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

MINIMUM SPECIFICATION FOR BULL HOUSING

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.

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 applicant's 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 MAINTENANCE

All farm buildings require regular maintenance to ensure the health and safety of personnel and animals. After each winter-season buildings should be thoroughly washed and cleaned out. Fittings such as slats, electrical fittings, drinking arrangements, etc., should be periodically checked, and all defective items replaced.

2. General

Bull houses must be strong durable structures, which allow management with minimal risk to workers. The basic requirements are:

a) Protection from the weather;

b) Exercise area. An open exercise area is recommended where a bull is permanently housed;

c) Arrangements for feeding and watering without entering the bull enclosure;

d) Arrangements for safe house cleaning while the bull is housed;

e) Suitable design and structures to prevent the bull escaping;

f) Convenient and safe arrangements for the serving of cows.

Note: Where a bull is running with cows for most of the year, a covered pen without an exercise area is adequate.

3. Site

The site for bull housing shall be dry, not subject to flooding and convenient to buildings housing the cow herd. It is recommended that housing is located where the bull can see normal farmyard activities, particularly if he can see the cows pass daily to and from the milking premises in dairy herds.

4. Accommodation

Where a bull is permanently housed, the total enclosed area, pen and exercise yard shall be approximately $50m^2$. Where a bull is not permanently housed the floor area of the pen shall be approximately $20m^2$.

Suitable housing arrangements are shown on layout plans 1, 2 and 3. Each plan includes a feed stand where it shall be possible to retain the bull by a tying yoke and a drop gate. Plan 1 provides a cubicle standing and plan 2 provides a loose-house arrangement. Where a bull is not housed permanently loose housing as shown in plan 3 is adequate.

5. Concrete Specification

5.1 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). It 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 for inspection upon completion of the works.

5.2 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 (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.

5.3 Concrete

For the purpose of construction of bull housing facilities, 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.

Note: Where silage effluent is allowed into a slurry tank the effluent shall discharge via a pipe at least 300mm from the inner face of the tank wall.

5.4 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 but they are not a substitute for structural reinforcement. 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 5.1) 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.

5.5 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).

5.6 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.

5.7 Tests

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

5.8 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.

6. Structure

6.1 Roof Structure

All roof structures shall comply with Department of Agriculture's specification S101. Alternative proprietary construction systems (e.g. of protected timber) may be used if such systems have received the prior acceptance of the Department. 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.

6.2 Roof and Side Cladding

Cladding materials and their installation shall conform to the current edition of S102. Slates or tiles may be used, installed according to manufacturer's instructions.

6.3 Foundations

Foundations shall be excavated to a depth of 600mm below original ground level or until firm strata is encountered. Footings shall be 225mm thick and as wide as the wall to be carried plus 225mm on each side.

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.

6.4 Floors

Solid Floors shall be a minimum 125mm concrete laid smooth with a non-slip finish. The finish shall be rough tamped, not smooth. A minimum 150mm 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 concrete. The polythene membrane shall be taken up along walls to meet DPC where this has been installed.

The floors shall be laid to drainage falls of 1: 60 discharging to trapped gully. Concrete shall comply with Clause 5 above.

6.5 Walls

Walls to the bull pen and to the exercise area shall be 200mm mass concrete. The minimum height from floor to roof of pen shall be 3.0m and the height of wall to exercise area shall be 1.35m. A tubular steel railing 450mm high, with either 2 or 3 horizontal rails, shall be mounted on top of the exercise area walls. Ramps to service pen, if required, shall be 225mm wide, about 1.4m long, 600mm high at lower end, 900mm at the higher end with the width between ramps 525mm to 600mm.

The use of blockwork walls in a bull pen is not permitted.

6.6 Doors

A sliding door shall be fitted to the feed opening. The door shall be either 50mm thick framed, braced and sheeted or angle iron framed and galvanised iron clad.

6.7 Feed Barrier

The feed barrier shall consist of a stub wall 300mm high and of, at least, 150mm mass concrete, with a tubular steel barrier (of at least 80mm OD by 4mm thick wall) incorporating a tying yoke fixed over the wall. This yoke shall be capable of being operated from outside the building, when the bull is feeding.

6.8 Support for Water Bowl

A solid support of mass concrete shall be provided to the water bowl or trough, which shall be a minimum of 1.0m over floor level. The water bowl shall be located where it can be cleaned without entering the enclosure.

7. Special Safety Features

An escape barrier, see Figure 1, shall be provided at one of the blind corners in the exercise area in Plans 1 and 2 and in the loose house section in Plan 3. Drop gate referred to in Clause 3, and shown on drawing, see fig 2, shall be raised and lowered from outside the pen by a chord over a pulley as shown on Section A-A.

8. Steelwork

All tubular steelwork shall be carefully manufactured and erected. All gates shall be securely hung and fitted with 2 animal proof and child proof closers, one near the top, and one near the bottom of the gate. Framing to gates shall be of 50mm diameter heavy gauge tubing, with 38mm heavy gauge vertical fill bars not more than 100mm apart. Gate posts shall be 125mm heavy gauge tubular steel or IPE Section 160. Tubular steelwork to service pen shall be 50mm diameter heavy gauge welded to end posts as specified for gates. Alternatively, a proprietary tubular crate with side opening and ramps may be provided. Tubular steel railings over exercise yard walls shall be 40mm heavy gauge secured to wall by verticals at 1.8m centres fixed 225mm into the wall. Drop gate shall be framed with 50mm heavy gauge box section steel and shall slide in a steel U channel with 75mm spacing between 50mm lugs. Channels shall be securely fitted to walls.

9. Water Supply

A piped water supply shall be provided to a drinking bowl or trough erected as specified at clause 5.4. All exposed pipework shall be insulated with waterproof insulation.

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.

10. Waste Disposal

All effluent and washings from the pen and exercise yard shall be channelled to a trapped gully within or directly outside the enclosure and piped to the existing wastewater disposal system or new storage tank. All solid farmyard manure, slurry and soiled water shall be stored in compliance 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.

11. Artificial Lighting

Artificial lighting to 50-lux level shall be provided. All electrical fittings shall be installed and provided as per Department of Agriculture, Food and the Marine specification S101.

12. Protection of Steelwork

For protection of Steelwork refer to Department of Agriculture, Food and the Marine specification S101.

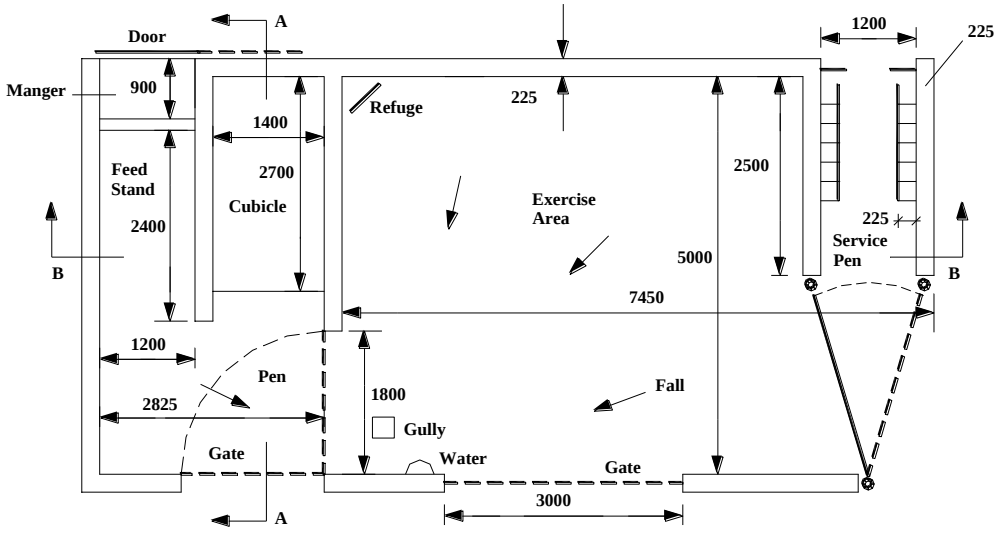

Figure 1 Plan 1

Notes:

1. The location of the different elements within the bull enclosure may be switched around to suit the particular site.

2. A wall 1.8m high may be substituted for wall 1.35m high and railings 0.45m high shown to exercise area in Section B-B.

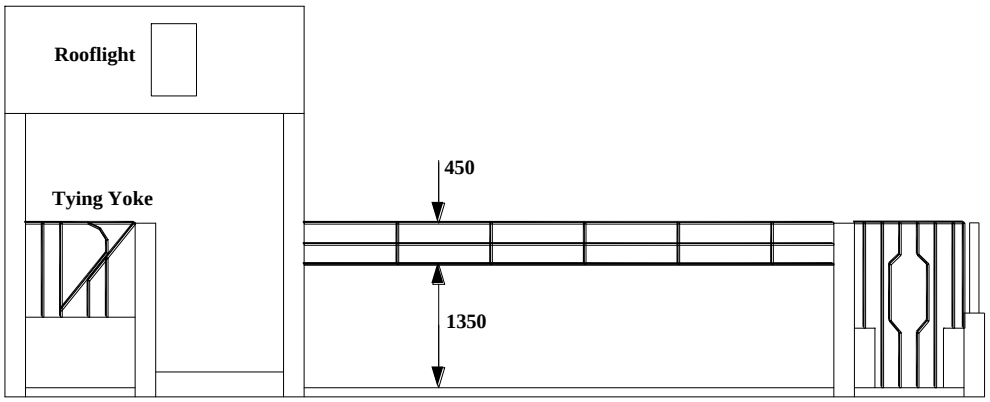

Figure 2 Section B-B

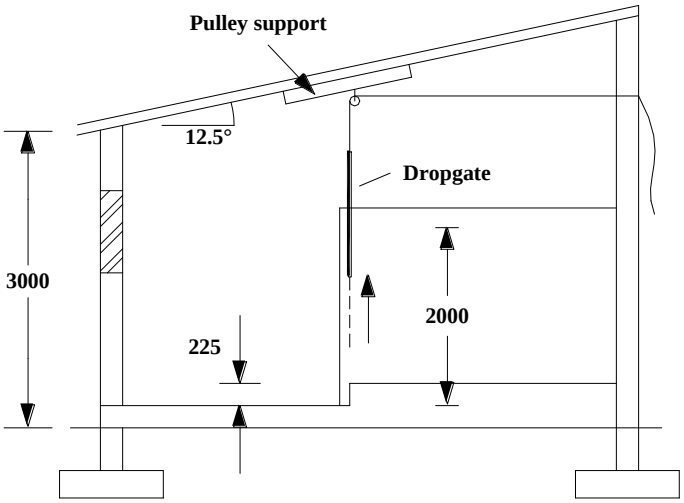

Figure 3 Section A-A

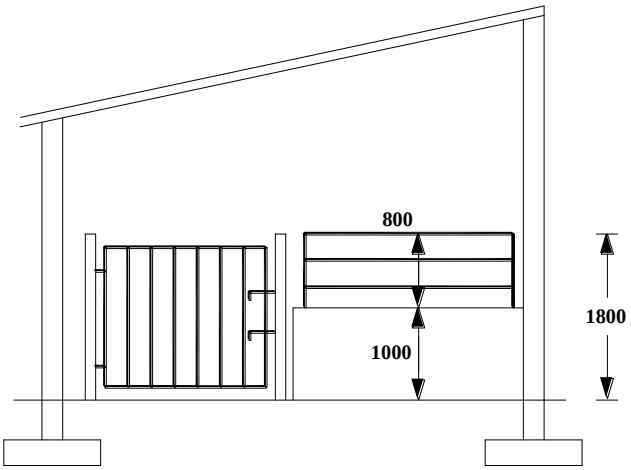

Figure 4 End Elevation to Plan 1

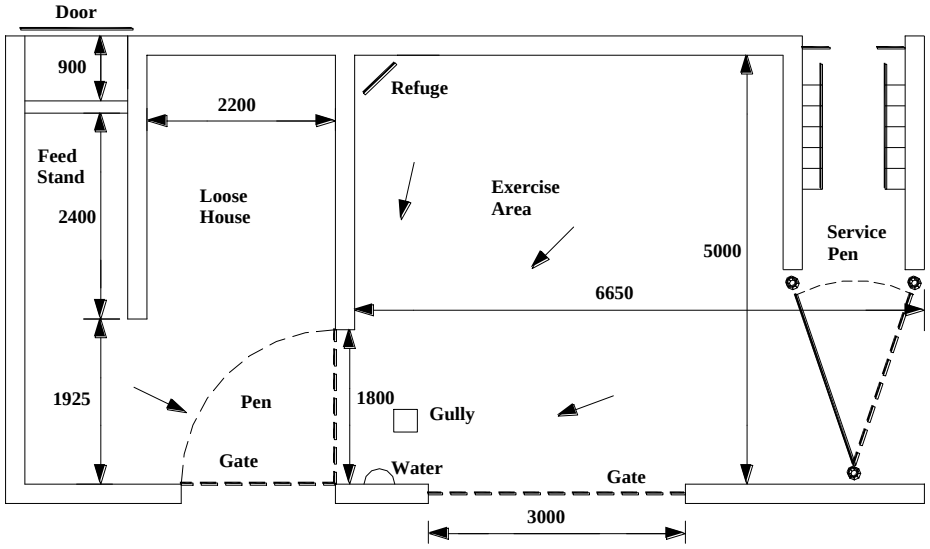

Figure 5 Plan 2

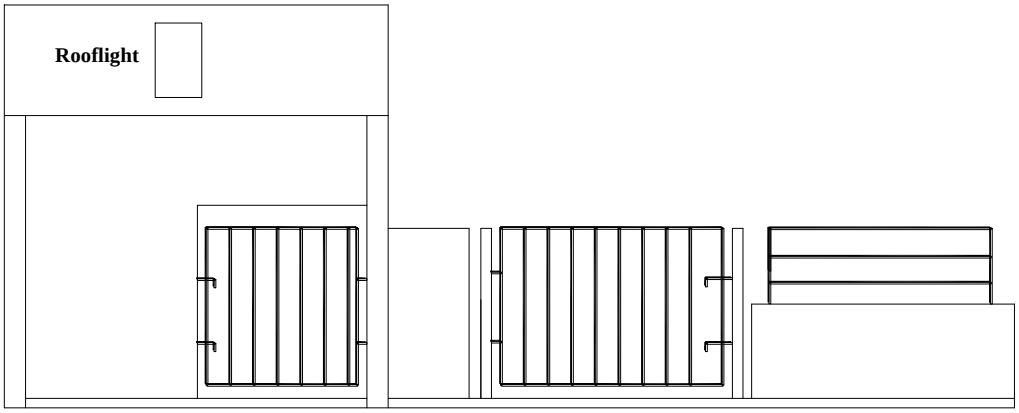

Figure 6 End Elevation to Plan 2

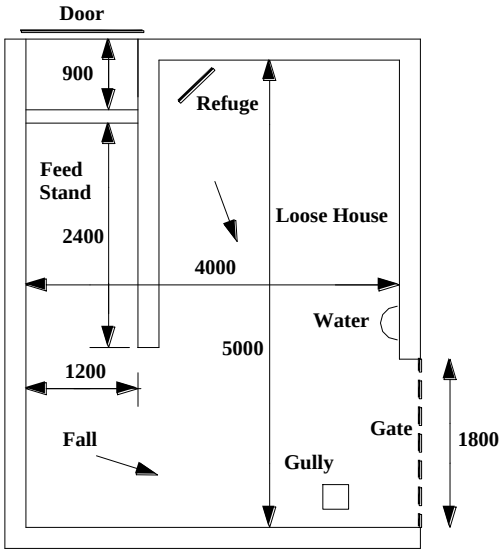

Figure 7 Plan 3

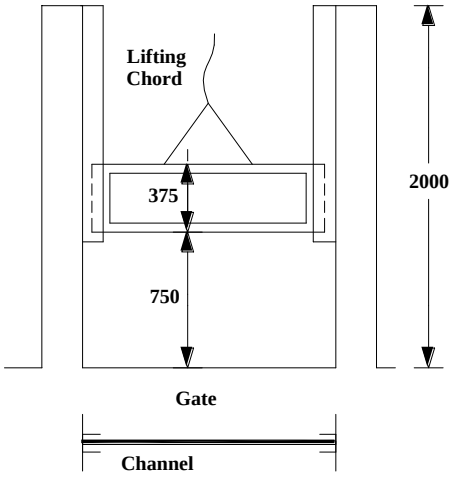

Figure 8 Dropgate (see Fig. 3)

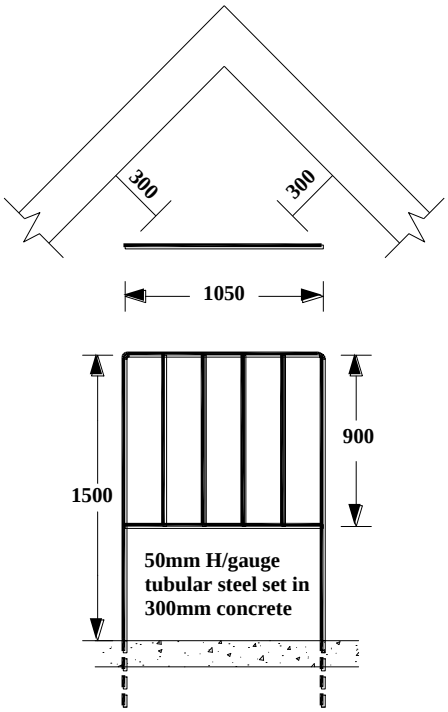

Figure 9 Refuge