

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 was reviewed by the Technical Committee for Study 3 – Development of Standards for Agricultural Structures and was circulated to various private and government agencies/organizations concerned for their comments and reactions. This standard was presented to the Philippine Society of Agricultural Engineers (PSAE) and subjected to a public hearing organized by the National Agriculture and Fisheries Council (NAFC). The comments and reactions received during the presentation and public hearing were taken into consideration in the finalization of this standard.

This standard has been technically formulated in accordance with PNS 01: Part 4:1998 – Rules for the Structure and Drafting of Philippine National Standards. This standard provides the general requirements for the construction of slaughterhouse for swine, small and large animals.

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

Abattoirs Act, 1988 (Abattoirs) Regulations. Northern Ireland, 1989.

Abattoirs. Environment Protection Authority, Australia, 1995.

Abattoirs Designs and Design Concepts for ASEAN. ASEAN Food Handling Bureau. Malaysia, 1981.

Grandin, T. Improving Animal Movement, updated July, 2000.

Meat Hygiene, 9th ed. London, 1992.

Meat Hygiene, Inspection and Preservation. NMIC. January, 1977.

Meat Manual of Procedure. Canadian Food Inspection Agency.

Operational Guidelines for the Welfare of Animals at Abattoirs and Slaughterhouses, 2nd ed. Canberra, 1995.

Agricultural Structures - Slaughterhouse for Swine, Small and Large Animals

1 Scope

This standard specifies the general requirements of slaughterhouse for swine, and for large and small animals. This standard shall:

- 1.1** provide physical separation between clean and unclean operation in slaughterhouse,
- 1.2** provide the essential general, structural and functional requirements in slaughtering process,
- 1.3** provide the proper slaughtering procedure,
- 1.4** provide protection and convenience for the slaughterhouse personnel, and
- 1.5** provide the general criteria for slaughterhouse design.

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 Structures

3 Definitions

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

3.1**slaughterhouse**

any building or place used for killing of animals where the flesh is intended for human consumption, typical situation and floor plan of a slaughterhouse is illustrated in Annex A

3.2**stunning pen**

compartment which is suitable for confining only one animal at a time while it is being stunned and which is so constructed as to confine, without discomfort, to prevent any substantial movement of the animal forward, backward or sideway

3.3**stunning**

renders an animal insensible before it is killed

3.4

pithing

insertion of a rod or coiled wire through the hole in the skull of cattle made by the captive blot to destroy the brain and spinal cord to prevent reflex muscular action and possible injury to operatives

3.5

sticking

severance of the major blood vessels in the neck or immediately anterior to the heart by means of a knife and “stuck” shall be construed accordingly.

3.6

bleeding

remove as much blood from the carcass as possible before further handling

3.7

scalding

lowering of animal into steam to prepare skin for dehairing

3.8

dehairing

removal of the hair of the carcass

3.9

gambrelling

suspending the carcass for particular operation

3.10

singeing

cleaning the carcass by burning the hair

3.11

evisceration

process of removing the internal organs in the abdominal and thoracic cavities

3.12

dressng

preparation of carcass after evisceration, ready for storage or sale

3.13

splitting

dividing carcass into parts

3.14

carcass

all parts including viscera of slaughtered cattle, sheep, goats or swine that may be used for human consumption

3.15

meat

edible part of the muscle of cattle, sheep, goats or swine

3.16

offal

part of internal organs of a slaughtered animal

3.16.1

green offal

digestive tract of ruminants such as the stomach, or the intestines which still contain fecal matter

3.16.2

black offal

digestive tract of swine such as the stomach, or the intestines which still contain fecal matter

3.17

detained meat

meat requiring further examination as declared by a veterinary inspector after veterinary examination

3.18

condemned meat

meat which is unfit for human consumption as declared by a veterinary inspector after veterinary examination

3.19

gut and tripe

black or green offal

4 Classification

4.1 "A" slaughterhouse

slaughterhouse with required facilities and operational procedures to serve local markets in the community (Figure 1)

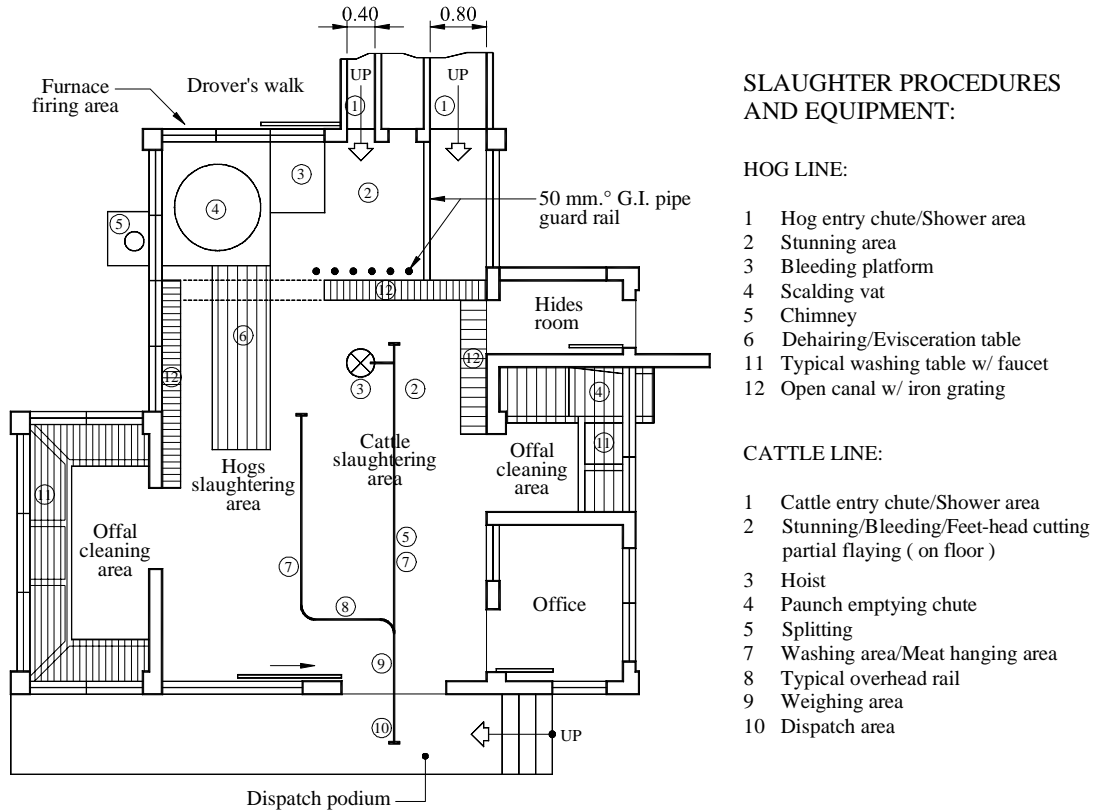


Figure 1 – Typical floor plan and procedures for a class A slaughterhouse

4.2 “AA” slaughterhouse
slaughterhouse with required facilities and operational procedures to serve local markets within the country (Figure 2)

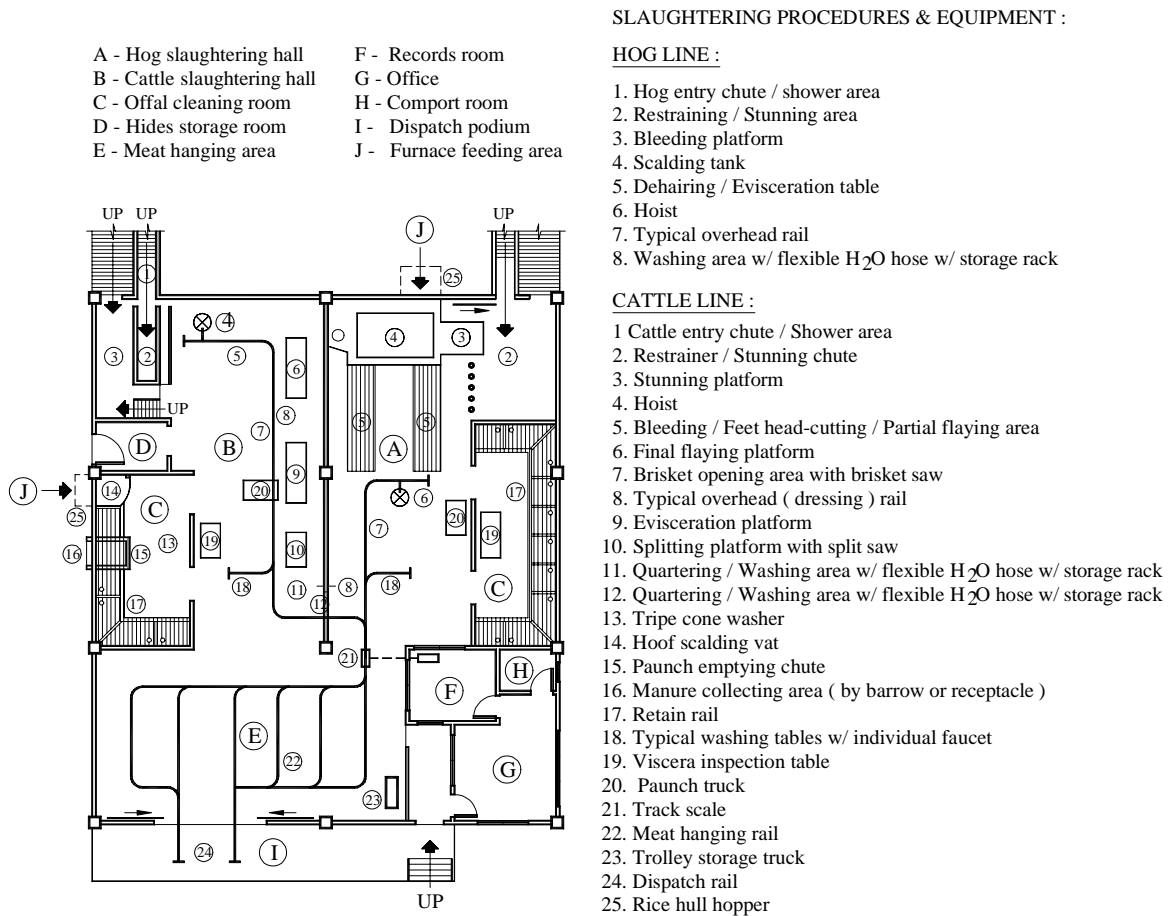


Figure 2 – Typical floor plan and procedures for a class AA slaughterhouse

4.3 “AAA” slaughterhouse

slaughterhouse with required facilities and operational procedures to serve any market (Figure 3)

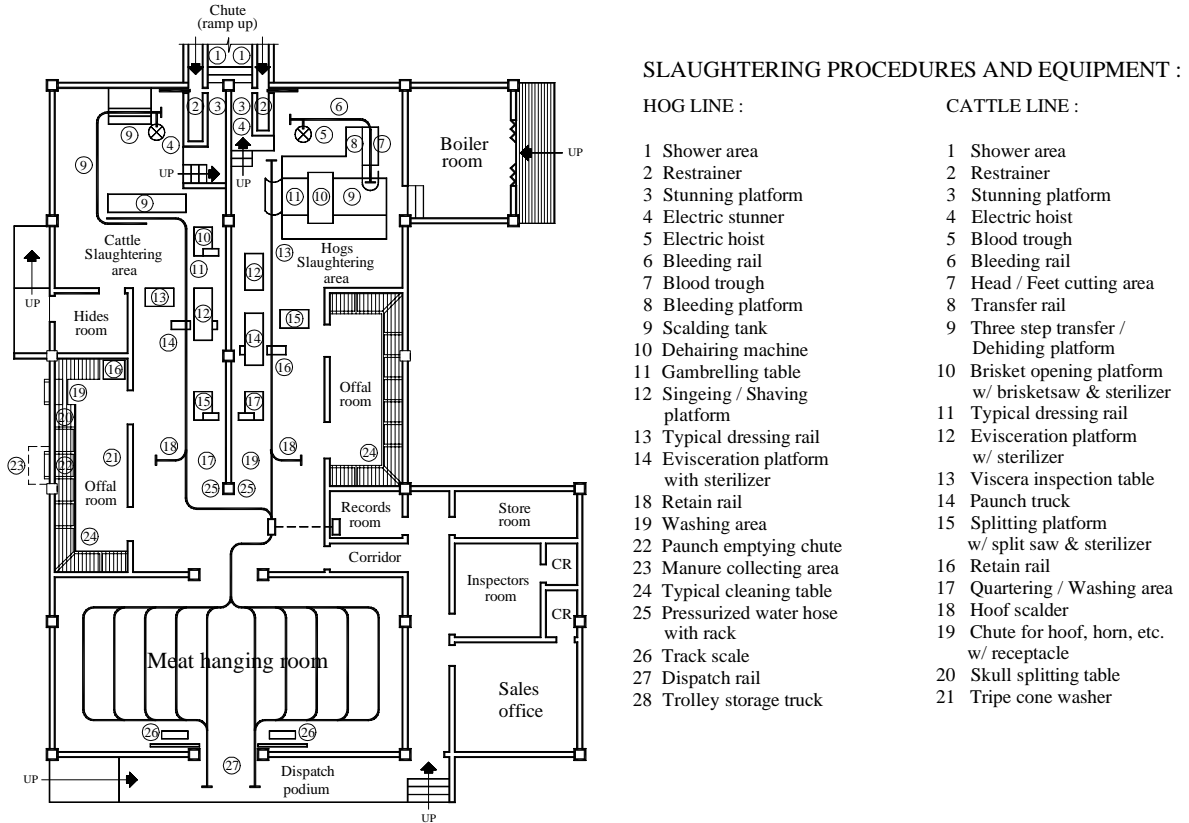


Figure 3 – Typical floor plan and procedures for a class AAA slaughterhouse

5 Location

- 5.1** The site shall be on a higher level than its surroundings.
- 5.2** The slope, terrain, foundation and soil conditions on the site shall be suitable for the construction of substantial, and permanent buildings.
- 5.3** The site shall be located far from any building used for human habitation, and from any factory, public road or public place (at least 200 meters) and should be free from dust, odor, smoke, and other contaminants.
- 5.4** The site shall not be located adjacent to the public market areas.
- 5.5** If possible, it shall be located near livestock production areas.
- 5.6** If located near a river, stream, or lake, the slaughterhouse shall be at least 10 meters away from the bank.
- 5.7** The site shall have a continuous water supply to meet the required amount of water.
- 5.8** The site shall be dry and well drained.
- 5.9** The site shall be suitable for the adequate disposal of solid and liquid waste.
- 5.10** Adequate sources of energy shall be available at the site. Electric wiring and installations shall be enclosed in suitable trunking or casing that conform with the national electric code.
- 5.11** Transport to and from the slaughterhouse shall be accessible.
- 5.12** The site shall be fenced.
- 5.13** The area immediately surrounding the slaughterhouse shall be concreted or covered with asphalt or a similar material. The access road shall be similarly treated.
- 5.14** There shall be sufficient space for possible future expansion.

6 Space requirements

The minimum area for slaughterhouse of the following types shall be as follows:

Table 1 – Recommended dimension for slaughterhouse based on throughput

Animals	Throughput (animals/day)	Dimension (in meters)
Large animals or (small animals)	2 (10)	8.6 x 5.8
	30 (150)	12.5 x 6.4
	60 (150-350)	23.3 x 15
Swine	200	53 x 21.5
	30	8 x 5
	120	12 x 5
	400	19.4 x 8.4

7 Structural requirements

7.1 Foundation

7.1.1 The site shall be elevated to at least 600 mm above the adjacent ground (Figure 4). The fill material shall be compacted thoroughly by rolling or pounding.

7.1.2 Structural footing design shall conform with the existing national building code.

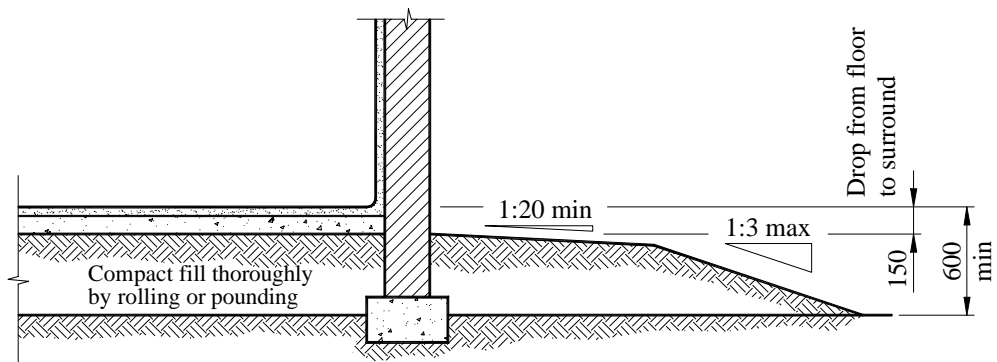


Figure 4 – Foundation of a slaughterhouse

7.2 Floors

7.2.1 Base slab shall be made of concrete (150 mm thick) reinforced with 10 mm rods both ways with spacing of 200 mm or it shall be reinforced with equivalent welded mesh.

7.2.2 It should be made of strong concrete topping (40 mm minimum thickness), or granolithic concrete, or unglazed tiles (ceramic, quarry, cast iron or polymers).

7.2.3 It shall be structurally sound and resistant to cracking, chipping and flaking, impact resistant, easy to clean, and impervious to moisture.

7.2.4 The minimum floor slope shall be one degree. Floor shall slope uniformly to drain inlets with no low spots.

7.3 Walls

7.3.1 Internal wall surfaces shall be durable, easy to clean, rust resistant, and impact resistant or protected from impact by guards (Figure 5).

7.3.2 It should be made of either concrete, granolithic concrete, or tiles (ceramic, quarry, steel-surfaced, cast iron or polymers). Joints between tiles shall be filled with solid mortar backing and cement.

7.3.3 Both exterior and internal wall shall be smoothly finished and impervious to liquids (up to 1.8 m), not readily subjected to chipping or flaking, and sealed at joints.

7.3.4 All wall tops and ledges shall slope at 45°.

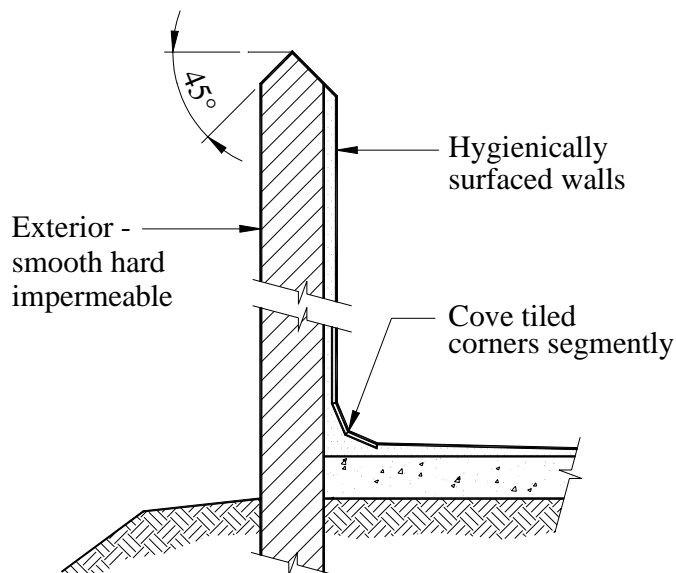


Figure 5 – Finishing of a slaughterhouse wall

7.3.5 It shall be coved to the floor-wall and at wall-to-wall junctions with a minimum radius of 50 mm.

7.3.6 Internal walls where carcasses are processed shall not be painted.

7.4 Roof

7.4.1 The roof structure should be made of timber, dressed and oiled but not painted or galvanized steel (Figure 6).

7.4.2 Roofing materials should be made of aluminum, galvanized steel and other forms of steel sheeting with corrosion resistant coatings.

7.4.3 There shall be provisions for skylights and plastic roofing sheets at strategic locations for natural light.

7.4.4 Roof vents, when provided, shall be properly screened.

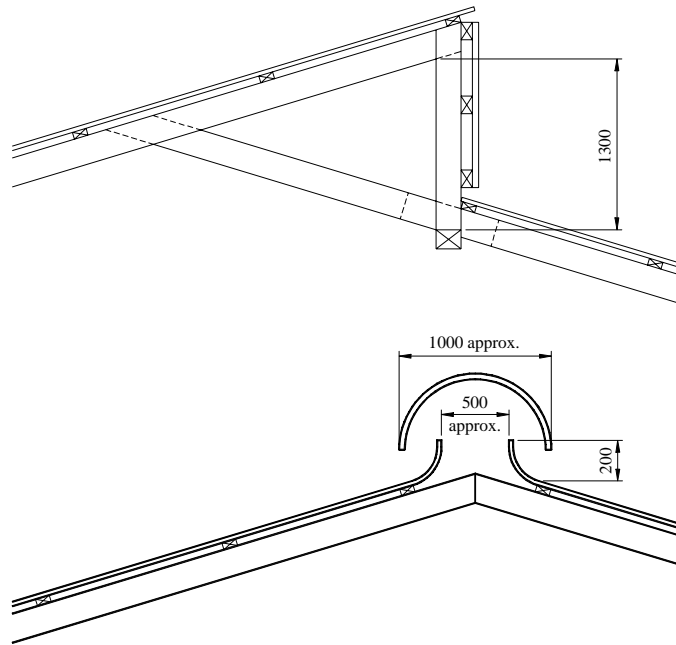


Figure 6 – Types of roof for slaughterhouse

7.5 Ceilings

7.5.1 Ceilings shall be at least 3 m from the floor.

7.5.2 Ceiling should be made up of aluminum roof sheet or color-bonded galvanized steel sheet.

7.5.3 If ceiling is made up of interlocking, rust resisting metal sheet, such as heavy gauge, heavy duty, galvanized steel, anodized aluminum or stainless steel, it shall be fastened to a metal structure by acceptable means.

7.5.4 If an open joist ceiling is employed, the joist shall be treated to prevent rusting and corrosion, and with a minimum center spacing of 900 mm.

7.6 Windows

7.6.1 If windows are necessary, it shall be screened and shall be at least 1.0 m above the floor.

7.6.2 Window sills shall be sloped at 45°.

7.7 Doors and Jambs

7.7.1 Doorways shall be at least 1.5 m wide.

7.7.2 Doors shall be constructed of rust-resistant material. If made of wood, it shall be covered with rust-resistant material and have light soldered or welded seams.

7.7.3 Doors should be either fitted with screens or self closing and snug fitting double action doors. Double-acting doors shall possess a glass (reinforced) panel at eye level.

7.7.4 The doorjambs shall be made up of rust-resisting metal.

7.7.5 The juncture between the wall and the doorjambs shall be effectively sealed with a flexible sealing compound.

7.8 Columns

Columns or other structural members located in areas where product contact may occur shall be constructed from, or sheathed in, durable, non-porous, easily washable material.

7.9 Drainage

7.9.1 Drainage and plumbing system for the slaughterhouse shall be in accordance with the National Plumbing Code. It shall collect all liquid wastes incidental to the operation and properly connected to an approved sewage treatment and disposal system or to the municipal sewerage system.

7.9.2 Inlet

7.9.2.1 One drain inlet shall be provided for each 40 m² of floor space. If the area has high water discharged, the number of drain inlets and their size shall be increased.

7.9.2.2 Drain inlets shall be at least 300 x 300 mm. It shall be provided with drain covers with apertures having a minimum size of 400 mm².

7.9.3 Drainage line

7.9.3.1 The lines shall be watertight and have adequate traps and vents and shall be made of cast or galvanized iron pipe.

7.9.3.2 Drainage pipes (cast iron or concrete) for ruminal contents shall be at least 20 cm in diameter. In the case of stomach contents in swine, the pipe diameter shall be at least 15 cm in diameter.

7.9.3.3 The drainage shall be valley type drains, if it is an integral part of the floor. Drains shall also be made up of gutter and channel drains if constructed of precast metal, vitreous tile or the like, and covered with removable sectional grated covers. The sections of the covers shall not be longer than 1.2 m.

7.9.3.4 Drainage pipe shall be discharged into a sump from which the materials shall be transferred to an elevated tank for dewatering. The capacity of the dewatering tank shall be based on the maximum number of animals to be slaughtered daily at 0.014 m³ per head.

7.9.3.5 Drains shall be provided with a deep seal trap (P, U, S-shape) and rodent screens (127 mm).

7.9.3.6 Screw plugs shall be provided where water seal may evaporate in the traps.

7.9.3.7 All drainage outlets shall be trapped and fitted with suitable metal grids.

7.9.4 Grease catch basin

7.9.4.1 The grease catch basin shall not be constructed near the area where meat and edible offals are handled.

7.9.4.2 The catch basin shall be open and shall be accessible to daily cleaning. The grease skimmed from the basin shall be placed in watertight containers and shall promptly removed from the plant.

7.9.4.3 All catch basins, grease traps, interceptors and other means of separating organic matter from the slaughterhouse shall be located in the inedible section of the establishment or outside the building. Refer to PAES 414:2001 Agricultural Structures - Waste Management for waste management structures.

7.9.4.4 The area surrounding an outside basin shall have an impervious surface and shall be sloped towards the catch basin.

7.9.4.5 Grease and sedimentation traps, if use, shall be fitted with baffles and screens.

7.9.5 Where appropriate, a properly constructed, easily cleanable screening chamber or sump of adequate capacity and located in the open shall be provided in the drainage system.

7.9.6 Air-intake and venting pipes to the drainage system shall not be located inside the slaughterhouse building.

7.9.7 The paunch and stomach contents line shall not be connected to the regular drainage line of the slaughterhouse.

7.9.8 Floor drainage from unclean area or rooms shall not drain into clean areas or room. There shall be provisions for separate drained rooms or areas where handtrucks, box trays and other equipment are washed and cleaned.

7.9.9 Separate drainage from the slaughterhouse drainage lines shall be provided for the comfort rooms and urinals.

7.9.10 Drainage facilities shall be maintained in good condition and state of repair.

7.9.11 All drainage lines shall be connected to evaporation pan.

8 Functional requirements

8.1 Pre-slaughter pen

8.1.1 For swine and small animals, a pre-slaughter pen contiguous to the stunning area shall be provided.

8.1.2 Pens shall be made of concrete, masonry or metal construction.

8.2 Stunning area

8.2.1 Stunning boxes or v-shaped restrainer-conveyors should be provided.

8.2.2 There shall be provision of a suitably placed bright light or other means of attracting the animal's attention.

8.2.3 The area in front of the stunning pen shall be at least 3 m in width to the opposing wall or bleeding trough and be fitted with upright bars (50 mm in diameter) spaced at 400 mm in intervals to a height of at least 1.2 m.

8.2.4 A dry landing area shall be provided in front of the stunning box with a raised sturdy frame of expanded metal.

8.2.5 For large animals, provisions shall be made for the convenient holding of instruments of stunning (captive bolt pistols, ammunition, and electrolethaler tongs), and shackles for hoisting the animals.

8.2.6 Illumination of 220 lux shall be provided.

8.3 Sticking and Bleeding area

8.3.1 Bleeding area shall be curbed and steeply graded to the blood and wash-up open drains that directly leads to an underground blood tank. Detailed specification and construction of a typical blood drain and blood is shown Figure 7 and 8. Blood tank shall be provided with air duct. If the blood is to be collected, rust-resistant buckets should be used.

8.3.2 The minimum diameter of the blood drain shall be 150 mm and shall be sloped not less than 170 mm per meter to the discharge point.

8.3.3 The bleeding trough for large animals shall be at least 1.5 m wide and 1.1 – 1.2 m for small animals and swine. It be enclosed on both sides and shall have a smooth impervious surface such as stainless steel.

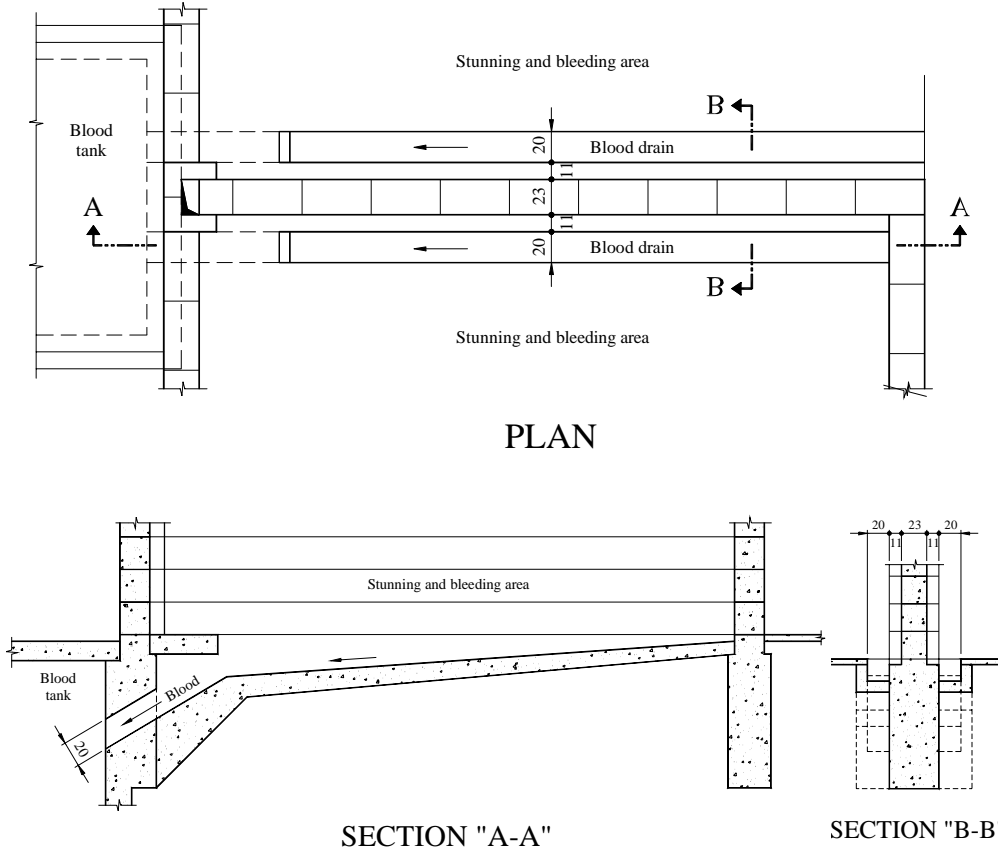


Figure 7 – Cross section of a typical blood drain

8.3.4 For small stock bleeding area, galvanized steel or aluminum grating shall be provided.

8.3.5 For large animals, the overhead bleeding rail shall conform with Table 2.

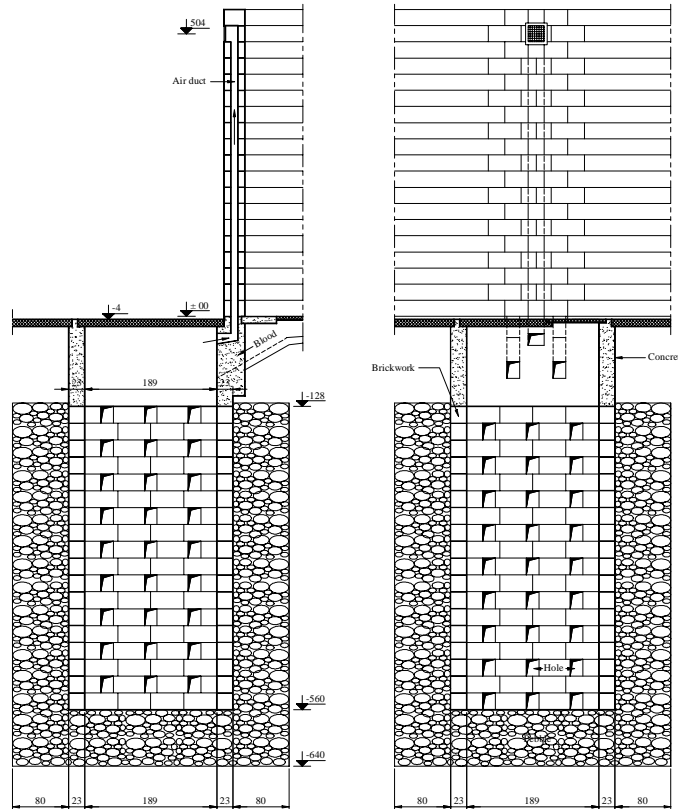


Figure 8 – Cross section of a typical blood tank.

Table 2 – Minimum distance from the carcass suspension contact point to the floor

Animals	Distance (m)
Cattle	3.7
Calves	2.7
Sheep & Goat	2.4
Swine	2.6

8.4 Boiler room

A room shall be provided for supplying hot water with temperature of 80°C. It should be equipped with heating facilities.

8.5 Dressing area

8.5.1 Inspection stations in the dressing area should be provided with an illumination of 540 lux.

8.5.2 A rail stop button with a suitable sound system (e.g. bell or buzzer) shall be provided to the inspector at the viscera inspection station.

8.5.3 Stationary or elevating type platforms shall be located away from the dressing rail. It shall be provided with rust-resistant protective.

8.5.4 Equipment sanitizing units, handwashing facilities, drinking fountains, hot and cold water outlets shall be provided.

8.5.5 In the dressing of calves, sufficient space and facilities shall be provided for the soaking, scrubbing and cleaning of calf carcasses.

8.5.6 Sufficient space shall be provided for the dehorning, removal and thorough washing of heads.

8.5.7 The swine scalding tank and dehairing equipment shall be separated from the rest of the dressing area. The scalding tank shall be equipped with overflow facilities.

8.5.8 For a slaughterhouse with a slaughtering cattle rate of 25 or more per hour or 150 swine or more per hour, shall be provided with a moving top evisceration table which shall:

8.5.8.1 be provided with cold water sprays to remove blood and extraneous material,

8.5.8.2 have a properly vented sanitizing compartment located at the ascending end of the conveyor. The sanitizing compartment shall be equipped with dial-type thermometer which is visible to the inspection staff. Water in the sanitizing compartment shall be maintained at a minimum temperature of 82° C,

8.5.8.3 be synchronized with the eviscerating rail, but it shall be possible to stop and start the moving top table and the eviscerating rail separately,

8.5.8.4 provide access to the facilities for the cleaning and disinfection of eviscerator's hands, arms, boots, aprons and equipment.

8.5.8.5 footstands for eviscerators shall not be installed over the moving surface, and

8.5.8.6 be installed together with facilities that provide for the systematic removal of all organs and parts which passed for human consumption or for use as animal food. Only condemned material and other inedible material shall be discharged at the terminal end of the flights of the moving top evisceration table.

8.5.9 Facilities such as racks, or trays, or equivalent means shall be provided to accommodate and maintain the identity of the organs and parts detained for veterinary diagnosis.

8.5.10 There shall be provision for rails and rail support system. The rails and rail supporting structures shall be easy to clean and shall be constructed from rust-resistant materials.

8.5.10.1 The supporting suspension structures shall be free from loose material.

8.5.10.2 Surfaces of supporting beams for rails shall be free from crevices. If there are interchannel spaces, it shall be closed with rust resistant, smooth metal sheeting or by filling the space with an accepted material.

8.5.10.3 The rail height shall conform to Table 3.

Table 3 - Minimum distance from the carcass suspension contact point to the floor

Animals	Distance (m)
Cattle	3.1
Calves	2.4
Sheep & goats	2.0
Swine	3.1

NOTE When a stand or platform is placed under hanging carcasses, the top of the stand or platform is deemed to be the floor for the above minimum distances.

8.5.11 A check trim station shall be provided at a point prior to the final carcass washing station. This station shall be equipped with an adequate platform and pressure spray washing equipment shall be used.

8.5.12 Trucks or hooded chutes shall be provided for the prompt removal of hides and pelt.

8.6 Gut Room/Tripery

8.6.1 For green offal, a separate area shall be provided for the emptying and cleansing of stomach and intestines and for the preparation of casings tripe or edible fat.

8.6.2 Illumination of 220 lux shall be provided.

8.7 Cutting and boning area

8.7.1 It shall be equipped with refrigeration units capable of maintaining a temperature of 10° C or less.

8.7.2 An adequate number of knife sanitizers shall be provided at strategic locations.

8.7.3 The area shall be provided with illumination of 220 lux.

8.7.4 A re-inspection station shall be provided with handwash facility, a sanitizer unit and a 540 lux illumination.

8.8 Storage

For all storage rooms, an illumination of 110 lux shall be provided.

8.8.1 Hide rooms

A separate room and facilities shall be provided for the storage of hide and skin.

8.8.2 Detained meat room

8.8.2.1 Detained meat room shall be located adjacent to the main slaughter hall inspection points.

8.8.2.2 From this detained meat room, the overhead rail shall be provided that reconnect to the main slaughter line toward chill rooms or condemned meat room.

8.8.2.3 If necessary, chilling accommodation shall be provided.

8.8.2.4 Enclosure and lock shall be provided.

8.8.3 Condemned meat room

8.8.3.1 Adequate space, refrigeration and drainage with durable and lockable containers shall be provided for condemned room.

8.8.3.2 This room shall be provided with only one door located outside of the building and shall be provided with lock.

8.8.3.3 At least two pits for rejected meat shall be provided. Detail of construction is shown for Figure 9.

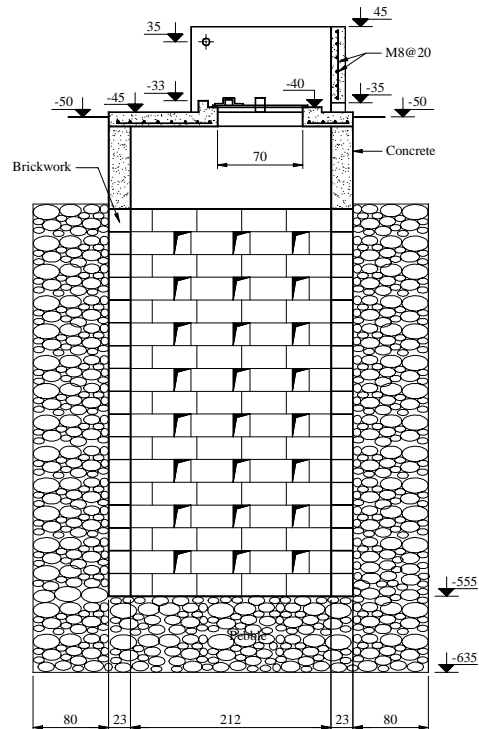


Figure 9 – Cross section of a pit for rejected meat

8.8.4 Cold storage

8.8.4.1 Refrigeration capacity shall be provided to maintain a temperature of 2°C or lower. In holding coolers, a temperature of 4°C or less shall be maintained.

8.8.4.2 An area in the cooler shall be provided for the chilling and storage of detained carcasses and parts. This area shall be segregated from the remainder of the cooler and shall be equipped with seal and lock.

8.8.4.3 Offal shall be stored with an internal temperature of 1°C or less.

8.8.4.4 All blast freezers shall be capable of maintaining temperature of -25°C or lower.

8.8.4.5 Holding freezers shall be capable of maintaining temperatures of -18°C or lower.

8.8.4.6 Provision for measuring relative humidity and temperature shall be provided.

8.8.4.7 Chill doors shall be sliding or single or double-hinged. Internal finishing shall be durable, impervious and with good insulation and floor drainage.

8.8.4.8 Areas of walls where contact with carcasses occurs on loading shall be protected with stainless steel or galvanized/aluminum sheeting.

8.8.4.9 The rail spacing in coolers/freezers shall be 900 mm for beef, 700 mm for pork and 500 mm for lambs, chevon and venison. The minimum space between carcasses on rails shall be 300 – 400 mm. The rail height spacing should conform with Table 4.

Table 4 – Minimum distance from the carcass suspension contact point to the floor

Animals	Distance (m)
Cattle	3.1
Calves	2.4
Sheep & goats	2.0
Swine	2.4*

*When heads are not removed from dressed carcasses 2.7 m distance is required

8.8.4.10 All freezer rooms shall be equipped with thermographs and facilities for securing with locks.

8.8.5 Dry storage room

8.8.5.1 All items shall be stored above the floor on solid or slated shelves, movable dollies or pallets, or in cabinets.

8.8.5.2 Shelves shall be constructed approximately 250 mm from the wall and the bottom shall be 600 mm above the floor.

8.9 Manure area

8.9.1 A room for collection of manure shall be provided for the secure and sanitary collection of manure (Figure 10).

8.9.2 Floors and walls shall be impervious, easily washable, disinfestable and properly drained. The floor shall be at lower level than other floors in the slaughterhouse.

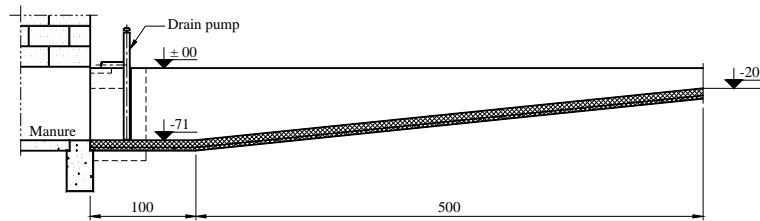
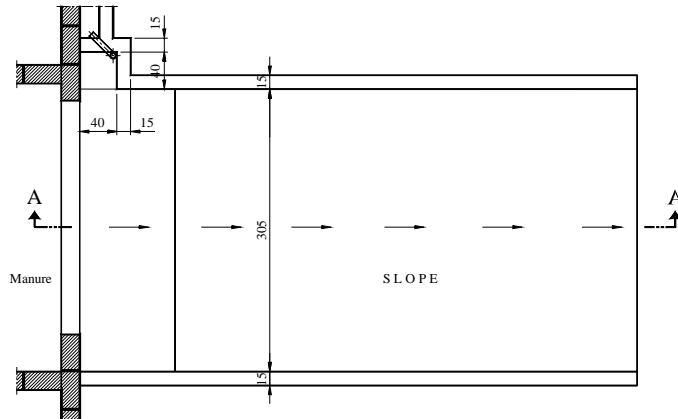


Figure 10 – Cross section of the pathway for manure room

8.9.3 An exit door shall be provided outside the building with a width of 2.5 m.

8.10 Dispatch area

The dispatch area shall be adequate in space and shall allow for the orderly and efficient loading of meat into transport vehicles.

8.11 Personnel area

Access from the meat handling area to the personnel area shall be through a hallway or vestibule. Illumination of 110 lux shall be provided.

8.11.1 Washrooms

8.11.1.1 The construction shall be smooth, hard impervious materials such as glazed tile or smooth, trowelled cement plaster, with properly drained floors.

8.11.1.2 Doors shall be self-closing.

8.11.1.3 Hand lavatories shall be sufficient numbers to meet the needs of the maximum number of employees. Notices shall be posted in prominent places instructing employees to wash their hands immediately after using toilet facilities.

8.11.1.4 Provision for shower facilities shall be provided.

8.11.2 Dressing room

8.11.2.1 Dressing rooms shall be separated from but communicate directly with washrooms.

8.11.2.2 Individual lockers shall be provided for employees. It shall have a 45 degrees slope and have a floor clearance of not less than 350 mm.

8.11.2.3 Elevated, concrete and 150 mm high lockers, with lockers properly anchored and sealed at the base-locker junction can also be used.

8.11.2.4 All lockers shall be made of metal and properly ventilated.

8.11.2.5 Clothes racks with overhead hat racks and suspended boot racks, with 350 – 400 mm floor clearance, and shall be constructed from rust resisting metal.

8.11.3 Mess room

There shall be provision for a separate area for eating.

8.11.4 Inspector's office

8.11.4.1 The minimum office space requirement shall be 11 m² for one inspector and 1.4 m² for each additional inspector.

8.11.4.2 There shall be provision for lockable cabinet, adjoining toilet, washbasin and dressing room facilities.

9 Management practices**9.1** Sanitation

9.1.1 Sterilizers shall be provided for the disinfection of knives, steels, cleavers, saws and other similar implements. The slaughterhouse shall have provision for the cleaning and disinfection of trucks, trolleys, trays, gambrels, hooks, inspection tables, and similar equipment and implements at the end of each working day.

9.1.1 Sterilizers shall be made up of corrosion-resistant materials, easily cleaned, and of sufficient size and number capable of handling all implements and equipment used.

9.1.2 Sterilizers shall be connected to a hot water in adequate amount at temperature of not less than 80°C.

9.1.3 Remote-control (foot, knee activated or timed) hand-washing facilities shall be provided and shall be capable of supplying warm water and directly drained. It shall be located so that personnel can readily wash their hands.

9.1.4 Liquid or other dispensable type of soap, paper towels in suitable dispensers, and receptacles for used towels shall be provided.

9.1.5 Hand-dips utilizing an approved sanitizing agent with rinsing facilities shall

9.2 Noise control

9.2.1 Noise barriers such as screens around noisy equipment and operations shall be provided.

9.2.2 All ventilation and extractor fans shall be fitted with silencers and all ducts shall be lined with sound-absorbent materials.

9.2.3 Diesel forklift engines, other noisy vehicles and air-powered tools shall be fitted with exhaust mufflers.

9.2.4 If slaughterhouse is located near the dwelling or noise sensitive place, perimeter noise barrier walls of 2 – 4 m high and off site noise barrier wall of 3 m high should be provided.

Table 5 – Maximum allowable noise limits (based on background sound levels) for existing sources or places, in dB(A)*

Time Period	Dwelling or noise sensitive place	Commercial place
Daytime	55	70
Night time	45	70

*Measurement shall be taken at noise receptors located outside the slaughterhouse boundary.

9.3 Pest control

9.3.1 Expanded metal or wire with a mesh not exceeding 127 mm shall be embedded in the walls and floor at their junctions.

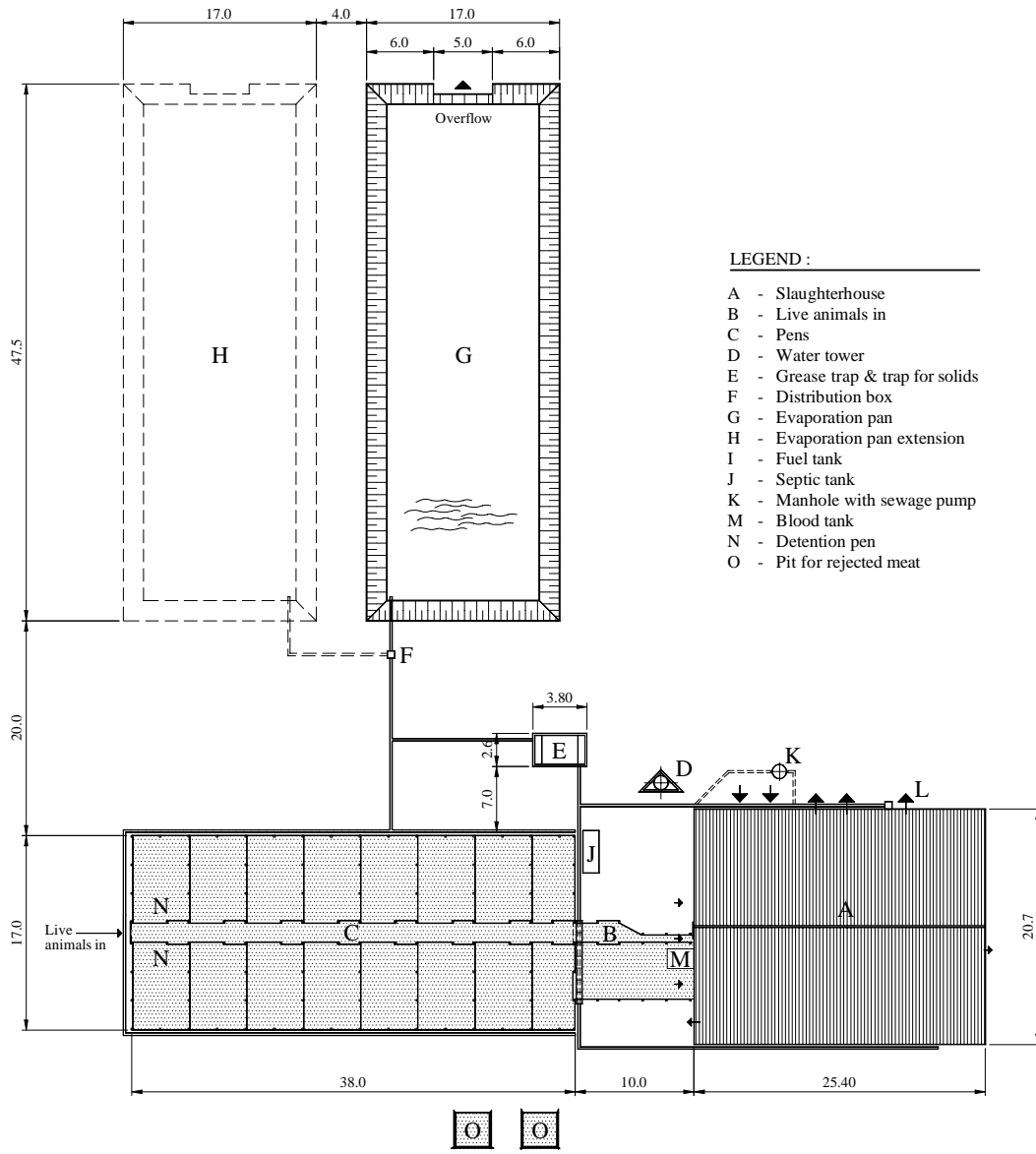
9.3.2 All windows and other exterior openings that could admit insects, birds, bats, etc., shall be equipped with screens. “Fly chaser” fans or other acceptable equivalent devices, shall be provided over outside doorways where screening is not practicable.

9.4 Waste disposal

For waste disposal requirement, refer to PAES 414:2002 Agricultural Structures - Waste Management Structures

**ANNEX A
(Informative)**

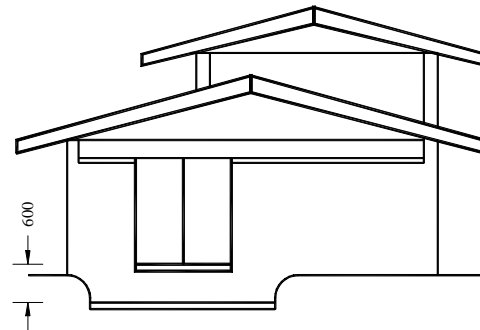
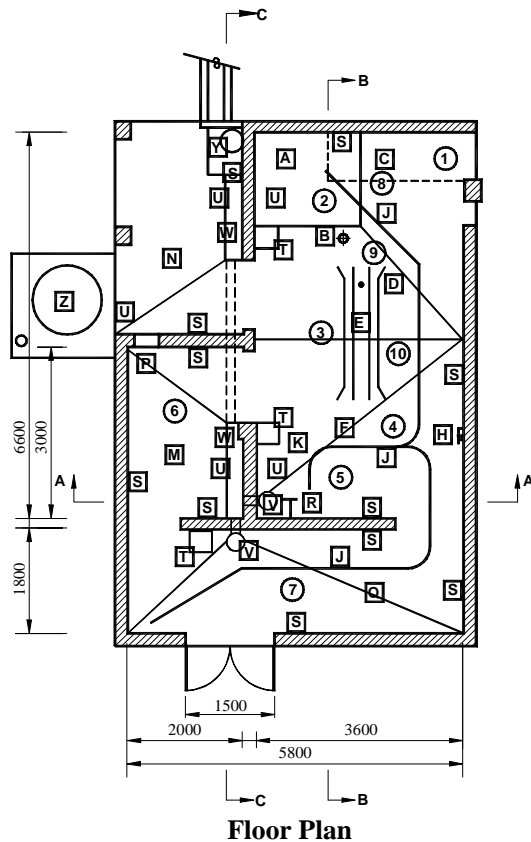
Typical Slaughterhouse Layout



**ANNEX B
(Informative)**

Typical Floor Plan of a Slaughterhouse

B.1 Sample floor plan for 2 large animals/day or 10 small animals/day



Front Elevation

EQUIPMENT & DESCRIPTION

- A Bleeding area and blood drain
- B Casting post
- C Restraining and stunning box
- D Securing pin for dressing bed
- E Dressing bed of gal. or stainless steel pipe
- F Carcass spreader and hoist
- G Hoist support beam
- H Hoist winch
- J Rails – for hanging and moving carcass
- K Carcass washing area
- M Gut washing and offal preparation room
- N Hide, inedible and condemn removal area
- P Inedible outlet and self-closing door
- Q Dispatch room
- R Head and leg wash support hook
- S Hygienically surfaced walls
- T Handwash basin
- U Hose cocks
- V Floor drains
- W Open concrete drain
- Y Blood receiving bucket
- Z Water heating tank

OPERATING PROCEDURE

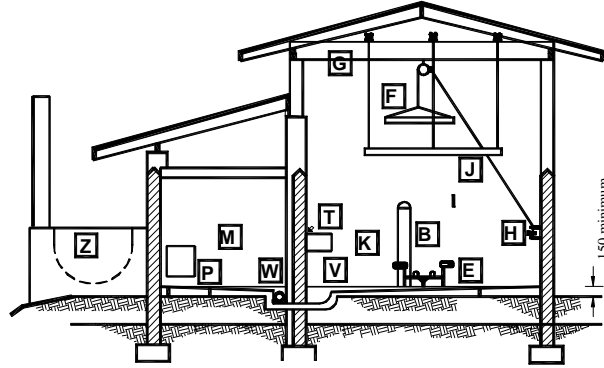
Cattle/Bufaloes

- 1 Bring cattle in – secure and cast, or restrain in box and stun
- 2 Stick and bleed, shackle hind legs to hoist and drag onto dressing bed
- 3 Remove head and feet and hang on rail. Skin, trim and dress head and feet. Remove skin from legs, belly and flanks.
- 4 Hook hind legs to spreader and half hoist. Remove skin from back and take outside. Open and remove viscera to washing room. Split carcass into sides and hoist. Hang forequarters on rail and cut from hind.
- 5 Wash and trim carcass, head and feet.
- 6 Wash and trim offal, empty paunch & wash.
- 7 Hold and dispatch edible products

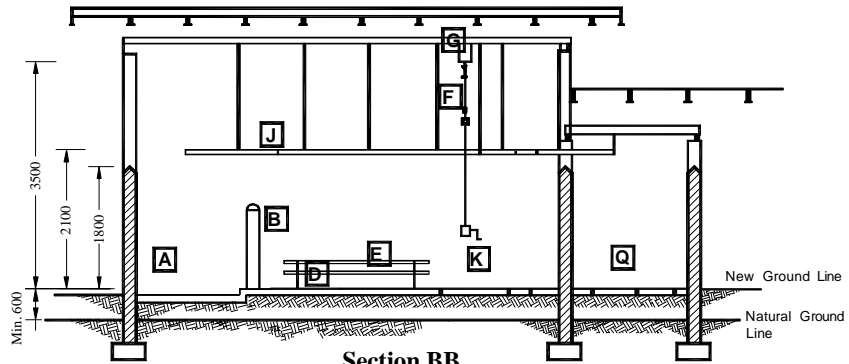
Sheep, Goats and Calves

- 8 Bring in, cast, stick and bleed.
- 9 Lift onto small bed, remove legs, head and open belly.
- 10 Hang on rail. Remove skin from back eviscorate.
- 5,6,7 As for cattle.

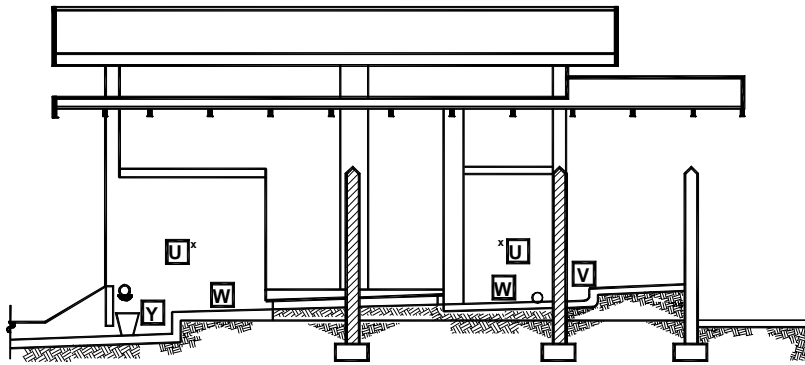
B.2 Sectional view



Section AA



Section BB



Section CC

**ANNEX C
(Informative)**

List of Facilities and Requirements for Slaughterhouse

Slaughterhouse	Facilities	Equipment	Requirements
A	<ul style="list-style-type: none"> a. Lighting and Water b. Holding Pens, corral c. Stunning Area d. Pithing Area e. Head Handling Facilities f. Loading and Unloading Area g. Comfort Rooms h. Condemned Box 	<ul style="list-style-type: none"> a. Scalding Vat b. Dehairing Tables c. Inspection Tables d. Fixed Carcass Hanger/Hoist e. Weighing Scale f. Splitting Axe g. Hose 	<ul style="list-style-type: none"> a. Water Supply b. Meat Delivery Vans c. Waste Water Treatment d. Incinerator e. Perimeter Fence f. Meat Inspector g. DENR Approval (E.C.C.)
AA	facilities in "A" and <ul style="list-style-type: none"> a. Chute b. Bleeding area c. Condemned Room d. Canteen e. Head Handling Facilities f. Inspection Staff Office 	Equipment in "A" and <ul style="list-style-type: none"> a. Stunner b. Electrical Hoist c. Overhead Rails with Rollers, Gambrels d. Blood Trough e. Sterilizers h. Paunch Truck i. Viscera Truck 	Same requirement in "A"
AAA	facilities in "AA" and <ul style="list-style-type: none"> a. Tripery and Guttery Section b. Meat Hanging, Cutting/Deboning and Packing Rooms c. Chiller d. Cold Storage e. Condemned Receptacles f. Retain Rails, Hide and Skin Room g. Boiler h. Laboratory 	Equipment in "AA" and <ul style="list-style-type: none"> a. Restrainer b. Stunning Platform c. Bleeding Platform d. Dehairing Machine/dehiding system e. Gambrelling Platform f. Singeing g. Shaving/Evisceration h. Viscera Inspection Table i. Splitting Platform j. Meat Rail k. Pressurized Water Hose with Rack l. Brisket Opening Platform m. Brisket Saw 	Requirement in "AA" and <ul style="list-style-type: none"> a. Veterinarian b. Office for NMIC personnel c. Pest Control Program