

AN ROINN TALMHAÍOCHTA, BIA AGUS MARA
DEPARTMENT OF AGRICULTURE, FOOD AND THE MARINE

MINIMUM SPECIFICATION FOR LAYING HEN HOUSES

The receiving of this specification does not imply approval of a grant application. However, if written approval is issued, then this specification becomes part of the contract between the applicant and the Department of Agriculture, Food and the Marine.

This is a minimum specification. Where the word “SHALL” is used, then that standard (at least) **must** be followed in grant-aided buildings. Where a procedure is “RECOMMENDED”, this is advice only on good practice.

Note that all references to other Department Specifications are to the current edition of that specification [available on the Department of Agriculture, Food and the Marine’s Website (www.agriculture.gov.ie) under Farm buildings]. Similarly, references to Standards are to the current edition of the Irish, British or European Standard, as appropriate.

This specification covers the design, ventilation, insulation and internal layout of poultry houses. For the design and construction of a building’s superstructure, Department of Agriculture, Food and the Marine specification ‘S101: Minimum Specifications for the Structure of Agricultural Buildings’ shall be read and followed alongside this specification. For the design and construction of reinforced concrete tanks and slurry channels, Department of Agriculture, Food and the Marine specification ‘S123: Minimum Specification for Bovine Livestock Units and Reinforced tanks’ shall be read and followed alongside this specification. However, if other structural designs are used, then a full set of design drawings and full structural calculations shall be prepared by a chartered engineer, and given to this Department for prior approval before the start of construction.

This specification incorporates all of the requirements in S.I. No. 14 of 2008, European Communities (Welfare of Farmed Animals) Regulations, and any subsequent amendment to the Regulations. Any building which does not comply with the accommodation, hygiene, and safety clauses of this specification may not be used by law.

1 Safety

1.1 Responsibility for Safety

Applicants are reminded that they have a duty under the Safety, Health, and Welfare at Work Act 2005 to provide a safe working environment on the farm, including farm buildings, for all people who may work on that farm. There is a further duty to ensure that any contractor, or person hired to do building work, provides and/or works in a safe environment during construction.

1.2 Safety during Construction

Farmer/Applicant Responsibility: Please note that neither the Minister nor any official of the Department shall be in any way liable for any damage, loss or injury to persons, animals or property in the event of any occurrence related to the development and the applicant shall fully indemnify the Minister or any official of the Minister in relation to any such damage, loss or injury howsoever occurring during the development works. It is the applicant’s responsibility to provide a construction stage project supervisor.

Dangers: Where the applicant/farmer is undertaking any part of the above work, it is his/her responsibility to seek competent advice and to undertake all temporary work required to ensure the stability of excavations, superstructure, stanchion foundations, wall foundations, to guard against

possible wind damage and to avoid any other foreseeable risk. It is also his/her responsibility to ensure that any drains, springs or surface water are diverted away from the works.

Power lines: Due to the complex criteria involved, where buildings are proposed within 35 metres of the centre of any overhead power line, the landowner shall contact ESB Networks in advance to ascertain the specific minimum building clearance requirement. It is a requirement on landowners under The Electricity Supply Acts to notify ESB Networks, at least, two months before commencement of any construction works near overhead lines. As a guide, table 1 below sets out the usual minimum clearance distances required, however, ESB Networks shall be contacted and their advice followed for any structure within 35m of the centre line of an overhead power line. ESB will provide landowners with written confirmation of the required clearances. Landowners can contact ESB through phone numbers provided on their electricity bills.

Where building work is undertaken near power lines there is also a safety issue regarding Machinery, Tipper Trucks and Elevators operating without proper safety measures in place. When landowners contact ESB they will be provided with relevant safety literature.

Table 1: In general the following clearances apply to various voltage levels.

Voltage	Clearance
Low Voltage	0.5 to 3 Metres
Medium Voltage	3 to 6 Metres
38KV Lines	10 to 17 Metres
110kv Lines	23 Metres
220KV Lines	30 Metres
400KV Lines	35 Metres

Note:

- ESB overhead lines consist of lines at various voltage levels and require specific safety clearances from buildings depending on voltage level and construction type.
- Clearances are specific to the line voltage, building height, location in line span and ground levels.

Danger to children: It is the applicants responsibility to prevent children from playing or spending time in the vicinity of any construction work.

Roof work: When working on any roof, it is essential to assume that the roof is fragile, unless confirmed otherwise by a competent person.

The HSA Code of Practice for Safety in Roofwork shall be consulted prior to any work being undertaken on a roof. All advice in the code of practice shall be followed.

The HSA code of practice gives recommendations and practical guidance on how to work safely on roofs, including the safe maintenance of roof mounted plant and services, and how to design and plan for safe working. It offers guidance on the design and construction of roofs on new buildings and the maintenance, cleaning and demolition of existing roofs. All work at height poses a risk and a risk assessment should be carried out to assess those risks and put appropriate controls in place.

1.3 Safety Notices

Safety notices shall be placed at the entrance to each of the layer house buildings and shall read the following “AUTHORISED PERSONNEL ONLY”.

A safety notice shall be securely fixed beside every new agitation point for The notice should be as close to the agitation point as possible. A typical agitation point safety notice is shown in Figure 1 below. The sign shall be not less than 490mm wide by 410mm high, and shall be printed on an aluminium alloy board.

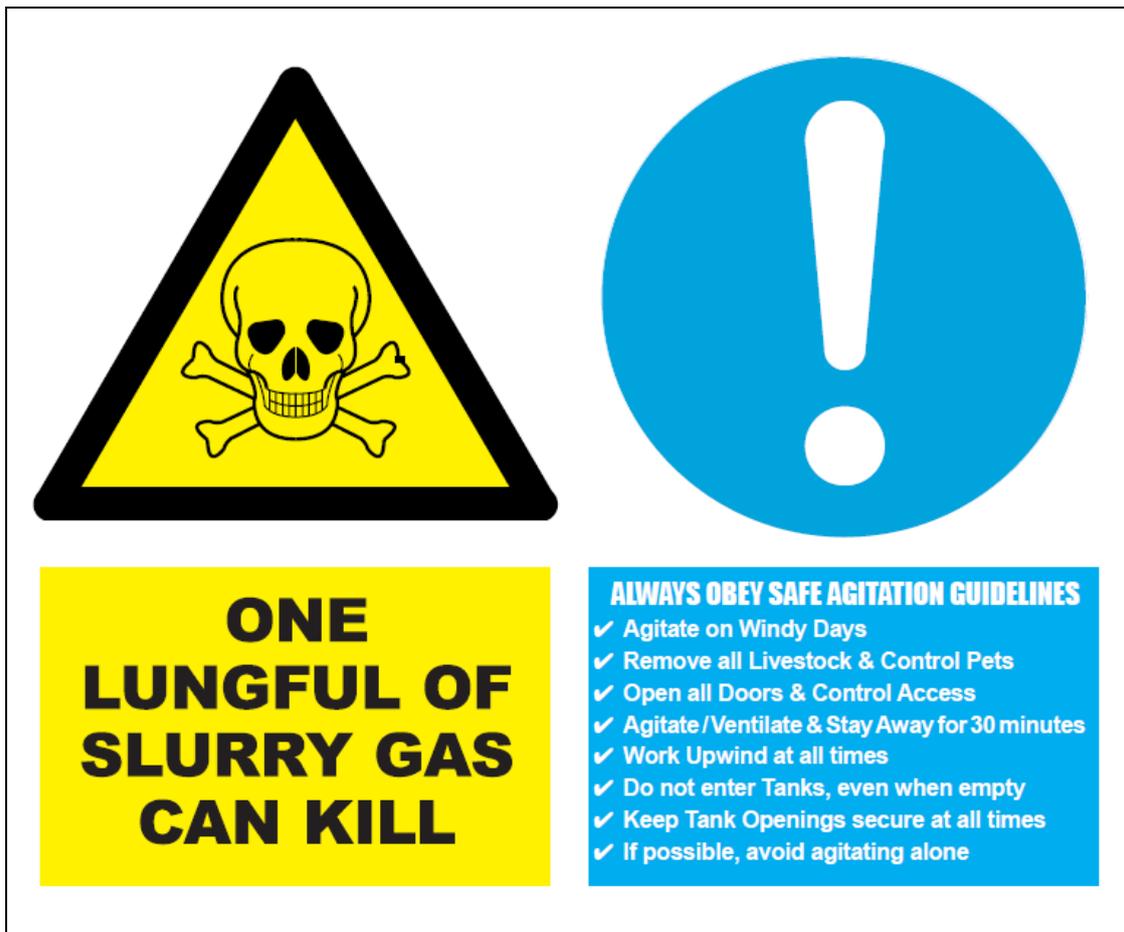


Figure 1: Typical agitation point safety notice.

1.4 Toxic Gases and Agitation

Harmful gases are generated in slurry stores and these have been responsible for both human and animal deaths. Good ventilation in slatted buildings is always important, and is vital during agitation or emptying of the tanks. Where silage effluent has been added to the slurry there can be a danger of more concentrated gases. Therefore:

1. Tanks shall always be agitated and/or emptied from the external agitation points, and never from openings within the house.
2. Agitation shall take place on windy days.
3. All animals shall be removed from the house before agitation commences. It is recommended that animal holding pens are installed close to the house to facilitate this removal.
4. All doors, and any feed-flaps, shall be fully opened before agitation/emptying begins and kept open until completion of tank emptying.
5. No person shall enter the house during agitation or emptying.
6. When agitating slurry always work upwind of the tank.
7. Some poisonous slurry gases are heavier than air. No person should climb down into an emptied or part-emptied tank without breathing apparatus. Such apparatus requires full training before it can be used.
8. Always keep the tank openings secure.
9. If possible avoid agitating alone. Always ensure that someone knows that agitation is being undertaken and the expected completion time.

1.5 Maintenance

All farm buildings require regular maintenance to ensure the health and safety of personnel and animals. Fittings such as slats, electrical fittings, drinking arrangements, etc., should be periodically checked, and all defective items replaced.

2 CONCRETE SPECIFICATION

2.1 Certificates

Concrete shall be produced in a plant audited to I.S. EN 206-1: 2002 by a certified body accepted by The Department of Agriculture, Food and the Marine (e.g. N.S.A.I., B.S.I., Q.S.R.M.C). Concrete shall not be produced on site.

A numbered certificate, signed and stamped, shall be required for all concrete delivered to site. The certificate, the "Concrete Manufacturers' Specification Certificate", is produced in triplicate. The top certificate, printed on light blue paper, shall be retained by the applicant and given to and retained by the local AES Office of the Department of Agriculture Food and the Marine for inspection upon completion of the works.

2.2 Curing of Concrete

Concrete produced and supplied is fit for purpose ONLY IF proper curing procedures are adhered to and the structure is not put into service until an adequate curing time (usually a minimum of 28 days) has elapsed. The curing regime shall take account of best practice appropriate to the concrete binder composition and prevailing climatic conditions at time of placing.

All concrete shall be cured by keeping it thoroughly moist for at least seven days. Wetted floor slabs and tank walls shall be protected by polythene sheeting, kept securely in place. Alternatively proprietary curing agents may be used in accordance with manufacturer's instructions. When frost is a danger, straw bales shall be placed over the polythene on slabs. Concrete shall be at least 28 days old before being subjected to full load, or to silage or silage effluent.

For further information on curing, see the website of the Irish Concrete Society.

2.3 Concrete

For all poultry housing, and slurry tanks under poultry houses, concrete shall be purchased on the basis of a characteristic 28 day cube crushing strength of 37N/mm^2 (strength class C30/37). Minimum cement content shall be 310 kg/m^3 . The maximum water to cement ratio will be 0.55. The specified slump class shall be S2 or S3. The maximum aggregate size shall be 20mm.

The concrete shall be ordered using the appended form for 'S.100 Mix B' or by requesting '37N concrete with 310kg cement minimum, 0.55 water cement ratio maximum, and slump class S2 or S3, certified to IS EN 206, for use to Specification S.100'.

In the case of exposed yard slabs where freeze/thaw action is a concern, 'S.100 Mix B' shall be used with 3.5% minimum air entrainment. Alternatively 'S.100 Mix A' may be used.

2.4 Compaction of Concrete

All concrete shall be compacted by either vibrating screed or poker vibrator depending upon the position of the concrete. Poor compaction leads to entrapped air, which will weaken the concrete and may cause premature failure. All concrete can be easily placed and compacted when using a vibrating screed or poker vibrator which helps ensure the concrete achieves its full strength.

2.5 Fibres

Polypropylene fibres may be incorporated into the concrete mix to improve the properties of concrete. Only fibres which have been tested and approved by National or European approval authorities may be used. The use of fibres helps to reduce plastic cracking and improve surface durability. Fibres shall be used in strict compliance with manufacturer's instructions and shall only be added at the concrete manufacturing plant. The concrete certificate (Clause 2.1) shall clearly show the amount and type of fibre added. The mix design, compacting, and curing of fibre concrete is the same as concrete without fibre.

2.6 Self-Compacting Concrete

Self-compacting concrete (SCC) may be used in vertical elements only. SCC must comply with all requirements of this specification, except for the slump class which must meet slump flow class SF2. SCC shall be produced by a manufacturer with experience in producing SCC and should be placed by a contractor with experience using SCC.

If it is proposed to use SCC, additional guidance shall be sought by the contractor undertaking the works. Particular care must be taken in the use of fully sealed formwork, designed to withstand the higher hydrostatic pressure exerted by SCC. Guidance can be obtained from the Irish Concrete Society website (www.concrete.ie).

2.7 Materials

Cement and other materials used in the production of concrete shall be in accordance with Department of Agriculture, Food and the Marine specification S.100.

Plasticisers and other admixtures shall be to EN 934. All admixtures shall be used in strict accordance with manufacturer's instructions, and shall be added only by the concrete-mix manufacturer.

2.8 Tests

The Department reserves the right to require that concrete should be tested in accordance with EN 12390 and EN 12504.

3 ELECTRICAL INSTALLATIONS

Wiring and fittings shall be installed, and all work shall be carried out in accordance with the Fourth Edition of the National Rules for Electrical Installations, ET101:2008 specifically Part 7-705: Requirements for special installations or locations - Agricultural and horticultural premises. An ETCI completion certificate shall be required, signed by the Electrical Contractor(s) or a person duly authorised to act on his/her behalf to certify that the electrical installation has been constructed and/or has been tested according to the National rules of Electrical Installations and has been found to be satisfactory. An associate certificate, specifically for agricultural work, the "Supplementary Agricultural Certification Form" shall also be signed by the Electrical Contractors or authorised persons and the number of the main ETCI completion Certificate clearly marked on it. If no valid numbered ETCI Certificate is available for the completed installation, then the Electrical Contractor shall complete a new numbered ETCI Certificate indicating that the new installation has been tested for safety and compliance, and note that number on the Supplementary Form. The signed printed "Supplementary Agricultural Certification Form" together with a copy of the ETCI Completion Certificate shall be given to the Department of Agriculture, Food and the Marine before grant-aid can be finally certified.

4 SITE

Particular attention shall be paid to the siting of a new poultry house in relation to access, other existing and proposed livestock housing, feed stores and possible extensions. The site shall be

isolated from other farm or poultry enterprises and shall be protected by a physical barrier that precludes entry from other farm animals, however shared road access to other farming enterprises is permissible. The physical barrier shall be in the form of a 2m-perimeter fence. When constructed the perimeter shall be kept free of all debris, vegetation (grass, weeds) and equipment at all times.

The site shall be carefully chosen with a view to minimising operational and constructional problems. It shall be well separated from potential fire hazards, and sheltered if possible. Sites that are vulnerable to flooding shall be avoided. As a general guide, a poultry house and/or storage facility for slurry/soiled water/manure should be located not less than 50m from any waterbody in the case of new farmyards, and not less than 10m in the case of extensions/modifications to an existing facility. The minimum distance between a new poultry house and a public/private water supply source, either surface or ground, shall be 60m. In vulnerable situations this distance shall be increased up to 300m.

The Department of Agriculture, Fisheries and Food strongly recommend that any person planning a poultry house consult an advisor / consultant in relation to suitable site locations prior to submitting planning permission.

5 HOUSING SYSTEMS

5.1 Enriched Cages

All cages shall be of the enriched type. **The construction of un-enriched cages is not permitted.** The minimum area of any one cage shall be not less than 2000 cm² (0.2m²), with an area of at least 750cm² (0.075m²) per laying hen of which a minimum of 600cm² (0.06m²) per bird shall be useable space. The slope on the useable area of the cage shall not exceed 14% and shall be at least 30cm (0.3m) wide.

No cage shall be less than 20cm (0.20m) high over the unusable part of the cage. The minimum height over the useable part of the cage shall be not less than 45cm (0.45m).

Litter shall be provided in every cage to permit pecking and scratching by each laying hen. This can either be actual litter or specially designed litter mats. Feed may be used as a form of litter for the birds to peck and scratch at. The feed/litter shall be directed onto the mat via a suitable automated mechanism.

Suitable **Claw-shortening devices** shall be fitted in every cage.

Nests shall be fitted in every cage. A nest is defined as a separate space for egg laying, the floor components of which shall not include wire mesh that can come in contact with the birds, for an individual hen or group of hens. The floor area of nest shall be covered with a suitable nesting mat.

Perches of at least 15 cm (0.15 m) length shall be provided for every laying hen within the cage.

The cage floor shall be constructed in a manner that adequately supports each forward facing claw of the laying hen.

Cage doors shall be designed and be of such dimensions that an adult laying hen may be removed without unnecessary suffering or sustaining injury. It is recommended that the minimum size of cage doors be between 1800-2040cm² (0.18m²-0.204m²) with the minimum door height of 34cm (0.34m). All cages shall be constructed in a manner that prevents a laying hen from escaping.

Aisle widths shall be a minimum width of 90cm (0.9m) to facilitate inspection, installation and depopulation of hens between tiers of cages. A space of at least 35cm (0.35m) must be allowed between the floor of the building/catwalk (where applicable) and the bottom tier of cages.

Accommodation that comprises two or more tiers of cages shall have devices (or other appropriate measures shall be taken) to facilitate the inspection of each tier and removal of laying hens without difficulty.

5.1.1 Feeding and Drinking Arrangements for Enriched Cages

All feeding and watering equipment shall be designed, constructed and placed so that contamination of food and water and the harmful effects of competition between hens is minimised.

Feed troughs shall be provided, to which each laying hen has unrestricted access. At least 12 cm (0.12 m) length of feed trough shall be provided for every laying hen within the cage. The feed trough shall be between 8-10cm (0.08-0.10m) in width at its widest point and have a depth of between 3.9-10cm (0.039-0.1m). The troughs shall be readily accessible to all the layers within the cage. Consideration shall be made in the design of the trough so as to avoid spillage / wastage while being filled by the automated feeders and during feeding.

Drinking systems shall be fitted in every cage, to which each laying hen has unrestricted access, appropriate to the number of laying hens in the cage. In addition there shall be at least two nipple drinkers or cups within reach of each laying hen. A minimum of 1 drinker shall be provided per approximately 10 birds.

A Water meter or suitable accurate water measurement system shall be installed to measure consumption of water. This is used as an excellent indicator of flock health and vigor.

5.2 Free-Range and Barn systems for Laying Hens

Stocking density must not exceed nine laying hens per 1m² of useable area. The minimum height over the useable part of the house shall be not less than 45cm (0.45m).

Litter area of at least 250 cm² (0.025m²) per hen and covering at least one third of the ground surface, shall be provided.

A nest space of at least one nest for every seven hens shall be provided. If group nests are used a minimum of 1 m² of nest space shall be available for every 120 hens. It is recommended that the minimum individual nest size shall be 25 cm x 30 cm deep with a minimum roof height of 30 cm, which is suitable for seven hens.

Adequate Perches that do not have any sharp edges shall be provided in all free range and barn systems. At least 15 cm (0.15m) in length of perch shall be provided for every hen in the barn or free-range system. The horizontal distance between perches shall be at least 30 cm (0.30m) and the distance between a perch and a wall shall be at least 20 cm (0.20m). The perches shall not be mounted over the littered area of the house.

Where perches are at different levels, the minimum distance between perches shall be 30cm. Where a perch is directly (no deviation permitted) over another perch, then the minimum distance may be reduced to 20cm. There shall be a minimum of 20cm clear headroom above every perch.

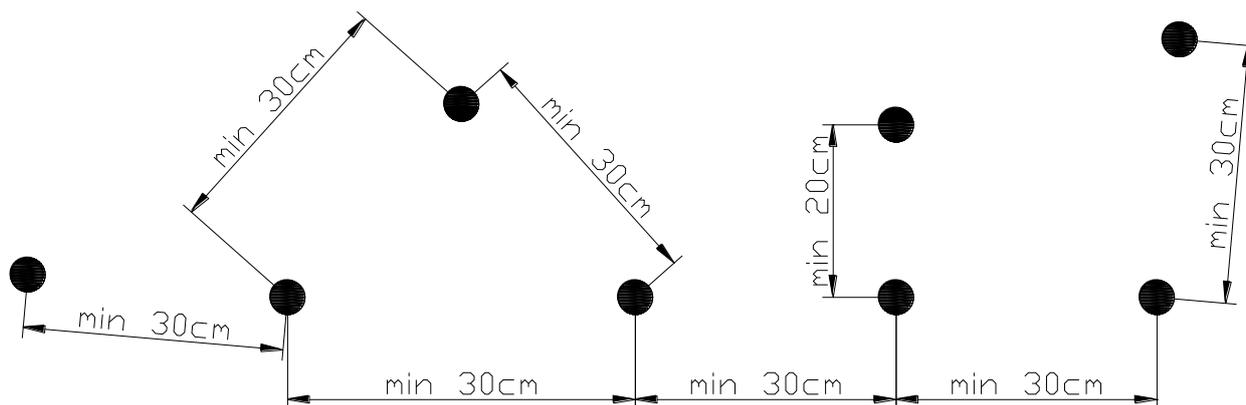


Figure 1 – Acceptable arrangement of perches

There shall be no more than four different levels in any barn or free-range system. The headroom between each level shall be not less than 45cm (0.45m). These units shall be designed so that droppings from one level cannot fall on another level.

The floor shall be constructed in a manner that adequately supports each forward facing claw of the laying hen.

5.2.1 Feeding and Drinking Arrangements for Free-Range Housing

All feeding and watering equipment shall be designed, constructed and placed so that contamination of food and water and the harmful effects of competition between birds are minimised. All hens shall have equal access to drinking and feeding facilities.

Feeder space of at least 10 cm per hen with linear feeders or at least 4 cm per hen with circular feeders shall be provided in every free range and barn system. The feed trough shall be between 8-10cm (0.08-0.1m) in width and have a depth of between 6-7cm (0.06-0.07m).

Water shall be provided by either of the following:

- 1) continuous drinking troughs providing at least 2.5 cm per hen or
- 2) circular troughs providing at least 1 cm per hen or
- 3) one nipple drinker or cup for every ten hens with at least two nipple drinkers or cups are within reach of each hen.

Please note: - all birds shall have permanent access to a suitable fresh water supply or be able to satisfy its fluid intake needs by other means.

All water pipes shall be manufactured in compliance with IS EN 12201 and be a minimum of PE40. These will either be fully blue or have a blue longitudinal strip.

A Water meter or suitable accurate water measurement system shall be installed to measure consumption of water.

6 DESIGN OF THE BUILDINGS

6.1 General Design

Building materials used for the construction of accommodation, and in particular for the construction of cages and equipment, with which a laying hen may come into contact, shall not be harmful to the birds and shall be capable of being thoroughly cleaned and disinfected.

All parts of buildings, equipment, machinery or other utensils that may come into contact with laying hens shall be capable of being thoroughly cleansed and disinfected.

The entire floor area of every house shall be of concrete as specified in clause 6.3.1.

Accommodation and fittings shall be constructed and maintained so that there are no sharp edges or protrusions likely to cause injury to the laying hens.

The building shall be designed so that the sound level is minimised and any constant or sudden noises on the premises avoided.

Ventilation fans, feeding machinery and other equipment shall be constructed, located, operated and maintained in a manner that causes the least possible noise.

Insulation and ventilation control shall be provided to ensure that the temperature is capable of being maintained at a thermally comfortable temperature of between 18°C and 23°C. In less densely stocked houses heating facilities may be required. Straw bedded houses shall be designed to be thermally comfortable at all times.

Essential Management: All automated or mechanical equipment essential for the health and welfare of the birds must be inspected daily (e.g: ventilation, water supply, feed supply, etc.). Where defects are discovered, these must be rectified immediately, or if this is impossible, appropriate steps must be taken to ensure the health and welfare of the birds.

Droppings must be removed as often as necessary and dead laying hens must be removed when found or, at a minimum, once a day.

6.2 Roof

6.2.1 Structure

All roof structures shall comply with Department of Agriculture, Food and the Marine's current edition of specification S101: Minimum Specifications for the Structure of Agricultural Buildings. Alternative proprietary construction systems (e.g. proprietary structural wall panels) may be used if such systems have received the prior acceptance of the Department of Agriculture, Food and the Marine. Gutters and downpipes shall be fitted to all roofs and arranged so as not to discharge onto soiled yards. All metal cladding fixed to timber rails or purlins shall be separated by a layer of DPC.

All cladding used in poultry houses shall have a minimum guarantee of 20 years for use in a poultry house and shall have been tested in accordance with the requirements of S.102. Where sandwich cladding is used, then the sheets on both faces of the panel shall meet these standards.

The use of painted aluminum cladding is permitted in addition to cladding sheets meeting the above requirements. The use of non-metal cladding materials shall either be listed on S.102 or have prior acceptance by the Department of Agriculture, Food and the Marine. The use of non-metal ceiling liners and dividers is permitted subject to prior acceptance by the Department of Agriculture, Food and the Marine.

For new buildings the internal ceiling height of the roof over the interior floor level shall not be less than 3.0 m. For conversions the minimum height allowable shall not be less than 2.1m.

6.2.2 Insulation

The insulation in the roof of caged poultry housing shall have a U-Value of less than **0.4W/m²/°C** i.e. the lower the U-Value the better.

Roof insulation for Caged Housing shall be one of the following:-

- 1) 70mm extruded polystyrene; or 70mm expanded polyurethane or 75mm expanded polystyrene, protected on the underside by a vapor barrier.
- 2) 100mm glass wool on continuous vapor barrier supported by a fiber-reinforced board, or oil-bound hardboard ceiling.
- 3) 50mm of sprayed expanded polyurethane foam.
- 4) Other proprietary material of equivalent insulating value and with vapor barrier if required.

Insulating boards shall be tongue and grooved, or have tapered edges on all sides to prevent vapor transmission. Roofs and ceilings shall be constructed to prevent rodent access to insulation material.

The insulation for barns and free-range housing shall have a U-Value of less than **0.3W/m²/°C**

Roof insulation for Barns or Free-Range Housing shall be one of the following:

- 1) 100mm extruded polystyrene or 75mm expanded polyurethane board, protected on the underside by a vapour barrier.
- 2) 150mm glass wool on continuous vapour barrier supported by a fiber-reinforced board, or oil bound hardboard ceiling.
- 3) 75mm of sprayed expanded polyurethane foam.
- 4) Other proprietary material of equivalent insulating value and with vapor barrier if required.

In the case of conversions, 60mm extruded polystyrene is acceptable if already in place.

6.3 Floors of Buildings

All standard concrete floors for free range housing and enriched cages systems housing shall be constructed as per the Department of Agriculture, Food and the Marine specification S101 – Minimum Specifications for the Structures of Agricultural Buildings, as outlined in clause 6.3.1.

6.3.1 Solid Floors

Solid floors for the free range housing and housing of enriched cages shall be of at least 125mm thick mass concrete on at least 150mm hardcore. The floors shall be laid smooth with a non-slip finish. A minimum of 150mm thick hard-core base shall be laid, compacted with vibrating or heavy roller, and topped with fine sand. All floors shall incorporate 1000 gauge polythene DPC membrane with 600mm overlaps laid on the sand under the concrete. The polythene membrane shall be taken up along walls to meet DPC where this has been installed.

In cases where fill is purchased for use under concrete, it shall be certified to EN 13242:2013 and meet the requirements of Annex E of S.R. 21: 2015. This material shall also be used as the top 300mm of any backfill around stanchion foundations.

The floor in free-range and barn houses shall have a fall of 1 in 24 towards a drainage passage, except the area under the equipment where the floor shall be level. The entire floor area in caged houses shall be level to accommodate the cages. Suitable drains shall be installed in the floor of caged houses for the removal of soiled water when cleaning. All drainage channels in the floors shall be diverted to the relevant soiled water or effluent tank.

Where required concrete slabs over tanks shall be designed as per the Department of Agriculture, Food and the Marine specification S123 – Minimum Specification for S123 Bovine Livestock Units and Reinforced Tanks.

6.3.2 Alternative Flooring

Floors may also be slatted over tanks or channels, using timber, plastic or galvanised slats or slats of other proprietary systems. This type of flooring must also conform to clause 5.2. This type of flooring shall be installed in accordance with the manufacturers instructions.

6.3.3 Insulated Floors

Where an insulated floor is required, it shall be constructed as follows:

A minimum 150mm hard-core base shall be laid, compacted with vibrating or heavy roller, and topped with fine sand. A 100mm layer of concrete shall then be laid onto the hardcore and finished smooth. On top of this 1000 gauge polythene DPC membrane with 600mm overlaps shall be laid, on top of which the insulation (25mm expanded polyurethane or extruded polystyrene, or 35mm expanded polystyrene) shall be placed. The floor shall be finished with a 50mm layer of concrete finished smooth with a non-slip finish. These floors shall have a fall of 1 in 24 towards a drainage passage.

6.4 Foundation

Foundations for walls shall be excavated to a depth of 600mm below original ground level or until firm strata is encountered.

Footings shall be at least 225mm deep and as wide as the wall to be carried plus 225mm on each side. The entire underfloor area shall be stripped of topsoil.

6.5 Walls

The insulation in the walls of poultry housing shall have a U-Value of less than $0.4W/m^2/^\circ C$ i.e. the lower the U-Value the better the insulating properties.

Exterior walls shall be any one of the following or have a U-Value equivalent or better than that above: -

1. Continuous cavity construction of two 100mm leaves, properly tied by purpose-made ties leaving a 100mm air cavity: top of cavity and openings for windows, doors and air-inlets to be closed in a suitable manner and fitted with vertical D.P.C. Insulation shall be by boards fixed to the inner leaf [60mm extruded polystyrene and 40mm air cavity or 90mm fiberglass and 10mm air cavity; or, if protected by a vapor barrier on the inner side, 50mm expanded polyurethane and a 50mm air cavity or 80mm expanded polystyrene and a 20mm air cavity].
2. The 100mm cavity may also be filled with polystyrene beads protected by a vapor barrier.
3. Composite wall panels/side cladding which consist of two layers of metal sheeting with a layer of insulation between the sheeting with a minimum U-Value of $0.4W/m^2/^\circ C$. This type of cladding is used mainly with timber or steel framed buildings constructed to the Department of Agriculture, Food and the Marine specification S101 – Minimum Specifications for the Structures of Agricultural Buildings.
4. 12mm timber tongue and grooved sheeting which shall be treated with a suitable wood preservative followed by at least 90mm (0.09m) glass fibre batt insulation inserted between the stud spaces protected by the vapor barrier and finished with 10mm (0.01m) fiber cement board. This would be mainly used in timber-framed houses.

If mass concrete walls are constructed they shall be insulated to the same level as 1 above.

All concrete walls shall be smooth plastered internally to a height of at least 1.3m and be well-pointed, smooth-finished or dashed externally. A DPC (damp-proof course) shall be fitted not less than 100mm above floor/yard level.

All block walls shall be of solid blocks that are certified to a minimum strength of 7.5N/mm², though it is strongly recommend that they be constructed of mass concrete. All blocks used shall be produced in a plant certified to EN 771-3:2011 and shall be CE marked. The use of hollowcore blocks is not permitted.

Internal walls shall be of 100mm solid block, plastered both sides to at least 1.3m and fitted with a damp-proof course. When these walls support the roof the floor under them shall be thickened to 225mm. On unfirm ground, the thickened slab shall be reinforced.

Proprietary internal and external wall panels such as proprietary composite sheeting with integral insulation may be used provided that they are designed for at least a 20-year working life. These wall panels shall have a stainless steel skin for any area that may be in contact with laying hens, and be so protected as to prevent rodent damage. The insulation shall at least meet the requirements set out for on-site constructed walls.

6.5.1 Walls over tanks

Walls shall not be built directly onto slats under any circumstance. Where a wall needs to be built over a tank supporting beams shall be constructed that will rest on the tank walls and/or on 300mm (min.) square concrete piers. The beams shall have at least 150mm support at each end. The beams shall be designed as per S123, clause 8.12 or 8.13. An alternative to the use of walls and beams are the use of movable wall panels.

6.6 Ventilation of Structure

Ventilation shall ensure that air circulation, dust level, temperature, relative humidity, and gas concentrations are kept within limits not harmful to the birds.

Ventilation shall be mechanical; natural; or automatically controlled natural ventilation (ACNV).

The ventilation rate shall be capable of being reduced to such a level so as not to chill the birds at any time, while still maintaining sufficient air changes.

When designing the ventilation system, care shall be taken to ensure that there are no ‘dead-air pockets’ within the building.

When **mechanical ventilation** systems (including ACNV) are used, appropriate emergency back-up systems shall be installed in case of failure. Mechanical ventilation systems shall also be alarmed in case of failure. The alarm shall have a power supply independent of mains electricity. The alarm system shall be tested once a month and maintained in proper working order. An electric generator shall be installed where mechanically controlled ventilation is used, in case of mains electricity failure. In free range housing forced ventilation systems should be able to expel at least 5.6m³air/bird/hour and for enriched caged housing 5.1m³air/bird/hour.

Table 1. Maximum Ventilation Rates (m³/hr/1,000 birds)

Liveweight (kg)	Laying Birds (1,000)
2	9,000
2.5	10,800
3	12,250

(1m³/hr=0.588ft³/min)

Air-inlets shall be automatic or hand-regulated box-type that divert air towards the ceiling, and fitted with a control shutter. Inlets shall not be more than 1.5m from the end of the bird area or more than 4m apart; depth of inlet shall be between 75mm and 550mm; distance from ceilings shall be at least 150mm. Where natural ventilation only is used, the total area of inlets shall be twice the area of chimney or other type of outlet with fan extraction, inlets shall be sized appropriate to fan capacity.

Note: If other air-inlet systems are to be used, full details of the system shall be supplied to the Department of Agriculture, Food and the Marine for approval prior to the start of construction.

Air-outlets shall be designed to one of the following:

1. By extractor fans, with speed and thermostatic control, and with overload safety device. Fans shall be of sufficient power to operate against strong winds and rated to give adequate air changes for the house when fully stocked. Fans may be fixed in a wall opening, or in a duct, or flue (chimney) leading out through the roof to finish 450mm above the ridge. The duct or flue may be constructed of timber, PVC, fibre-reinforced board or other suitable material.
2. By natural ventilation either by controlled openings at high level, or along the ridge, or by flue or duct constructed as outlined above and fitted with a butterfly valve manually operated to control the rate of airflow. The top of the flue shall be at least 1.8m above the inlet and covered to prevent rain ingress. The flue may be constructed of timber, PVC, fibre-reinforced board or other suitable material, insulated with 50mm of expanded polystyrene, or equivalent and protected by a vapor barrier. In a mono-pitch house, ventilation may be by a pivoted front vent, manually operated.

6.7 Doors

The minimum number of doors necessary for the satisfactory working of the house shall be fitted. Doors shall be ledged, braced, and sheeted, or of other suitable construction, and fitted in rebated frames. **All external doors wider than 1.2m shall be sliding.** Cladding materials for doors shall conform, at least, to the standards specified in specification S102. All external woodwork shall be given at least two coats of lead-free paint.

To comply with fire regulations a door shall be installed at each gable end of the house and at 90m intervals around the house.

6.8 Lighting

Sufficient lighting levels shall be provided in all buildings to allow all hens to see one another and be seen clearly, to investigate their surroundings visually and to show normal levels of activity. Where there is natural light, light apertures must be arranged in such a way that light is distributed evenly within the accommodation.

After the first days of conditioning, the lighting regime shall be such as to prevent health and behavioral problems. Accordingly it must follow a 24-hour rhythm and include an adequate uninterrupted period of darkness lasting, by way of indication, about one third of the day, so that the hens may rest and to avoid problems such as immunodepression and ocular anomalies. A period of twilight of sufficient duration ought to be provided when the light is dimmed so that the hens may settle down without disturbance or injury.

- Lighting shall be provided to coincide with natural day-light.
- A **time-switch** shall be installed, with a recording device to indicate the number of hours that the lights are on, to ensure that the lighting requirements are achieved.
- Lights should be positioned so as to prevent the formation of 'dark corners'. Light intensity must be provided in such a way that it is uniform at bird level to encourage even distribution of hens throughout the house and must be capable of being dimmed.
- Adequate lighting (fixed or portable) shall be available to enable the stockperson to thoroughly inspect the birds at all times.
- Lights must be provided in such a way that they are easily cleaned and that dirt is not allowed to build up on them.

- Additional portable lighting of 100 lux shall be provided to enable close inspection of sick birds.

6.9 Store / Collection Room

A storage and collection room shall be provided for the collection and storage of the eggs produced by the hens. This store/collection room may be part of the laying house or in a separate adjacent building. The area shall be separated by a wall built to roof level or by a dividing physical barrier such as a tunnel/walkway. There shall be a suitable solid door dividing the two areas. Allowances shall also be made in the division for the egg collection conveyor. These rooms shall be lined and insulated in the same manner as the rest of the house. In some cases the storage and collecting room may be incorporated into the one room provided all of the above conditions are met. The floor walls and internal roof of the store/collection room shall be constructed so that it can be easily cleaned and disinfected.

6.10 Isolation Facilities

Where necessary, a sick or injured bird shall be isolated in suitable accommodation with, where appropriate, dry comfortable bedding.

7 PROTECTION OF FIXTURES AND FITTINGS

It is recommended that cages, feed troughs, and access fittings (Clauses 6.2 and 6.3) should be galvanised. Any exposed ungalvanised steel other than structural steel shall be given 3 coats of lead-free anti-rust paint. Timber doors and other timber joinery shall be given a primary coat, 2 undercoats, and a hard gloss finish coat of lead-free paint. Doors may be also dried and treated to the Department of Agriculture, Food and the Marine specification S101 - Minimum Specifications for Agricultural Buildings, A5.1.2.

Where pen divisions, barriers, etc., are being fixed to already galvanised or painted stanchions, it is recommended that bolts be used rather than welded connections. Alternatively any welding damage shall be made good as described in the protection of structural steel clause in specification S101.

8 WASTE

8.1 Storage Capacity

A **minimum of 26 weeks storage** shall be provided in all new and converted structures in line with the requirements of S.I. 31 of 2014 European Communities (Good Agricultural Practice for Protection of Waters) Regulations and any subsequent amendments to the regulations. However, where the Local Authority has specified a higher winter storage period, then this must be complied with.

Note: The requirements for the capacities of farmyard manure, slurry, effluent, and soiled water stores which are defined in S.I. 31 of 2014 Regulations shall be followed. The regulations require that an additional freeboard of 200mm must be provided for all covered tanks and 300mm for all uncovered tanks. A tank covered by slats only is not considered to be covered in respect of allowances for rainfall and freeboard.

8.2 Manure Pits

All effluent / solid farmyard manure and soiled water shall be stored in compliance with the current edition of the 'Nitrates Directive' S.I.31: 2014, European Communities (Good Agricultural Practice for the Protection of Waters) Regulations. All solid farmyard manure storage facilities from poultry production shall be constructed in accordance with Department of Agriculture, Food and the Marine specification S108 - Manure Pits and Dungsteads. Under no circumstances shall manure from

poultry production be stored with manure from any other source. Farmyard manure or litter shall not be spread on land within 50 meters of the site.

Advice on steps to be taken on correct procedure for disposal of poultry carcasses and on how to reduce the risk of disease in animals when spreading poultry litter on land is available on the Department of Agriculture, Food and the Marine website at:

<http://www.agriculture.gov.ie/animalhealthwelfare/diseasecontrol/botulism/>

8.3 Storage Tanks

All tanks shall be designed and constructed to the standards as set out in the Department of Agriculture, Food and the Marine specification 'S123: Minimum Specification for Bovine Livestock Units and Reinforced tanks'.

Poultry litter stores shall be constructed in accordance with Department of Agriculture, Food and the Marine specification 'S108: Minimum Specification for Manure Pits and Dungsteads'.

8.3.1 Leak detection system

Where liquid slurry is being produced a leak detection system shall be installed under every new tank constructed for the containment of poultry droppings. The leak detection system shall consist of 100mm land drainage pipes distributed in a herringbone pattern under the tank. The greatest distance between two pipes shall not exceed 3 metres. The pipes shall be laid on a slope and connected to an inspection tank, of at least 2.5m³.

9 BIOSECURITY

9.1 Changing / Washing / Office Facilities

It is recommended that effective hygiene control measures be provided at the entry to each laying hen house. A separate changing/washing/office shall be provided prior to entering the house, particularly with large flocks, to provide changing facilities and an area for storage of medicines etc. and to facilitate record keeping. The room will also incorporate a wash hand basin with hot and cold running water for cleaning visitors hands on entering and leaving the premises. This room will also be used as changing facilities where stockmen shall enter the room remove their shoes and step over a 45cm (0.45m) barrier, and put on clean clothing and poultry house specific footwear before entry into the barn. Visitors upon entering the facility shall be provided with disposable coats and shoe covers to wear while in the building.

9.2 Washing apron for vehicles

It is the stockman's duty to minimise transmission of diseases onto the farm therefore, it is recommended that an apron for washing and disinfecting transport vehicles entering the poultry facility be provided. The apron shall be sized according to the relevant vehicles entering the facility of a minimum width of 3.0m. All the sides of the apron shall run to a central drainage channel where soiled washings shall be diverted to a soiled water tank. Refer to the Department of Agriculture, Food and the Marine specification S123 – Minimum Specifications for Bovine Livestock Units and Reinforced Tanks for details on soiled water tanks.

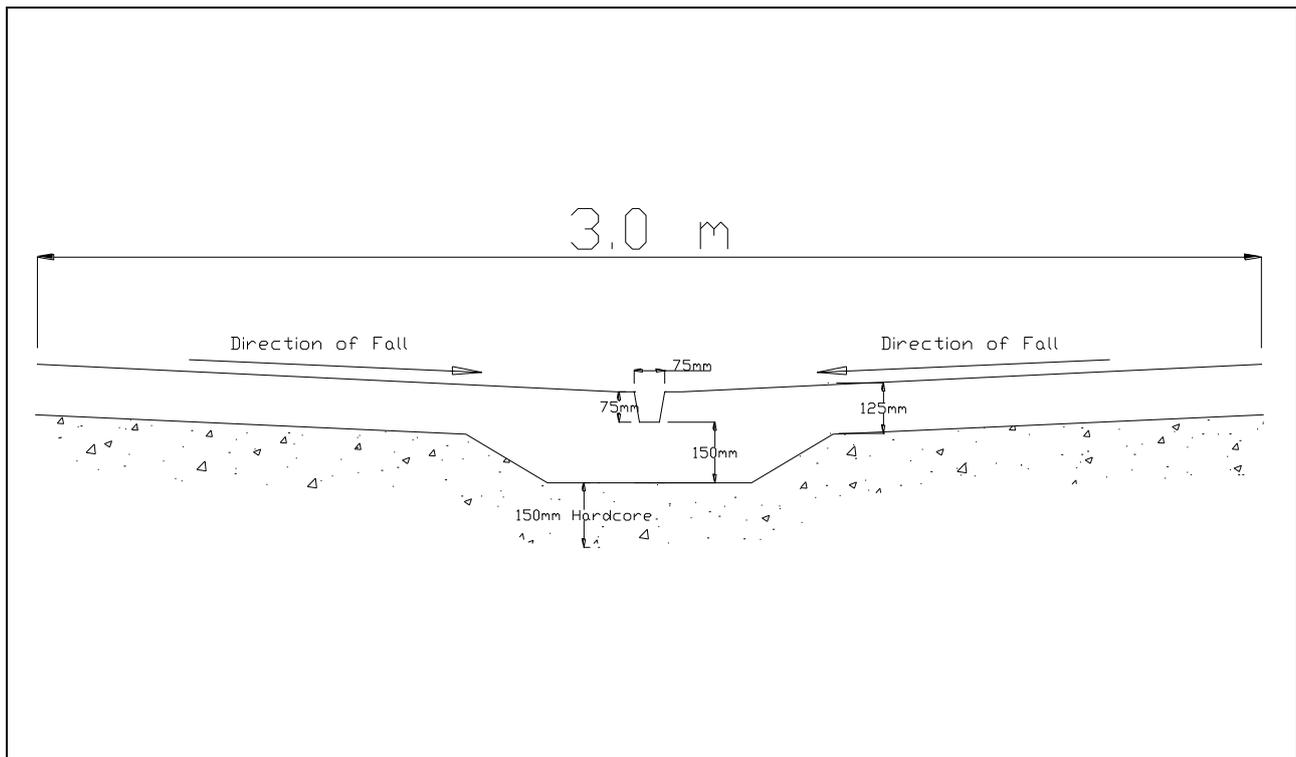


Figure 2 – Washing Apron for Vehicles

9.3 Footbaths

Permanent or semi-permanent covered footbaths shall be provided outside the entrance to each of the houses and shall be used by all stockmen and visitors prior to entry into the building.

9.4 Rodent Control

It is recommended to construct a concrete / gravel path around outer walls of each house in a poultry unit install to prevent rodents burying their way under the buildings. The concrete path should be constructed as per clause 6.3.1. If no alternative is available, vegetation around the house shall be kept short at all times and under no circumstances shall spilt feed be allowed to build up around the house.

9.5 Vermin Proofing

Constructional details shall ensure that there is no possibility of entry of vermin from any source, external or from adjacent buildings. Doors on all entrances, including entrance from storeroom shall be vermin proof. All ventilation openings other than fully sealed compressor openings shall be fitted with fly screens, made from material that will allow adequate airflow. Drain outlets shall have PVC or metal, rodent-proof, grid covers. If drains are piped directly to a slurry tank they shall be fitted with a water seal trap.

9.6 Lighting

It is also recommended to install lighting around the building to keep away predators, especially during the night.

10 CERTIFICATES

The following certificates shall be collected, and given to the Department of Agriculture, Food and the Marine before grant-aid can be paid:

- (1) “Concrete” Certificate (Clause 2.1)
- (2) “Electrical” Certificate (Clause 3)
- (3) “Protection of Structural Steel” Certificate (where appropriate)

11 RELATED DEPARTMENT SPECIFICATIONS

The current edition of the specifications listed below shall also be followed as required:-

- 1) ‘S101: Minimum Specification for the Structure of Farm Structures’ for all superstructures.
- 2) ‘S102: Cladding Materials’ for all roof and side cladding.
- 3) ‘S108: Minimum Specification for manure pits and dungsteads’ for all poultry litter stores.
- 4) ‘S123: Minimum Specification for Bovine Livestock Units and Reinforced Concrete Tanks’ for all tanks.
- 5) ‘S129: Farmyard Drainage’

Copies of these and other relevant Department specifications are available on the Department website at: www.agriculture.gov.ie under ‘Farm Buildings’ or by contacting your nearest Department office.