

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 broiler 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 formulation of this standard reference were made to:

Animal Husbandry and Agricultural Journal. Poultry Raising, Know the tips. August, 1993.

Barre, H. J. and L. L. Sammet. Farm Structures. John Wiley and Sons, 1950.

Batty, J. and Mrs. M. Batty. Poultry Houses and Appliances. Spur Publications Company, 1976

Card, L. E. and M. C. Nesheim, Poultry Production. LEA and FEBIGER, Philadelphia, 11th edition..

Dougherty, J. E. and H. L. Belton. Poultry Houses and Equipment, Buletin # 476, University of California, Agricultural Experiment Station. 1940.

Esmay, M. L. and Dixon, John E. Environmental Control for Agricultural Buildings.

HSUS Recommended Humane Standards for raising Livestock and Poultry.

North, M. O. and D. D. Bell. Commercial Chicken Production Manual. Chapman and Hall, New York. 4th edition, 1990.

PCARRD, Philippine Recommends for Broiler Production.

Price, C. J. and J. E. Reed. Poultry Husbandry II, Notes for Students of Animal Husbandry, UNDP – FAO, 1971.

Agricultural Structures – Housing for Broiler Production

1 Scope

This standard specifies the minimum requirements for broiler production. 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 Structures

3 Definitions

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

3.1**brooder guard**

materials that are placed around the brooder stoves to prevent the chicks from straying too far away from the heat supply until they learn the source of heat

3.2**brooding**

process of supplying heat to the chicks after hatching up to the time that their natural heat regulatory mechanisms becomes fully functional

3.3**litter**

material used as bedding for animals

3.4**open-sided housing**

long and narrow type of houses wherein at least one-half of the front and the back of the house are open

3.5**enclosed housing**

house wherein inside conditions are maintained as near as possible to the bird's optimum requirements with the use of mechanical ventilation and artificial lighting

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 of broiler house

- 5.1 According to type of roof
- 5.1.1 Lean-to-roof
- 5.1.2 Span/Ridged roof
- 5.2 According to type of floor
- 5.2.1 Slotted floor
- 5.2.2 Solid floor
- 5.2.2.1 Litter-type floor
- 5.2.2.2 Concrete floor with cages
- 5.3 According to type of enclosure
- 5.3.1 Open sided housing
- 5.3.2 Enclosed housing

6 Space requirement

Adequate floor space shall be provided to the broilers. Table 1 shows the minimum floor space requirement for broilers.

Table 1 – Floor space requirements for broiler

Stages	Floor space m²/100 birds
4 weeks and below	6.25
Above 4 weeks old	12.50

7 Structural requirements

7.1 Roof

7.1.1 Roofing material should be made of corrugated G.I. sheets and other durable roofing materials. At least one-meter roof overhang shall be provided to ensure shade and to protect the birds from rain.

7.1.2 Roof structure shall be designed to carry additional dead loads such as suspended feeders.

7.1.3 Roof should be equipped with gutters so that rainwater can be drained away separately.

7.2 Ceiling (optional)

Ceiling height shall be at least 2.4 m high.

7.3 Walls

7.3.1 The walls should be made of suitable materials such as chicken wire or bamboo slats.

7.3.2 There should be provision to protect young chicks and older birds during periods of cold weather and extreme winds.

7.4 Door

7.4.1 Entrance doors shall be at least 900 mm wide by 2 m high and shall be made to swing inward. It shall be covered with 25 mm mesh wire netting.

7.4.2 Doors between pens shall be hung in pairs and be made to swing in both direction so that feed and litter carriers can be pushed through from either direction.

7.5 Floors

7.5.1 Slotted floor

7.5.1.1 The width of the slat shall be 25 mm - 50 mm and the space in between slats shall be 25 mm – 38 mm. On top of the slats, plastic net or fish net with 25 mm holes shall be used.

7.5.1.2 If welded wire is used. It should have 625 mm² mesh. The wire shall be supported every 300 mm.

7.5.1.3 Slats or wire floors shall be constructed in sections so that they may be removed when it is necessary to clean the droppings from under them, or when the house is cleaned.

7.5.1.4 The floor shall be elevated at least 900 mm from the ground and the posts should have a diameter of at least 200 mm.

7.5.2 Litter-type floor

7.5.2.1 Litter material shall be at least 50 mm - 100 mm deep over the cemented floor. Around the cemented floor, there should be solid wall with a height of 600 mm to retain the litter.

7.5.2.2 The litter material shall be:

- light in weight
- have a medium particle size
- highly absorbent
- dry rapidly
- soft and compressible
- low thermal conductivity
- inexpensive

7.5.3 Floor support shall be designed to carry concentrated loads such as the maximum total weight of the birds.

8 Functional requirements

8.1 Housing sizes

8.1.1 Width of the pen shall be about 10 m - 12 m.

8.1.2 The length of the house shall depend on the terrain of the land and on the length of the automatic feeding equipment.

8.2 Brooding area

8.2.1 The area shall be surrounded with cardboard, metal sheeting or any hard board with a minimum height of 450 mm to protect the chicken from draught.

8.2.2 Artificial light

8.2.2.1 During the first 48 hours, chicks shall receive a total of 23 hours of light at 35 watt/m² of illumination. This amount should be supplied by approximately 3.5 watts of light bulb for each 0.37 m² of floor space when the bulb is approximately 2.4 m above the floor and under a good clean reflector.

8.2.2.2 After the first 48 hours, the intensity of light shall be reduced. At floor level it should be about 10 watt/m². Provide approximately 1 watt of bulb, at 2.4 m above the floor, and under a good and clean reflector for every 0.40 m² of floor space.

8.2.2.3 The height of hover type brooder shall be adjustable. Hovers shall be maintained at a minimum clearance of 120 mm above the back of the birds.

8.2.2.4 Proper temperature inside the brooding area shall be maintained to make the chicks feel comfortable. The range of temperature ideal at various ages of broiler chicks is shown in Table 2.

Table 2 – Recommended brooding temperature

Age of chicks days	Temperature °C
1 – 7	32 - 35
8 – 14	29 – 32
14 – 21	27 – 29
Beyond 21 days	Provide heat only when necessary

8.2.2.5 Thermometers shall be placed in strategic locations inside the poultry house in order to monitor the temperature.

8.2.2.6 Temperature in the poultry house shall not be permitted to become higher than the outside temperature during summertime. Temperature should be lowered by providing additional water troughs, roof sprinklers, foggers and fans.

8.3 Aisles and Walkways

Aisles and walkways between doors walls shall be at least 1 m wide.

8.4 Equipment and Facilities

8.4.1 Feeders

8.4.1.1 The recommended feeder length for broilers is shown in Table 3.

8.4.1.2 Each feeding trough should have a guard or lip about 10 mm - 20 mm to prevent the feed from being scratched out or beaked out onto the floor. It should be provided with wire bars or grills to prevent scratching and billing (Figure 1).

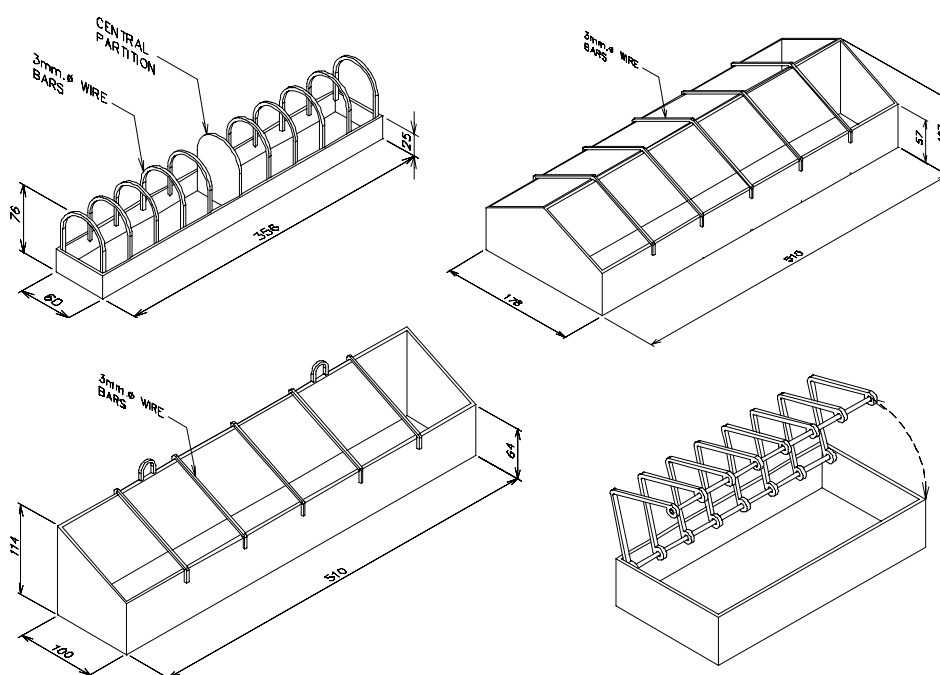


Figure 1 – Typical design of feed trough

8.4.1.3 Round feeders should be provided with adjustable slots to control feed flow (Figure 2). Edges of feeder pan should be rolled for safety.

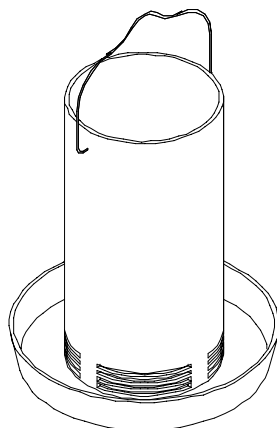


Figure 2 – Typical design of round feeder

8.4.1.4 As the flock grows, feeders shall be raised to maintain the feed level at the same height as the back of the chickens.

Table 3 – Feeder length requirement

Stages	Feeder	
	Linear ^a m/100 birds	Round ^b pieces./100 birds
4 weeks and below	4	4
Above 4 weeks old	7.5	5
^a If both sides of a linear feeder is available to the birds, count each side when figuring available space. ^b 305 mm diameter pan.		

8.4.2 Waterer

8.4.2.1 For every 100 chicks, two fount-type chick waterers shall be provided for the first 2 weeks. Waterers shall be placed outside the edge of the hover. After two days the founts shall be placed on stands about 25 mm high. Each waterer shall hold approximately 3.6 liters of water. Table 4 shows the minimum water space requirement.

Table 4 – Waterer length requirement

Stages	Feeder	
	Linear ^a m/100 birds	Round pieces./100 birds
4 weeks and below	2.5	1
Above 4 weeks old	4	1
^a If both sides of a linear waterer is available to the birds, count each side when figuring available space.		

8.4.2.2 To facilitate cleaning, the shape and size of the waterers should be semi-circular and fairly wide and supported by an adjustable bracket to permit easier adjustment. It may have a removable stopper at the drainage end to allow easier cleaning.

8.4.2.3 Waterers should be spaced uniformly throughout the house. No bird shall have to go over 3 m to drink water.

8.5 Lighting

Artificial lighting with an intensity of 200 lux (refer to Annex B) shall always be available for use during the night or darkened periods of the day. All electrical design and installation shall conform to Philippine Electrical Code.

8.6 Ventilation

8.6.1 Natural ventilation

8.6.1.1 Outlets should be either ridge or chimney opening on the downwind side of the building. It should be preferably located at the highest point in a building.

8.6.1.2 Inlets should be through vent doors, curtains or other large openings along the long sides of the building.

8.6.1.3 If necessary, automatic controls should be provided to maintain the indoor temperature and provide air exchange as weather changes hourly and seasonally. Natural ventilation system controllers should be available to regulate air exchange by adjusting inlet and outlet opening sizes. Various devices should be used to adjust the opening size: pneumatic systems; either manual or motorized cable and winch systems; and motorized mechanical arms.

8.6.2 Mechanical ventilation (if necessary)

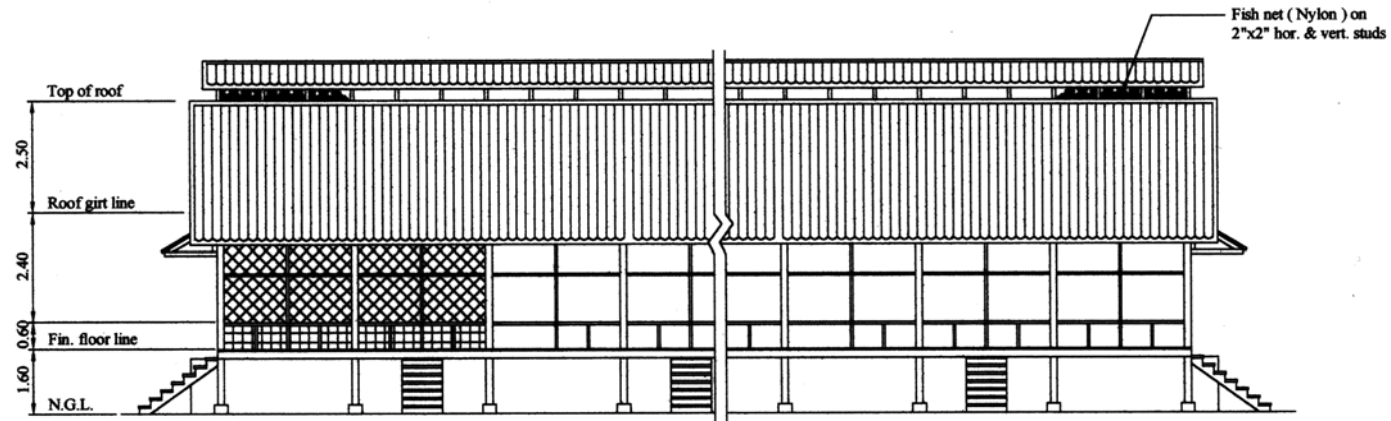
Fans should be installed on the side opposite to the prevailing winds.

9 Waste disposal

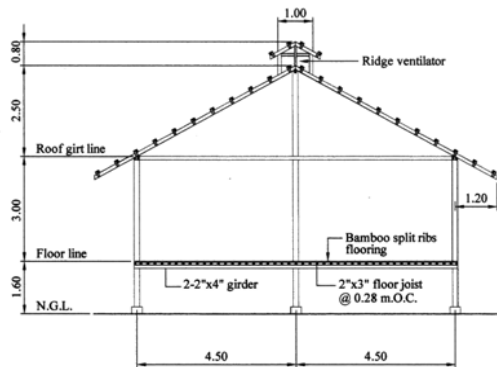
For waste management, refer to PAES 414:2002 Agricultural Structures – Waste Management Structures.

Annex A
(informative)

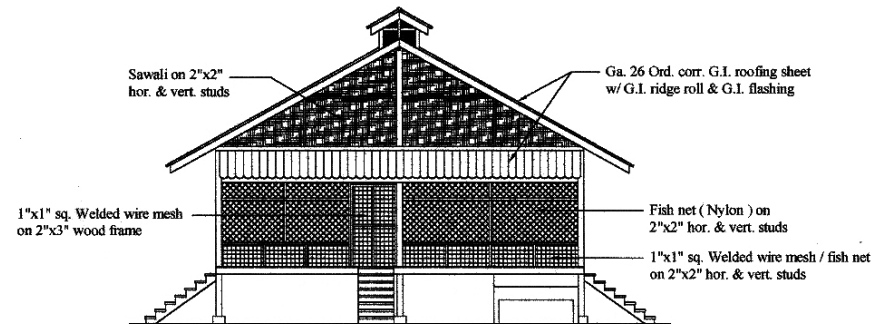
Sample Design of Broiler House



Typical Side Elevation
Scale 1 : 100 Meter



Cross Section
Scale 1 : 100 Meter



Typical Front / Rear Elevation
Scale 1 : 100 Meter

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