

## **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 carabao feedlot.

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:

Carabao Production in the Philippines, Philippine Council for Agriculture, Forestry, and Natural Resources Research and Development, FAO, UNDP Programme, Book series No. 126, 1992.

Philippines Recommends for Carabao Production, Philippine Council for Agriculture, Forestry, and Natural Resources Research and Development, 1978.

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**Agricultural Structures – Carabao Feedlot**

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**1 Scope**

This standard specifies the minimum requirements for carabao feedlot. It includes space requirements, 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****National Plumbing Code of the Philippines**

**PAES 414:2002**      Agricultural Structures – Waste Management Structures

**3 Definitions**

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

**3.1****feedlot**

area with its physical facilities used for carabao fattening

**3.2****carabao**

Philippine water buffalo or swamp buffalo

**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.

## 5 Space requirement

The minimum space requirement shall be 4 m<sup>2</sup>/animal.

## 6 Structural requirement

### 6.1 Floor

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

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

### 6.2 Roof

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

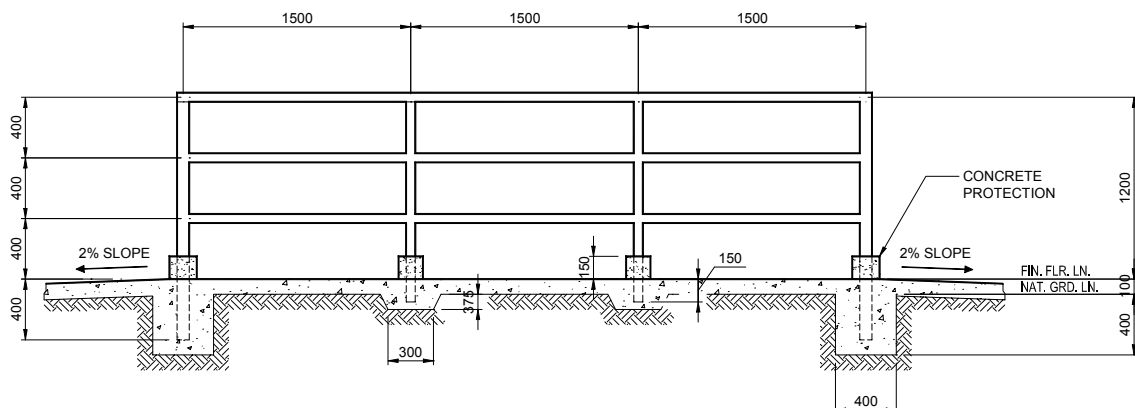
**6.2.2** The roof slope shall not be less than 25%. If roofing is made of indigenous materials, the minimum roof slope shall be 58%.

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

### 6.3 Pen walling

**6.3.1** 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.

**6.3.2** The maximum center to center spacing between post shall be 1.5 m and shall be embedded in a concrete pedestal with a minimum depth of 0.4 m (Figure 1).



**Figure 1 – Sample of slotted pen wall**

**6.1.3** Each post shall be provided with 0.15m concrete protectors.

**6.1.4** The pen shall be 1.2 m – 1.5 m high.

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

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

## 7 Functional requirement

### 7.1 Pen size

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

### 7.2 Pen Facilities

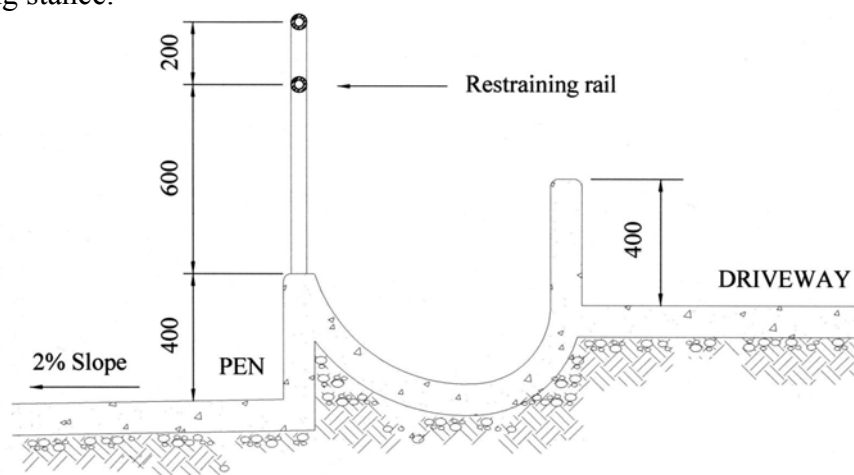
#### 7.2.1 Feeding trough

**7.2.1.1** Feeding trough shall be placed in front of the pen.

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

**7.2.1.3** The dimension of the feed trough should be 0.4 m depth, 0.45 m – 0.7 m bottom width and 0.7 m – 0.9 m top width (Figure 2).

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



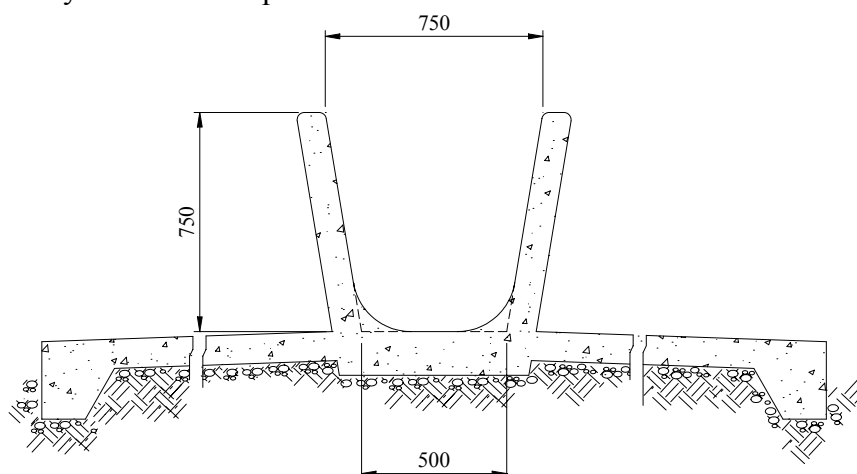
**Figure 2 – Sample of a feeding trough**

**7.2.1.5** The minimum space requirement for feeding shall be 0.750 m/animal.

**7.2.1.6** Restraining horizontal rail shall be provided to prevent the animals from stepping into the trough. This rail shall be 1m - 1.2 m from the floor supported by the post spaced at 1 m.

## 7.2.2 Watering facility

7.2.2.1 Water troughs should be made of concrete (Figure 3) or galvanized metal tanks. Its shape should be cylindrical or trapezoidal.



**Figure 3 – Cross section of a typical drinking trough**

7.2.2.2 The water troughs should 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.

7.2.2.3 The open water tank space shall be at least 0.3 m for every 10 heads.

## 7.2.3 Cooling facilities

For a feedlot with more than five heads, a built in sprinklers shall be provided. All plumbing design and installation shall conform to the National Plumbing Code of the Philippines.

## 7.2.4 Lighting

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

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

## 7.3 Loading chute

7.3.1 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.

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

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

**7.3.4** 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 1.

**Table 1 – Ramp height for different vehicles**

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

#### **7.4 Loading ramp**

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

**7.4.2** Ramp should have a slope of 30%.

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

**7.4.4** 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.

#### **7.5 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.

#### **7.6 Weighing scale**

Platform weighing scale should be provided.

#### **7.7 Drainage**

The gutter shall have a minimum width of 0.46 m and a minimum depth of 0.2 m.

#### **7.8 Feed storage**

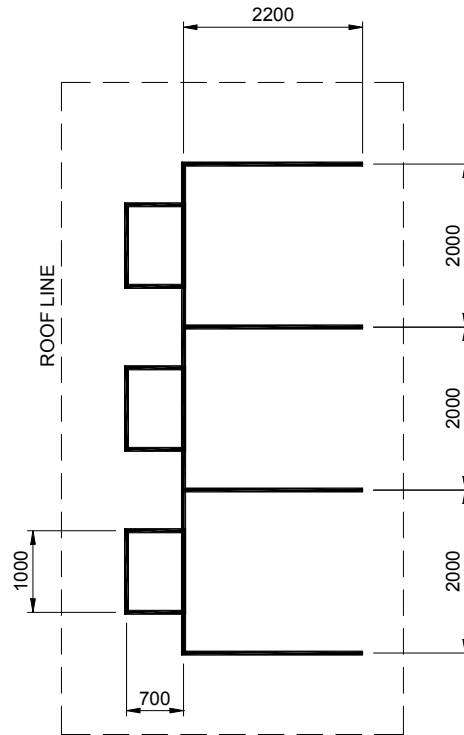
Storage sheds for all feedstuffs – hay, grain, mineral salt, shall be provided to keep it dry, protect from rodents and be inaccessible to animals.

### **8 Waste disposal**

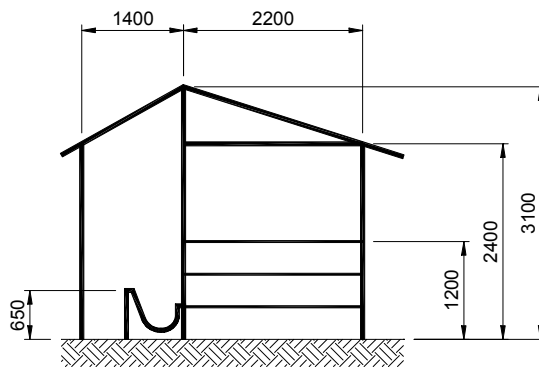
For further waste management, refer to PAES 414:2002 Agricultural Structures – Waste Management Structures.

**ANNEX A**  
(informative)

**Sample of a Carabao Feedlot**



TOP VIEW



SIDE VIEW

**Annex B**  
(informative)

**Lighting Requirements**

Lighting Intensity lux	No. of Bulbs Required per m <sup>2</sup>							
	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