 2 – 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

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

8.4.4 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.

8.5 Passage (if necessary)

The central alley or the driveway should be elevated and shall have a minimum width of 3 m if vehicles are allowed to enter within the building and it shall have a solid base.

8.6 Weighing scale

Platform weighing scale should be provided.

8.7 Drainage

The gutter shall have a minimum width of 460 mm and a minimum depth of 200 mm.

8.8 Feed storage

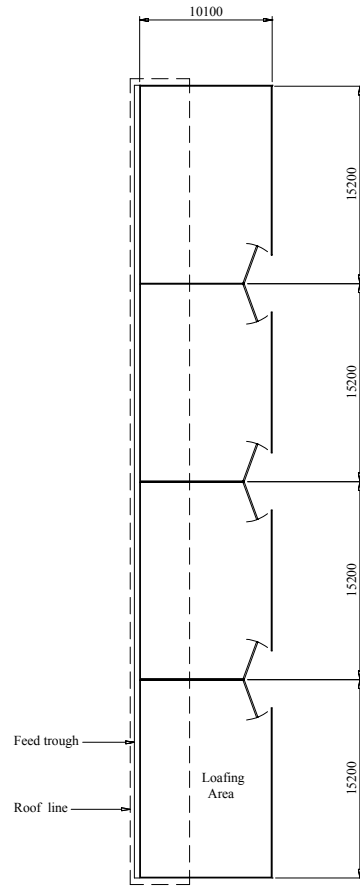
Storage sheds for all feedstuffs – hay, grain, mineral salt, shall be provided to keep it dry, protect from rodents and be inaccessible to animals.

9 Waste disposal

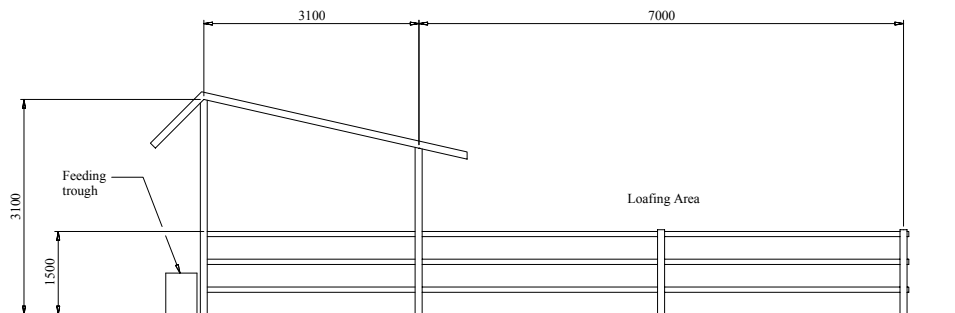
For waste management, refer to PAES 414:2002 Agricultural Structures – Waste Management Structures.

Annex A
(informative)

Typical layout of a cattle feedlot



Floor Plan



Side Elevation

Annex B
(informative)

Lighting Requirements

Lighting Intensity lux	No. of Bulbs Required per m ²							
	Incandescent lamp						Fluorescent lamp	
	25W	40W	60W	100W	150W	200W	20W	40W
500	3.935	1.989	1.052	0.520	0.314	0.226	0.682	0.266
400	3.148	1.591	0.842	0.416	0.251	0.181	0.546	0.213
300	2.361	1.193	0.631	0.312	0.189	0.136	0.409	0.160
200	1.574	0.796	0.421	0.208	0.126	0.090	0.273	0.107
150	1.180	0.597	0.316	0.156	0.094	0.068	0.205	0.080
100	0.787	0.398	0.210	0.104	0.063	0.045	0.136	0.053
50	0.393	0.199	0.105	0.052	0.031	0.023	0.068	0.027
10	0.079	0.040	0.021	0.010	0.006	0.005	0.014	0.005