

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 the goat and sheep housing.

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:

Codes of Practice: Welfare of Animals – Goat.

Codes of Practice: Welfare of Animals – Sheep.

Codes of Recommendations for the Livestock: Goats.

Codes of Recommendations for the Welfare of Sheep.

Doane, Ted H. Sheep Space Allotments. Neb Guide. University of Nebraska, 1996.

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

Feeding and Housing Dairy Goats, 1993

Harwell, Lynn and Frank Pinkerton, Housing, Fencing, Working Facilities, and Predators.

Housing Goats, British Goat Society, 2000.

Philippines Recommends for Goat Farming, Philippine Council for Agriculture, Forestry and Natural Resources Research and Development, Los Baños, Laguna, 1999.

Philippines Recommends for Sheep Raising, Philippine Council for Agriculture, Forestry and Natural Resources Research and Development, Los Baños, Laguna, 1989.

Philippines Recommends for Sustainable Small Ruminant-Coconut Production System, Philippine Council for Agriculture, Forestry and Natural Resources Research and Development, Los Baños, Laguna, 1994.

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

Schoenian, Susan, Facilities and Equipment for Commercial Meat Goat Production.

Agricultural Structures – Housing for Goat and Sheep

1 Scope

This standard specifies the minimum requirements for goat and sheep housing. It includes space requirement, feeding, watering and handling 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 Structures

3 Definitions

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

3.1**buck**

mature male goat

3.2**doe**

mature female goat that has kidded

3.3**dry doe**

doe without milk

3.4**kid**

young goat under six months old of either sex

3.5**ewe**

mature female sheep that has already lambed

3.6**lamb**

sheep under six months of age

3.7

ram

mature male sheep

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 Classification

5.1 Type of housing

5.1.1 Shed type

Animals can move freely in or out of the housing area and into the paddock or feeding area (Figure 1). Feeding and watering trough, mineral feeders and grain bunks are located on concrete pads at the center or along the side of the shed.

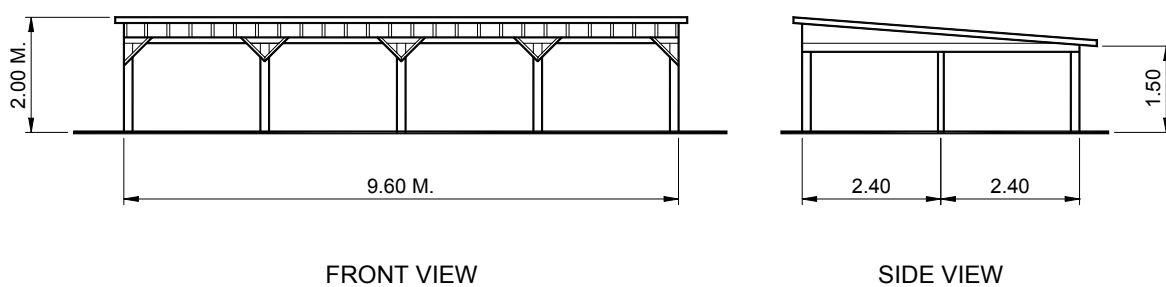


Figure 1 – Typical plan of a shed type

5.1.2 Pen-barn type

5.1.2.1 Stall barns

Each animal is confined in a stall. Stalls are provided with individual feeding and watering trough (Figure 2)

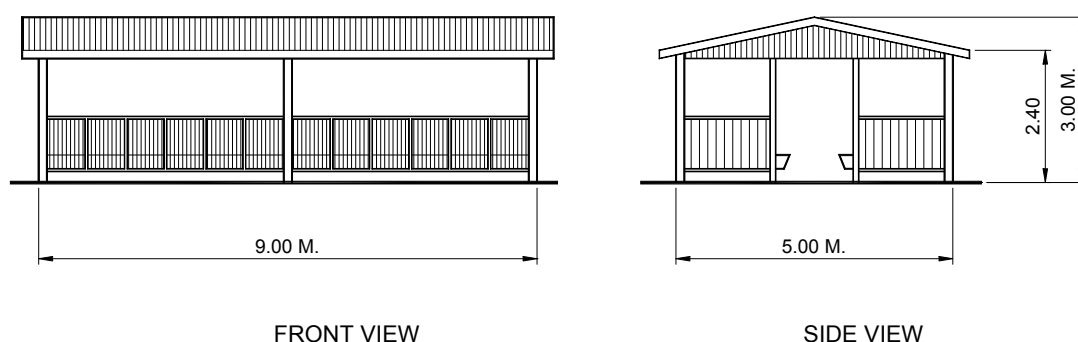


Figure 2 – Typical stall barn

5.1.2.2 Confined housing

In confined housing (Figure 3), group pens for animals with the same sizes should be constructed and provided with an ample area for exercise. Feeding trough should be fenced off with bamboo or wooden slats providing ample space that will enable the animals to insert only its head. This will prevent the animal from stepping or trampling the grasses. Watering devices should be placed in an area where spilled water will not mess up the pen.

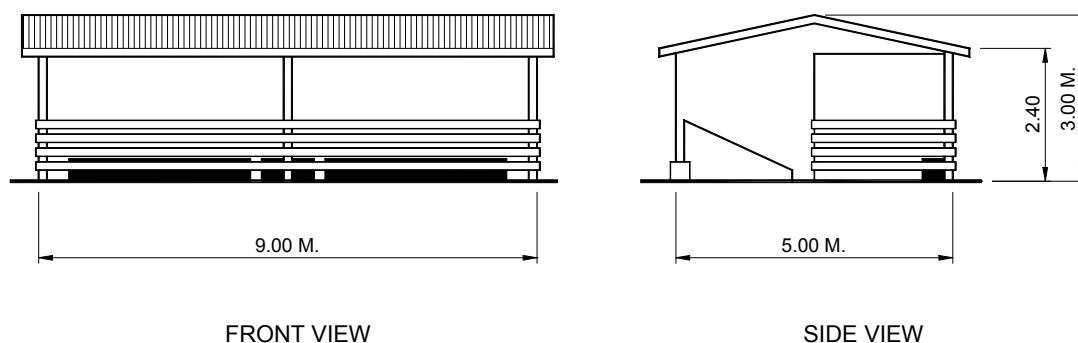


Figure 3 – Typical plan of a confined housing

6 Space requirement

6.1 The recommended minimum floor space requirement for goats and sheep is shown in Table 1.

6.2 For the pregnant and lactating doe/ewe, the minimum space requirement is shown in Table 2.

Table 1 – Minimum floor space requirement for goats and sheep in intensive production related to live weight

Animal	Weight kg	Floor space m ² /animal		
		Solid floor	Slotted floor	Open yard
Doe/Ewe	35	0.8	0.7	2
Doe/Ewe	50	1.1	0.9	2.5
Doe/Ewe	70	1.4	1.1	3
Kid/Lamb		0.4 - 0.5	0.3 - 0.4	-
Buck/Ram		3.0	2.5	-

Table 2 – Minimum floor space requirement for pregnant and lactating doe/ewe related to weight

Doe/Ewe	Floor space m ² /animal	
	Pregnant	Lactating
Small (50 kg – 70 kg)	1.3	2.0
Large (over 70 kg)	1.6	2.3

6.3 A fenced loafing area of 150 m²/50 head shall be provided adjacent to the animal housing.

7 Structural requirement

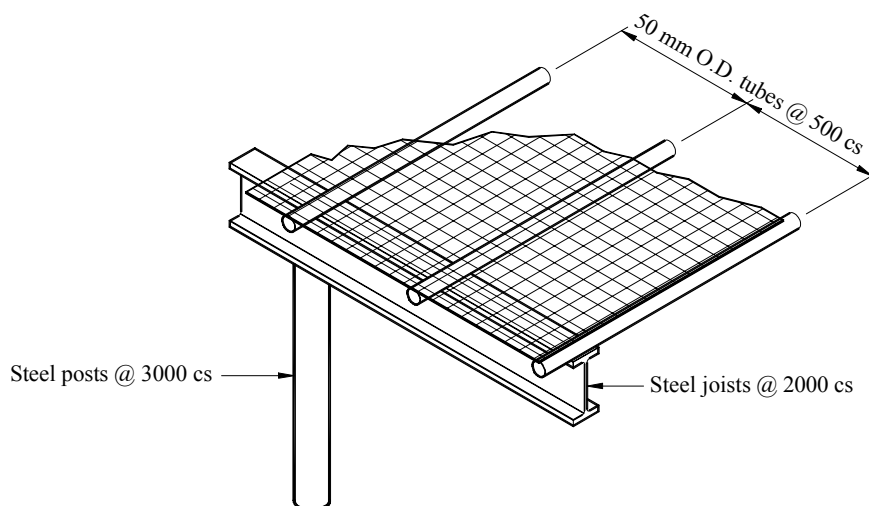
7.1 Floor

7.1.1 For slatted floor, the slats should be 70 mm - 100 mm wide, 25 mm - 30 mm thick and should be laid with slot space of 10 mm - 25 mm. For goats, staircase type and elevated type of slatted flooring should be constructed. The minimum step width shall be 800 mm and the vertical distance between steps shall be 300 mm.

7.1.2 If the slatted floor is made of galvanized welded mesh (Figure 4), the diameter of the wire shall be 5 mm and the mesh spacing shall be 20 mm.

7.1.3 The slatted floor shall be at least 1 m above the ground. The floor underneath the slatted floor should be either concrete or rammed earth floor that slopes towards the drainage. The concrete floor shall have a minimum slope of 2% and the earth floor shall have a minimum slope of 4%.

7.1.4 For concrete floor, it shall be skid resistant and well drained. The floor slope should be 2% - 4%.



Note: Dimensions are in millimeter

Figure 4 – Slatted floor made of galvanized welded mesh

7.2 Roof

7.2.1 Adequate roofing shall be provided against rain and intense heat from the sun.

7.2.2 For the shed type housing, the roof shall slope towards the back of the shed. The height of the front eave shall be at least 2 m and the height of the rear eave shall be at least 1.5 m.

7.2.3 For adequate ventilation, roof slope shall not be less than 25%. If roofing is made of indigenous materials, the minimum roof slope shall be 58%.

7.3 Wall

7.3.1 Adequate walling shall be provided against rain.

7.3.2 A clearance of 150 mm – 300 mm between floor to wall and wall to beam should be provided to create an adequate circulation of air and to lower draft.

8 Functional requirement

8.1 Pens for pen barn type housing

8.1.1 Height of pen wall and gate shall vary according to breed but shall not be less than 1.2 m.

8.1.2 Pen wall and gates should be made of cyclone wire, metal bars or wooden slats. For metal bars and wooden slats, slot size should be 50 mm – 100 mm.

8.1.3 If the wall is galvanized welded or woven mesh (Figure 5), the maximum mesh dimension shall be 100 mm x 100 mm and the post shall be made up of galvanized steel (70 mm in diameter).

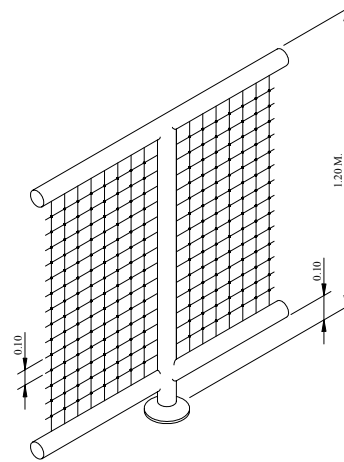


Figure 5 – Slatted wall

8.1.4 Fittings and internal surfaces of all buildings and equipment to which the animals have access shall not have sharp edges or projections.

8.1.5 Surfaces shall not be treated with paints or wood preservatives that may cause illness or death.

8.1.6 A brooder box shall be provided for newly born kids/lambs. One side shall be open and box dimension should be 500 mm x 450 mm x 350 mm.

8.1.7 The pen for the kids/lamb shall have at least one side slatted to permit air movement.

8.1.8 Each pen shall be provided with hayracks, feed and water troughs.

8.2 Pen facilities

8.2.1 Feeding trough and hay racks

8.2.1.1 Feeding troughs should be trapezoidal or semi-cylindrical. The feeding trough depth should be 180 mm – 250 mm with a width of 300 mm and it shall be raised off the ground at least 150 mm to keep the animals out.

8.2.1.2 Hay racks shall have diagonal or vertical slats with a minimum spacing of 130mm (Figure 6). Hay racks shall be properly positioned and designed to avoid the risk of injury.

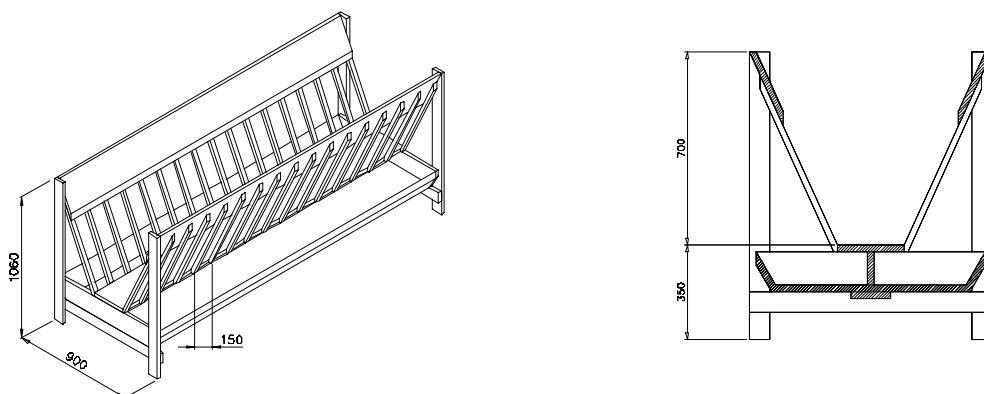


Figure 6 – Feeding rack

8.2.1.3 Recommended linear feeding space is shown in Table 3.

Table 3 – Minimum linear feeding space related to live weight

Animal	Weight kg	Feeding space linear mm/animal
Doe/Ewe	35	350
Doe/Ewe	50	400
Doe/Ewe	70	450
Kid/Lamb		250
Buck/Ram		500

8.2.2 Watering facility

8.2.2.1 Water troughs should preferably concrete. Figure 7 shows a typical example of water trough.

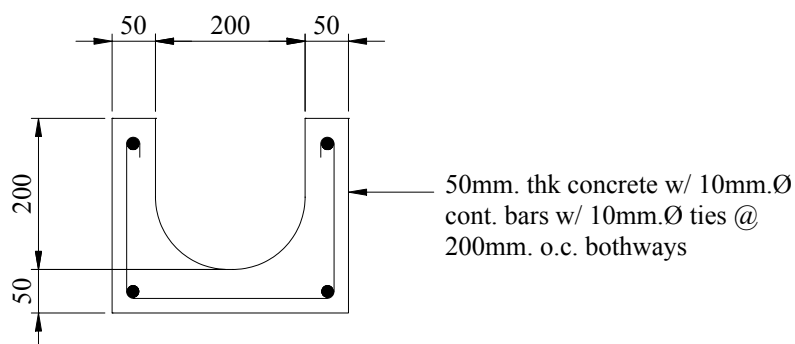


Figure 5 – Concrete water trough

8.2.2.2 In an open tank drinking system, 300 mm of space is required for each 15 - 25 head. In an automatic watering system, 1 bowl or nipple shall be provided for every 50 head.

8.2.2.3 Watering devices shall be placed in an area where spilled water is easily drained.

8.2.2.4 For free range, apron around the waterers shall be paved or packed with gravel at least 750 mm width.

8.3 Breeding facilities (optional)

8.3.1 A separate kidding or lambing pen with a minimum dimension of 1 m x 1.5 m shall be provided.

8.3.2 For every ten does or ewe, one kidding or lambing pen shall be provided.

8.3.3 Buck/ram shall be housed separate from milking herd and downwind from the milking herd.

8.4 Milking area (optional)

Milking area shall be separated from where the goats are kept and it shall be provided with milking stall as shown in Figure 8.

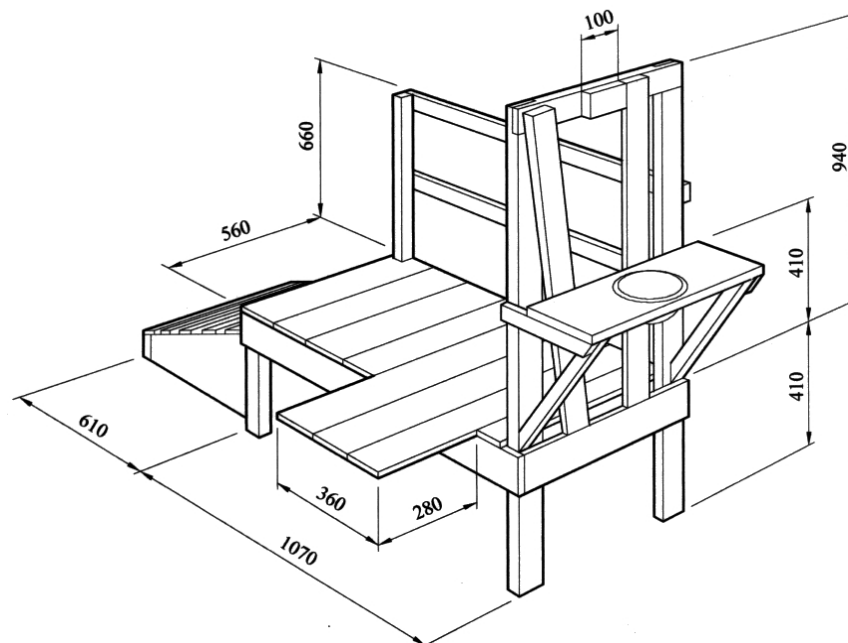


Figure 8 – Milking stand

8.5 Lighting and Electrical installation

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

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

8.6 Field fencing

8.6.1 The height of the fence shall be at least 1.5 m.

8.6.2 Post shall be spaced not more than 4 m apart and shall be embedded at least 300 mm into the ground.

8.6.3 If woven wire is used as fencing material, the maximum spacing between horizontal lines should be 150 mm. However, the spacing between the horizontal lines can be made wider as the fence gets taller.

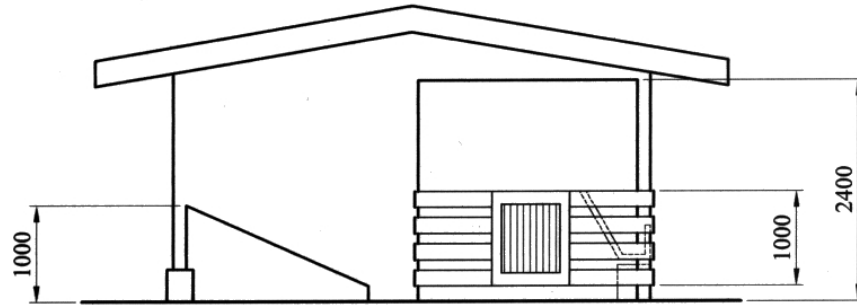
8.6.4 If barbed wire is used as fencing material, it should be only utilized beyond the half-meter line of the fence.

9 Waste disposal

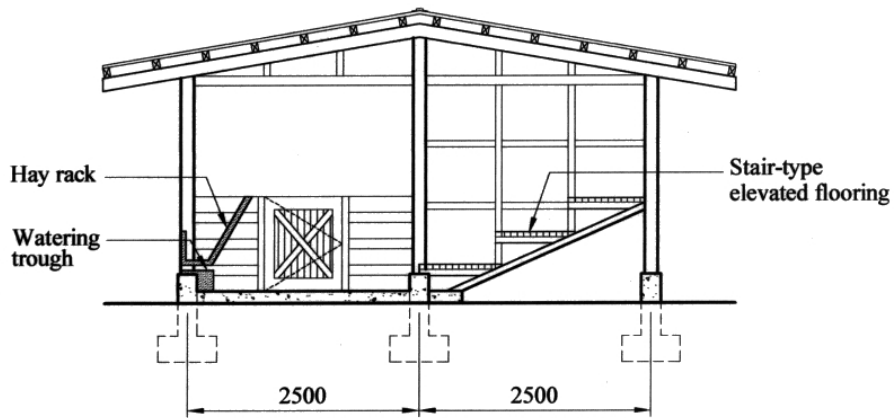
For waste management, refer to PAES 414:2002 Agricultural Structures – Waste Management Structures.

Annex A
(informative)

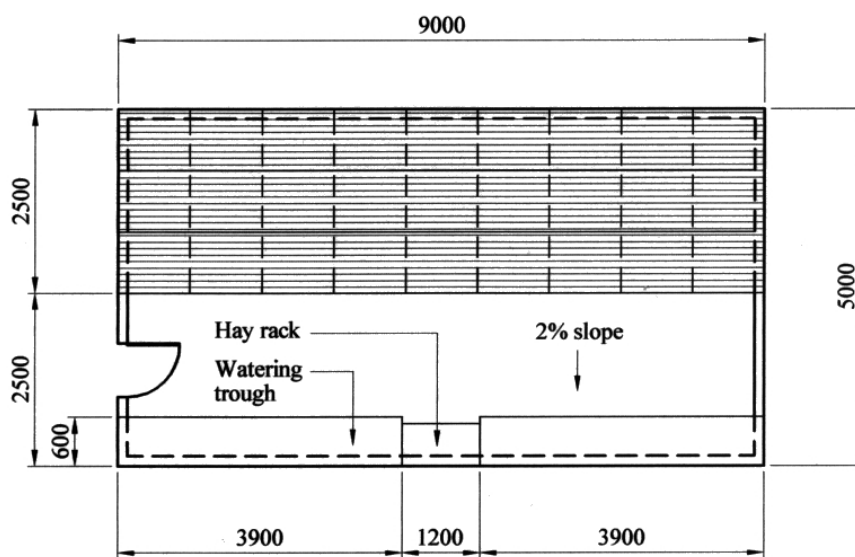
Typical layout of a pen-barn type housing



Side Elevation



Cross Section



Floor Plan

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