S 148
August 2019

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

MINIMUM SPECIFICATION FOR FARM FENCING

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 Website (www.agriculture.gov.ie) under, farmerschemespayments/farmbuildings/]. Similarly, references to Standards are to the current edition of the Irish, British or European Standard, as appropriate.

All materials used in fencing shall be sourced as new.

This specification is arranged as follows:

A GENERAL

A.1 Safety

A.1.1 Responsibility for Safety

Applicants are reminded that they have duties 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 and also when undertaking building works. 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.

A.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.

B Requirements for Timber Posts and Rails

B.1 Timber Standard:

Timber used in horse fencing shall meet the requirements of IS437, as and from 1st March 2008 be and certified as such by the NSAI or equivalent Body (e.g. BSI).

Timber used in cattle, deer, sheep and goat fencing shall meet the requirements of IS436, as and from 1st March 2008 and be certified as such by the NSAI or equivalent Body (e.g. BSI).

B.1.1 Permitted species

Timber for posts and rails for all fencing shall be chosen from species in accordance with Table 1.

Table 1 — Permitted species

Species	Post	Rail
Douglas fir – Pseudotsuga menziesii	Permitted	Permitted
Larch – Larix spp.	Permitted	Permitted
Lodgepole pine – Pinus contorta	Permitted	Permitted
Scots pine – Pinus sylvestris	Permitted	Permitted
Oak – Quercus spp.	Permitted	Permitted
Spruce – Picea sitchensis, Pinus abies	Permitted for deer, goat and sheep fencing only	Permitted

B.1.2 Grading

Timber posts shall meet the requirements in Table 2A and Table 2B and Figure 1 when graded in accordance with I.S 127.

Table 2A — Grading requirements

Characteristics	Permissible limits
Knots	Total Knot Area Ratio (KAR) not greater than ½
Slope of grain	Not exceeding 1 in 6
Wane	Up to ¼ of face or edge over full length and can be up to ⅓ in any 300 mm length for Horse fencing timbers. For deer, sheep and goat fencing timbers the wane shall not exceed 1/3 of face or edge over full length (rectangular sections only)
Sapstain	Permitted
Decay	Not permitted
Active insect attack	Not permitted
Surface condition	Free from extraneous matter for example water, mud, dirt and largely free from inner or outer bark.

B.1.3 Moisture content

After drying and immediately prior to preservative treatment, the moisture content of posts for sheep, deer and goat fencing shall not exceed 28%, when measured in accordance with **I.S. 436**.

After drying and immediately prior to preservative treatment, the moisture content of posts and rails for horse fencing shall not exceed 26%, when measured in accordance with **I.S. 437**.

Table 2B— Additional requirements for Horse fencing timbers

Characteristics	Permissible limits
End splits	Not longer than 150 mm
Fissures	Total depth of fissure not greater than ½ the thickness
Distortion	See Figure 1
Bow	Maximum 25 mm over 3000 mm
Spring	Maximum 15 mm over 3000 mm
Twist	Maximum 20 mm over 3000 mm
Cup	Not greater than $^{1}/_{25}$ of the width

B.1.4 Preservation of timber pieces

Oak may be used untreated, but, if so, shall be free of sapwood. For all other permitted species, pieces of the correct moisture content and dimensions, shall be treated in accordance with I.S. 436 or I.S. 437, and as and from 1st March 2008 shall be certified to be in compliance with the relevant standard by the NSAI.

All timber used in fencing and gates for horses shall be treated with creosote. No other preservative is acceptable for grant-aided horse fencing.

Brush on treatment of any preservative is not acceptable.

B.1.5 Marking

B.1.5.1 Intermediate posts

Intermediate posts shall be labelled by the bale. Each bale shall be labelled with the label containing the following information at a minimum:

Manufacturer's details, bale number, number of pieces in bale, piece dimensions, date of labelling, verification of final inspection, Irish Standard number.

B.1.5.2 Straining Posts

Straining posts shall be individually marked with a unique number, which can be fully traced back to the manufacturer. Each bale of straining posts shall also be labelled as for intermediate posts.

B.1.5.3 Certificate for Posts

A "fencing post certificate" shall be completed for all applications for grant aid involving timber fencing posts. Section A is to be completed by the post manufacturer. Section B is to be completed by the supplier of the posts to the farmer. The farmer shall submit the completed certificate together with the standard paperwork for grant aid. The certificate is to be produced in duplicate, with the IS 436 or IS 437 registration holder holding the original copy, and supplying the second copy to the person/company purchasing the posts.

The Department of Agriculture, Food and the Marine has developed an accepted "fencing post certificate" and companies certified to IS 436 or IS 437 can apply to the Department of Agriculture, Food and the Marine for details of the certificate template and also their unique numbers for the certificates. The certificate template and certificate numbers can be obtained from the Engineering Unit, Nitrates, Biodiversity and Engineering Division, Department of Agriculture, Food and the Marine, Pavilion A, Grattan Business Centre, Dublin Road, Portlaoise, Co. Laois. An application for certificates must be made in writing, including evidence of certification to IS 436 or IS 437. Only companies that are certified by the NSAI, or equivalent, to produce IS436 or IS 437 posts will be supplied with the certificate template and corresponding numbers.

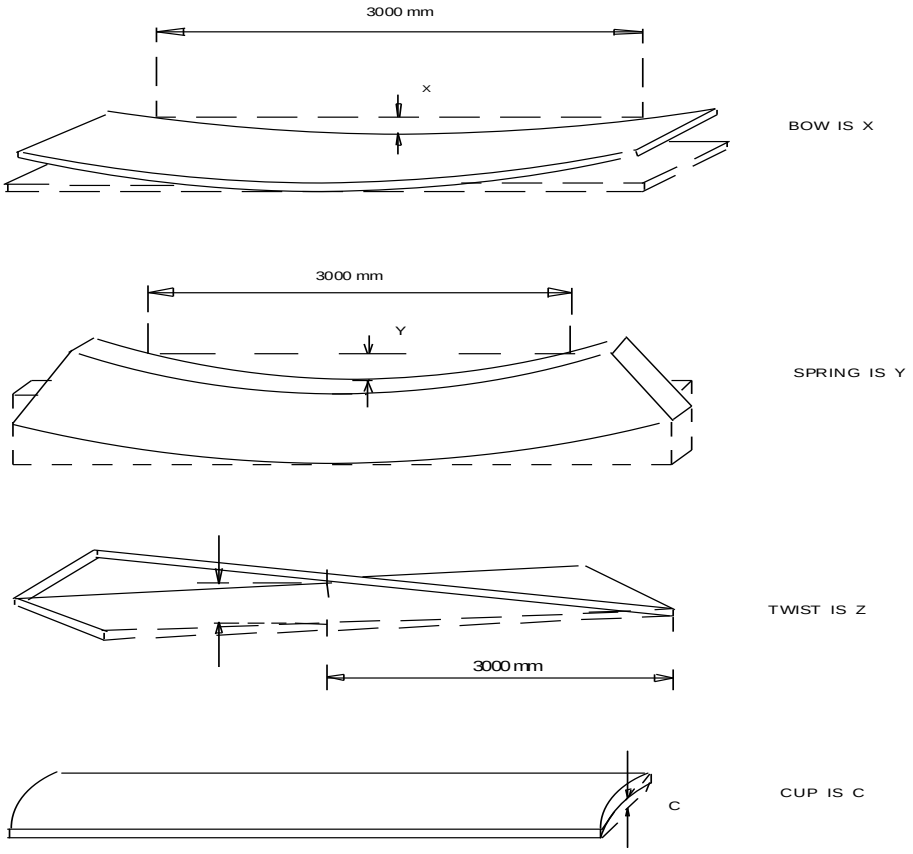

Figure 1 — Timber post and rail horse/stud fencing - measurement of bow, spring, twist and cup

C Requirements for Non-Timber Posts and Rails

C.1 Concrete Posts

Fencing posts and gate posts manufactured from concrete may be used in place of timber posts under the following conditions:

1. The intermediate posts shall be at least as long as the timber posts specified for the fence.
2. The strainer posts shall be, at least, 94% as long as the timber posts and shall be braced by struts along the fence line. Where the fence is running on two sides of a strainer, then struts shall be placed on both sides of the strainer.
3. The posts shall be produced using, at least, C35/45 concrete with a maximum water cement ratio of 0.40 and a minimum cement content of 400 kg/m^3.
4. All posts shall have suitable reinforcement for the entire length of the post.
5. The posts shall be produced in accordance with I.S. E.N. 12839:2012.
6. All posts shall be guaranteed by the manufacturer for a minimum of 10 years for the fence types described in this specification.
7. All post manufacturers shall be listed on specification S.148A: Accepted Fencing Post Suppliers.

C.2 Alternative Materials

Fencing posts and gate posts manufactured from materials other than concrete or timber shall be certified to be at least as strong as new timber posts of the required size that are certified to IS 436. The posts shall be of at least the same dimensions as timber posts. These posts shall require prior acceptance by the Department of Agriculture, Food and the Marine and shall be listed on specification S.148A: Accepted Fencing Post Suppliers.

D Fence Erection techniques

D.1 Line and level

The fence shall be erected so that on completion the posts are located along the designated fencing line and the posts follow a smooth alignment. The finished fence shall follow approximately the profile of the ground.

D.2 Setting out

The posts shall be accurately set out such that no rails, where possible, need to be cut or altered on site. Any length of fencing, including branches or spurs, shall start and end with a straining post.

D.3 Existing fences and openings

All new fencing shall be neatly and effectively joined to existing walls and fences. Where necessary, openings shall be left for gates.

D.4 Cutting of members on site

Where cutting of members is unavoidable because of openings, walls or obstructions, the cut ends shall be treated with two liberal coatings of compatible preservative to achieve the necessary level of preservation. Where cutting of posts is unavoidable, the top end of the post shall always be cut.

D.5 Posts

Where posts are to be installed by driving, the post bases shall be pointed. Where posts are to be placed by excavation, the post bases shall be flat. The base of the post for horse fencing shall be supplied four-way pointed.

D.6 Driving of posts

The posts shall be driven using a purpose built post driver such that on completion of driving, the fence shall remain stable and upright and within a tolerance of ± 25mm/metre length for the vertical. In order to protect the post from damage, the driving weight shall impact directly on the post top. In cases where the post driver does not have a jockey post cap as normal equipment, a purpose built steel cap shall be provided and moved from post to post as driving proceeds. For horse fencing, where rock or other obstructions are encountered the post shall be set in concrete. The concrete base shall be 600 mm deep for boundary and paddock fencing and 900 mm deep for lunging and turnout areas.

Where fences are for other than horses, posts may be placed in augered holes rather than driven.

D.7 Fixing to posts

D.7.1 Wire fixing

Wire should be fixed with galvanised or zinc / aluminium coating staples. To prevent splitting of the post, staples should be driven at an angle and staggered along the length of the post. Staples should not be driven home fully as such staples will inhibit movement of the fencing wire and will damage the galvanised or zinc / aluminium coating coating. Where intermediate strainers are required for long fence runs with sheep mesh, all horizontal wires in the sheep mesh shall be secured to each intermediate strainer using staples or if desired the wire may be tied off at each strainer.

D.7.2 Nailing of rails and top boards to posts

Rails and top boards shall be fixed to the field side of posts. The top of the rail should always finish flush with the top of the post. Rail and top board joints shall be staggered so that only alternate joints occur on one post. They shall be butt jointed along the centreline of each of the posts. Each rail or top board shall be fixed to each post with two nails driven in on the skew by hand or mechanical means. Rails or top boards which split during railing are not permitted. Where splitting of the rails or top boards is encountered, it is recommended that all remaining rails and top boards shall be pre-drilled.

E Ancillary items

E.1 Fixings

E.1.1 Metal fixing issues:

Metal fixings shall not be attached to treated timber until 14 days after treatment or until the moisture content has fallen below 20%.

NOTE When attaching metal fixings to treated timber refer to the wood preservative manufacturer's instructions.

E.1.2 Nails for deer and cattle fencing

Nails shall be galvanised or zinc / aluminium coating plain round head steel nails to IS EN 14592. The coating shall comply with I.S. EN ISO 1461.

E.1.3 Nails for horse fencing

Nails shall be, at least, 100 mm long and 4.2 mm diameter steel nails to I.S. EN 10230-1.

E.1.4 Staples

Staples shall be galvanised or zinc / aluminium coating, minimum 40 mm x 3.55 mm round standard or barbed to IS EN 14592. The coating shall comply with I.S. EN 10244-2.

E.1.5 Hog rings

Hog rings shall be not less than 1.5 mm diameter. The coating shall comply with I.S. EN 10244-2.

NOTE 1 Hog rings manufactured from alternative materials, and/or coatings, may be acceptable provided they give equivalent or improved levels of performance or protection.

E.1.6 Electric fence insulators

Terminal insulators shall be egg type, heavy duty. Intermediate insulators can be either light duty screw in type; heavy duty ring type; insulated nail type, or plain staple combined with a short length of 12mm Heavy Duty Polythene Pipe.

E.2 Wire

E.2.1 Line wire

Line wire shall be a minimum 2.5 mm galvanised or zinc / aluminium coating or zinc/aluminium coating nominal diameter high tensile fencing wire to B.S. 4102. The coating shall comply with I.S. EN 10244-2 (Galvanised to Class A or Class B using a Galfan type alloy).

E.2.2 Tensioning wire

Tensioning wire shall be 3.15 mm diameter galvanised or zinc / aluminium coating mild steel wire to B.S. 4102. The coating shall comply with I.S. EN 10244-2 (Galvanised to Class A or Class B using a Galfan type alloy).

E.2.3 Tying wire

Tying wire shall be 1.6 mm diameter galvanised or zinc / aluminium coating mild steel wire to B.S. 4102. The coating shall comply with I.S. EN 10244-2 (Galvanised to Class A or Class B using a Galfan type alloy).

E.2.4 Barbed wire

Barbed wire shall be formed of two number min. 1.6 mm high tensile line wires, to I.S. EN 10223-1. Alternatively, the wire may be formed of two number min. 2.0 mm high tensile line wires, with a minimum tensile strength of 990N/mm^2 (heavy duty high tensile barbed wire). The coatings of both wires shall comply with I.S. EN 10244-2 (Galvanised to Class A or Class B using a Galfan type alloy). Barb spacing shall comply with I.S. EN 10223-1.

E.2.5 Sheep fencing wire

Sheep fencing wire shall be to I.S. EN 10223-5, minimum class 'medium 2M' high tensile steel. The coating shall comply with I.S. EN 10244-2 (Galvanised to Class A or Class B using a Galfan type alloy). Sheep wire shall be a minimum of 800mm high, with a minimum of 8 horizontal wires. The maximum opening size at the bottom of the sheep wire shall not exceed 225mm width x 90mm height, while the maximum opening at the top of the sheep wire shall not exceed 225mm x 185mm (care should be taken in selecting the width of the wire opening to suit the particular need). The fence shall be constructed of high tensile wire (I.S EN 10223-5) with a minimum diameter of 2.5mm.

For sheep fencing constructed strictly on **banks or stone walls** the sheep wire shall be a minimum of 500mm high. The maximum opening size at the bottom of the sheep wire shall not exceed 225mm width x 130mm height, while the maximum opening at the top of the sheep wire shall not exceed 225mm x 160mm (care should be taken in selecting the width of the wire opening to suit the particular need). The fence shall be constructed of high tensile wire (I.S EN 10223-5) with a minimum diameter of 2.5mm. The sheep fencing wire shall be to I.S. EN 10223-5, minimum class 'medium 2M' high tensile steel. The coating shall comply with I.S. EN 10244-2 (Galvanised to Class A or Class B using a Galfan type alloy).

E.2.6 Monofilament

Monofilament strands shall have the following characteristics:

4 mm minimum diameter with a minimum breaking strain of 500 kg and minimum breaking elongation of 20%.

E.2.7 Specialised horse wire

Specialised horse wire shall consist of a minimum 13 line wires of, at least, 2.7mm diameter or 2.5 mm high tensile galvanised or zinc / aluminium coating wire, galvanised or zinc / aluminium coating to I.S. E.N 10244-2 (Galvanised to Class A or Class B using a Galfan type alloy) steel wires. Vertical wires shall be at least 2mm diameter. Mesh openings shall not exceed 75 mm x 75 mm, either in V-formation or rectangular formation. The top and bottom members are recommended to be at least 3.5mm diameter galvanised or zinc / aluminium coating steel wires.

E.2.8 Electrified Horse tape

Electrified Horse tape shall be at least 40 mm wide, and shall be made of plastic with sufficient suitable wire conductors through out its length to carry the current.

E.2.9 Horse Rope

Horse Rope shall be, at least, 5mm diameter of either rope or plastic with suitable wire conductors throughout its length.

E.2.10 Rectangular Wire Mesh for Deer fencing

Rectangular wire mesh shall be formed of zinc-coated high tensile horizontal line wires with a minimum diameter of 2.5mm, and zinc-coated mild steel vertical wires with a minimum diameter of 2.5mm. It shall comply with EN10223-2 (Galvanised to Class A or Class B using a Galfan type alloy). Joint knotting shall either be hinged-joint or tight-lock knotting.

E.2.11 Galvanised or zinc / aluminium coating Wire-Joiners for Deer fencing

Galvanised or zinc / aluminium coating wire-joiners or connectors shall be of a type approved by the manufacturers of the mesh.

E.2.12 Chain Link Mesh for Deer fencing

Chain link mesh shall be zinc-coated and/ or plastic-coated, and shall conform to I.S. EN10223-2 (Galvanised to Class A or Class B using a Galfan type alloy) and EN 10223-6 respectively.

E.2.13 Mesh for Poultry fencing

Poultry fencing wire shall be to I.S. EN 10223-5, minimum class ‘medium 2M’ high tensile steel. The coating shall comply with I.S. EN 10244-2 (Galvanised to Class A or Class B using a Galfan type alloy). Poultry wire shall be a minimum of 1500mm high, with a minimum of 15 horizontal wires. The maximum opening size at the bottom of the poultry wire shall not exceed 90mm width x 90mm height, while the maximum opening at the top of the mesh shall not exceed 90mm wide.

E.2.14 Mesh for Pig fencing

Pig fencing wire shall be to I.S. EN 10223-5, minimum class ‘medium 2M’ high tensile steel. The coating shall comply with I.S. EN 10244-2 (Galvanised to Class A or Class B using a Galfan type alloy). Pig wire shall be a minimum of 800mm high, with a minimum of 8 horizontal wires. The maximum opening size at the bottom of the sheep wire shall not exceed 90mm wide x 90mm high, while the maximum opening at the top of the sheep wire shall not exceed 90mm x 185mm. The fence shall be constructed of high tensile wire (I.S EN 10223-5) with a minimum diameter of 2.5mm.

E.3 Electric Fencers

Where electric fences are to be installed, they shall be powered by mains driven electric fencers. Battery powered fencers are not permitted for grant-aid.

E.3.1 Electric fencing energisers

The electric fence energisers shall comply with I.S. EN 60335–2-76:2005/A11.

E.3.2 Installation requirements for mains-operated electric fence units and fence wire

Mains-operated electric fence units shall be installed in accordance with Section 705-555.03 of ET101 (National Rules for Electrical Installations) and the fence wire installed in accordance with Annex 705 B of ET101.

F Fencing layout

F.1 Deer Fencing

Wire fencing shall be constructed using rectangular wire mesh as specified in clause E.2.10 above. Chain link mesh (E.2.12), suitably strengthened, may also be used.

F.1.1 Perimeter Fencing

Perimeter fencing using rectangular wire mesh shall be 1.9m high formed of 13 horizontal wires, with suitably graded spaces becoming smaller nearer the ground. There shall be a maximum space of 150mm between the vertical wires.

F.1.1.1 Perimeter Fencing for Fallow and Sika Deer

Perimeter fencing for Fallow and Sika Deer using rectangular wire mesh shall be 1.9m high formed of 17 horizontal wires with suitably graded spaces and a maximum space of 150mm between the vertical wires.

Alternatively a fence of 13 horizontal line wires may be used together with a properly attached chain link mesh 600mm high up from ground level.

F.1.1.2 Perimeter Fencing using Chain Link Mesh

Perimeter fencing using chain link mesh shall be 1.9m high with at least four zinc-coated high tensile horizontal line wires, diameter 3.15mm, I.S. EN10223-2 (Class A & Class B), fixed at equal intervals. The mesh shall be firmly fixed to the line wires with 2mm diameter galvanised or zinc / aluminium coating or plastic-coated mild steel tying wires I.S. EN10223-2 (Class A & Class B).

F.1.2 Raceway Fencing

Raceway fencing shall conform to standards for perimeter fencing. Raceways subject to constant use should preferably be fenced with tight lock mesh.

F.1.3 Internal Fencing

Internal fencing shall normally be as perimeter fencing. However when only finishing deer are farmed (i.e. no breeding herd) then electrified paddock fences may be used for internal fencing. They shall be 1.6m high and shall consist of an 800mm high rectangular wire mesh fence (sheep fence) with at least 3 electrified lines above, one of which shall be an electrified tape (horse tape) at least 25mm wide. The first row of wire shall be 300mm from the top of the sheep wire and remaining 2 wires at 200mm spacing. Intermediate posts shall be 2200 mm in long and a minimum of 100 mm in diameter and shall be driven at least 600 mm into the ground. Intermediate posts shall be spaced at no more than 5m intervals.

F.1.4 Posts and Straining Frames

F.1.4.1 Geometry of posts

Where posts are to be installed by driving, the post bases shall be pointed. Where posts are to be placed by excavation, the post bases shall be flat.

F.1.4.2 H-Frames or Straining Frames

H-frames or straining frame shall be constructed at each end of a run of deer fencing, at each acute change of direction (more than 30°), and as interval frames in any run exceeding 200

metres. The frames shall be constructed as shown in figure E.1.1. The vertical posts shall be not less than 3 metres long, and shall be driven 1m into the ground or placed in an augured hole. They shall have a diameter of not less than 200mm and shall be positioned at least 2m apart. The horizontal post shall have a diameter of not less than 125mm and shall be securely fixed to the verticals by either galvanised or zinc / aluminium coating steel rods, or by a rebated joint. Horizontal line wires as specified above shall be securely fixed to the outer post of the H-frame. Each line wire shall be taken round this post and fastened to itself either by tying, or by a pre-formed fenced connector. The entire fence shall then be strained and stapled in accordance with the specifications of the mesh manufacturer.

The diagonal tensioning wire of the H-frame shall be 3.15mm diameter, and meet the requirements of BS 4102.

F.1.4.3 Straining Posts

Straining posts may be used for changes in the direction of the fence of less than 30o. The posts shall be not less than 3 metres long, with a diameter of not less than 225mm and driven lm into the ground or placed in an augered hole.

F.1.4.4 Intermediate Posts

Intermediate posts shall be 3m long, with a diameter of not less than 125mm and driven 1m into the ground or placed in an augered hole. They shall be spaced at a maximum distance of 8 metres for standard fencing and 6 metres for raceways. In rough terrain, the distances between posts should be appropriately reduced.

Note: in very mountainous terrain, or exceptionally stony ground, post-holes my have to be dug rather than augered. Holes shall be as small as is practicable and after insertion of the post, the earth shall be backfilled and rammed hard.

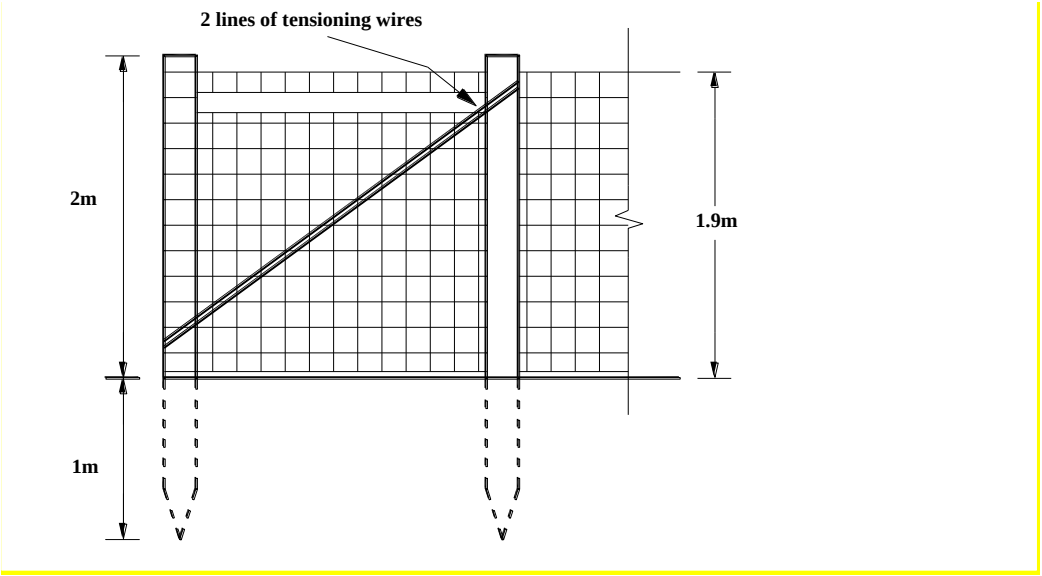

Figure E.1.1 H-Frame

F.1.5 Gates

Gates shall be medium-duty type, either of galvanised steel, or of fully treated timber, suitably constructed and braced. They shall be at least 3m wide and 1.9m high. If they are

also used as entrance gates from a public road they shall be at least 3.6m wide and shall open inwards.

F.1.5.1 Steel Gates

Steel gates shall be formed of fully galvanised tubular steel with an outside diameter of 33.7x3mm. Tubular steel should preferably be bent at each corner and welded to form the frame. Alternatively, welded mitred square joints at corner may be used.

Gates may be constructed using an infill of rectangular wire mesh or chain link mesh exactly as specified for perimeter fencing per section F.1.1 above. In this case, the gate shall be diagonally braced as shown in Figure E1.2 and E1.3, using 32mm tubular steel. Gates may also be formed with an infill of rigid galvanised steel mesh. Spaces between the mesh shall not be greater than specified for perimeter fencing.

F.1.5.2 Timber Gates

Timber gates shall be formed of treated timbers. Frame and bracing timbers shall be at least 100mm x 38mm. Diagonal bracing shall be as in Figure E1.3.

Gates may be constructed using an infill of rectangular wire mesh or chain link mesh exactly as specified for perimeter fencing per F.1.1 above. The gates (with the same bracing) may also be constructed using laths, horizontal timber laths at least 75mm x 25mm with a maximum space of 75mm between the laths.

F.1.5.3 Gate Posts

Gateposts shall either be the outer post of an H-frame or a straining post as previously specified. All hinges, sockets, and sliding bolts shall be fully galvanised.

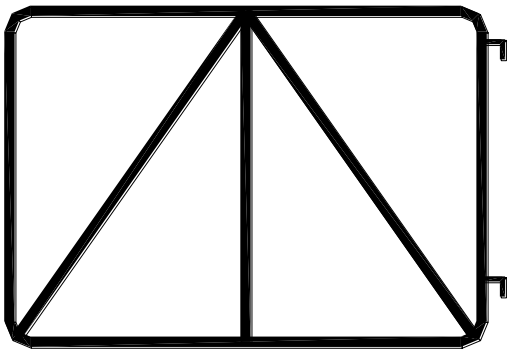

Figure E1.2 Construction of Steel Gates

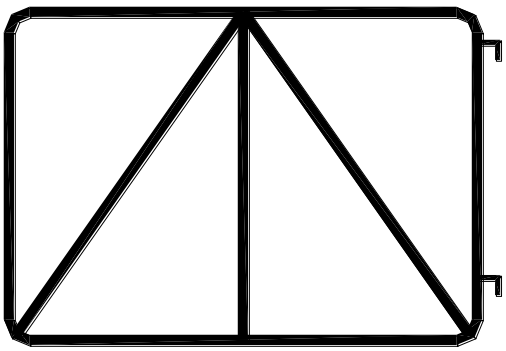

Figure E1.3 Construction of Steel Gates (Pattern for Timber Gates)

F.2 Horse fencing

The following types of horse fencing are covered by this specification:

1. Post and Rail fences.
2. Rope and Tape fences.
3. Specialised Horse Chain Link Fence.
4. White Polymer Monofilament Fencing
5. Electrified High Visibility Plastic covered Horse Wire.
6. Proprietary PVC Post and Rail fencing.

For fencing of lunging areas and special exercise areas, see specification S.156.

All posts shall be four-way pointed and all rail ends shall be cut square. In addition all retaining board ends and top board ends shall be cut square.

F.2.1 Post and Rail fencing

All post and rail fencing to be constructed in accordance with Figure E2.1.

F.2.1.1 Boundary

Posts shall be, at least, 150 mm x 75 mm, and shall be, at least, 1.95 m long. The posts shall be erected with at least 600 mm below ground and 1350mm above ground. The maximum spacing of posts shall be 2.4 m. Rails shall be, at least, 100 mm x 47 mm where the posts are spaced at 2.4 m centres and 100 mm x44 mm where the posts are spaced at 2.1 m centres. Where 3 rails are used they shall be spaced at no more than 400 mm centres and where 4 rails are used they shall be spaced at 300 mm centres. Rails shall be on the paddock side of the fence.

F.2.1.2 Paddock

Posts shall be, at least, 125 mm x 75 mm, and shall be, at least, 1.8 m long. The posts shall be erected with at least 600 mm below ground and 1200 mm above ground. The maximum spacing of posts shall be 2.4 m. Rails shall be, at least, 100 mm x 47 mm where the posts are spaced at 2.4 m centres and 100 mm x 44 mm where the posts are spaced at 2.1 m centres. Where 3 rails are used they shall be spaced at no more than 350 mm centres and where 4 rails are used they shall be spaced at 250 mm centres. Rails shall be on the paddock side of the fence.

F.2.2 Rope and Tape fences

Posts shall be at least 1800 mm long and shall be at least 100 mm diameter. The minimum depth below ground shall be 600 mm, with a minimum above ground of 1200 mm. The maximum spacing of the posts shall not exceed 3600 mm for rope and 5000 mm for tape. There shall be at least 2 strands of rope or tape, on the fence. The top tape or rope shall be at least 1100mm above ground level, with a maximum spacing of 600mm between lines of tape or rope.

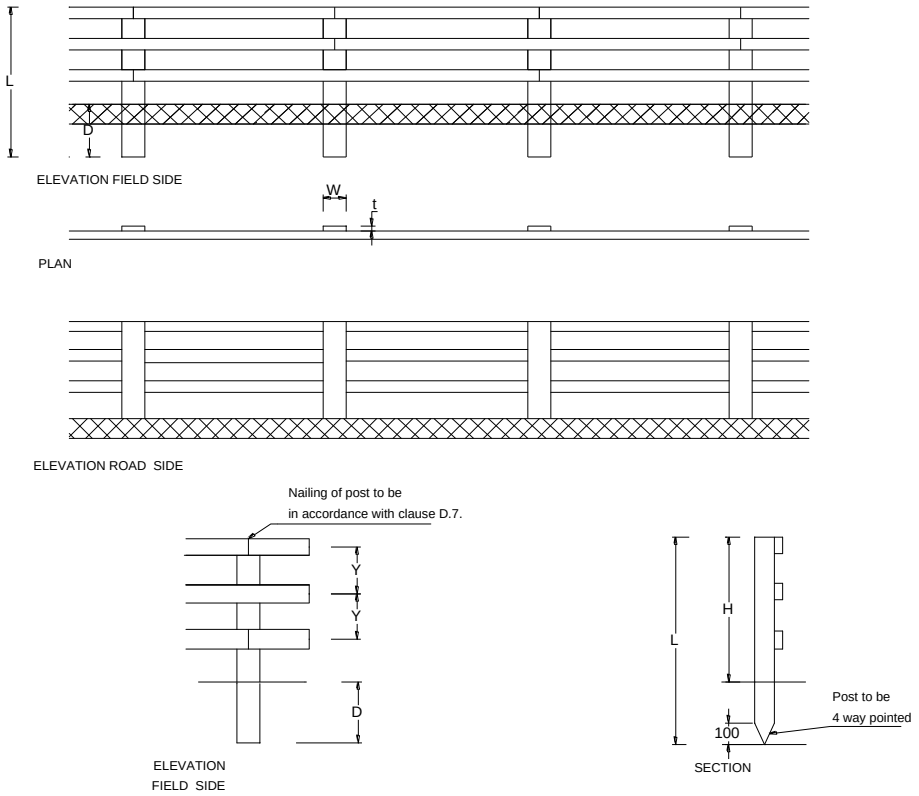

Figure E2.1: Construction details for post and rail fencing

F.2.3 Specialised Horse Wire Fencing

Intermediate post for specialised horse wire fencing shall be at least 2100 mm long and a minimum of 125mm diameter. A minimum of 1500 mm shall be above ground and a minimum of 600 mm shall be below ground. The maximum spacing of intermediate posts shall not exceed 2700 mm where a top board is fitted. Where a top board is replaced by 2.5 mm high tensile wire intermediate post spacing may be increased to 4m.

Strainer posts shall be at least 2700 mm long, and shall be at least 200 mm diameter. A minimum of 1500 mm shall be above ground and a minimum of 1200 mm shall be below ground. Strainer posts shall be spaced at a maximum of 150m. In soft ground, the strainer length may have to be increased to provide the necessary stability. Strainers shall be provided at the beginning and end of every length of fencing, at gaps or openings, at every change of direction where the angle is greater than 30º and to accommodate any significant change in gradient.

Top boards shall be at least 5400mm long and at least 175 mm x 40 mm.

The top board shall be located at the top of the fence posts, and the specialised horse wire, as described in clause C.2.7, shall be brought up from ground level to within 225mm of the top rail.

F.2.4 Polymer Monofilament Fence

Posts shall be, at least, 125 mm in diameter, be 2.1 m in length and driven into the ground to give a top strand height of 1.4m. Intervals between posts shall be not greater than 5.5m, and end assemblies shall be H framed.

4mm white monofilament strands shall be used, knotted and tensioned as recommended by the manufacturers. They shall be fixed to posts by either (a) drilling suitably sized holes through the centre of the post, and inserting a sleeve of 12mm PVC tubing, or by using electro staples as in electric fencing. Polymer monofilament strands must be free to slide past or through intermediate posts.

F.2.5 Electrified High Visibility Plastic covered Horse Wire

Posts shall be at least 1800 mm long and shall be at least 100 mm diameter. The minimum depth below ground shall be 600 mm, with a minimum above ground of 1200 mm. The maximum spacing of the posts shall not exceed 5000 mm. There shall be at least 2 strands of wire, on the fence. The top wire shall be at least 1100mm above ground level, with a maximum spacing of 600mm between lines of wire. Strainer posts shall be spaced at a maximum of 100 m, except in cases where the run is straight and free of undulations, in which case the spacing of strainers shall not exceed 350m. In soft ground, the strainer length may have to be increased to provide the necessary stability. Straining posts shall be provided at the beginning and the end of every length of fencing, at gaps or openings, at every change of direction where the angle and is greater than 30^{o} and to accommodate any significant change in gradient. Strainers shall be 1200 mm above ground and at a minimum depth of 900 mm.

F.2.6 Proprietary Fencing systems

Proprietary PVC Post and Rail fencing systems are acceptable when constructed in strict accordance with the manufacturers instructions. These systems shall have the same height and rail spacing as for timber post and rail fences.

These posts shall require prior acceptance by the Department of Agriculture, Food and the Marine and shall be listed on specification S.148A: Accepted non-timber fencing posts in accordance with clause C.2 of this specification.

F.3 Sheep Fencing

The following types of sheep fencing are covered by this specification:

1) 5 stands electric wire
2) 1 strand barbed wire with sheep wire
3) 2 strands barbed wire with sheep wire
4) 1 strand electric wire, plus 1 strand barbed wire with sheep wire
5) 1 strand electric wire and 1 plain wire with sheep wire
6) Bank / Stone Wall reduced height fence
7) 1 strand electric wire with sheep wire
8) 2 strands plain wire with sheep wire

Barbed wire and sheep wire shall be as specified in clauses E.2.4 and E.2.5 respectively.

As part of the TAMS II scheme all fence types, except 5 stands electric wire, are eligible for grant-aid.

F.3.1 5 Stands Electric wire (not currently grant-aided)

Five strands of 2.5 mm high tensile wire shall be used. Line wires shall be strained tightly between straining posts. The top wire shall be 1.1m above ground level, and the bottom line wire shall be 175 mm above ground level, the intermediate wires should then be spaced out between the top and bottom wires.

Strainer posts shall be, at least, 2100 mm long and a minimum of 175 mm diameter and shall be driven at least 900 mm into the ground. Strainers shall be provided at the beginning and end of every length of fencing, at gaps or openings, at every change of direction where the angle is greater than 30º and to accommodate any significant change in gradient. Where long runs of fencing are to be erected, the maximum distance between strainer posts shall not exceed 150 m, except in cases where the run is straight and free of undulations, in which case the spacing of strainers shall not exceed 500m. In soft ground, the strainer length may have to be increased to provide the necessary stability.

Intermediate posts shall be, at least, 1800 mm long and a minimum of 100 mm diameter and shall be driven at least 600 mm into the ground. Intermediate posts shall be spaced at no more than 5m intervals.

F.3.2 1 strand barbed wire with Sheep wire

The fence shall have a minimum height of 1000 mm, with the barbed wire set above the sheep mesh. The lowest line of the sheep mesh shall be between 50mm and 100mm above ground level.

Strainer posts shall be, at least, 2100 mm long and a minimum of 175 mm diameter and shall be driven at least 900 mm into the ground. Strainers shall be provided at the beginning and end of every length of fencing, at gaps or openings, at every change of direction where the angle is greater than 30º and to accommodate any significant change in gradient. Where long runs of fencing are to be erected, the maximum distance between strainer posts shall not exceed 100 m, except in cases where the run is straight and free of undulations, in which case the spacing of strainers shall not exceed 350m. In soft ground, the strainer length may have to be increased to provide the necessary stability.

Intermediate posts shall be, at least, 1500 mm long and a minimum of 100 mm diameter and shall be driven at least 450 mm into the ground. Intermediate posts shall be spaced at no more than 5m intervals.

F.3.3 2 strands barbed wire with sheep wire

The top line of barbed wire shall be strained tightly between straining posts and shall be 1.1m above ground level. The other line of barbed wire may be either above or below the sheep mesh. The lowest line of wire (either the sheep mesh or barbed) shall be between 50mm and 100mm above ground level.

Strainer posts shall be, at least, 2100 mm long and a minimum of 175 mm diameter and shall be driven at least 900 mm into the ground. Strainers shall be provided at the beginning and end of every length of fencing, at gaps or openings, at every change of direction where the angle is greater than 30º and to accommodate any significant change in gradient. Where long runs of fencing are to be erected, the maximum distance between strainer posts shall not exceed 100 m, except in cases where the run is straight and free of undulations, in which case the spacing of strainers shall not exceed 350m. In soft ground, the strainer length may have to be increased to provide the necessary stability.

Intermediate posts shall be, at least, 1800 mm long and a minimum of 100 mm diameter and shall be driven at least 500 mm into the ground. Intermediate posts shall be spaced at no more than 5m intervals.

F.3.4 1 strand electric and 1 strand barbed with sheep wire

The electrified line wire shall be strained tightly between straining posts and shall be 1.1m above ground level. The line of barbed wire may be either above or below the sheep mesh. The lowest line of wire (either the sheep mesh or barbed) shall be between 50mm and 100mm above ground level.

Strainer posts shall be, at least, 2100 mm long and a minimum of 175 mm diameter and shall be driven at least 900 mm into the ground. Strainers shall be provided at the beginning and end of every length of fencing, at gaps or openings, at every change of direction where the angle is greater than 30º and to accommodate any significant change in gradient. Where long runs of fencing are to be erected, the maximum distance between strainer posts shall not exceed 100 m, except in cases where the run is straight and free of undulations, in which case the spacing of strainers shall not exceed 350m. In soft ground, the strainer length may have to be increased to provide the necessary stability.

Intermediate posts shall be, at least, 1800 mm long and a minimum of 100 mm diameter and shall be driven at least 500 mm into the ground. Intermediate posts shall be spaced at no more than 5m intervals.

F.3.5 1 strand electric wire and 1 plain wire with sheep wire

The electrified line wire shall be strained tightly between straining posts and shall be 1.1m above ground level. The line of plain wire may be either above or below the sheep mesh. The lowest line of wire (either the sheep mesh or plain) shall be between 50mm and 100mm above ground level.

Strainer posts shall be, at least, 2100 mm long and a minimum of 175 mm diameter and shall be driven at least 900 mm into the ground. Strainers shall be provided at the beginning and end of every length of fencing, at gaps or openings, at every change of direction where the angle is greater than 30º and to accommodate any significant change in gradient. Where long runs of fencing are to be erected, the maximum distance between strainer posts shall not exceed 100 m, except in cases where the run is straight and free of undulations, in which case the spacing of strainers shall not exceed 350m. In soft ground, the strainer length may have to be increased to provide the necessary stability.

Intermediate posts shall be, at least, 1800 mm long and a minimum of 100 mm diameter and shall be driven at least 500 mm into the ground. Intermediate posts shall be spaced at no more than 5m intervals.

F.3.6 Bank / Wall reduced Height Fence

The fence shall have a minimum height of 700 mm with one strand of wire and 800mm with two strands of wire. In all cases at least one strand of wire shall be located above the sheep wire. The lowest line of wire shall be between 50mm and 100mm above the top of the bank / wall.

Strainer posts shall be, at least, 1800 mm long and a minimum of 175 mm diameter and shall be driven / installed at least 900 mm into the bank or stone wall. Strainers shall be provided at the beginning and end of every length of fencing, at gaps or openings, at every change of direction where the angle is greater than 30º and to accommodate any significant change in gradient. Where long runs of fencing are to be erected, the maximum distance between strainer posts shall not exceed 100 m, except in cases where the run is perfectly straight and free of undulations, in which case the spacing of strainers shall not exceed 350m.

Intermediate posts shall be, at least, 1500 mm long and a minimum of 100 mm diameter and shall be driven at least 500 mm into the bank or wall. Intermediate posts shall suitably supported be spaced at no more than 5m intervals.

F.3.7 1 strand electric wire with Sheep wire

The electrified line wire shall be strained tightly between straining posts and shall 1.0 m above ground level. The lowest line of the sheep mesh shall be between 50mm and 100mm above ground level.

Strainer posts shall be, at least, 2100 mm long and a minimum of 175 mm diameter and shall be driven at least 900 mm into the ground. Strainers shall be provided at the beginning and end of every length of fencing, at gaps or openings, at every change of direction where the angle is greater than 30º and to accommodate any significant change in gradient. Where long runs of fencing are to be erected, the maximum distance between strainer posts shall not exceed 100 m, except in cases where the run is straight and free of undulations, in which case the spacing of strainers shall not exceed 350m. In soft ground, the strainer length may have to be increased to provide the necessary stability.

Intermediate posts shall be, at least, 1500 mm long and a minimum of 100 mm diameter and shall be driven at least 450 mm into the ground. Intermediate posts shall be spaced at no more than 5m intervals.

F.3.8 2 strands plain wire with sheep wire

The top line of plain wire shall be strained tightly between straining posts and shall be 1.1m above ground level. The other line of plain wire shall be above the sheep wire, spaced evenly between the top of the sheep mesh and the top line of wire. The lowest line of the sheep wire shall be between 50mm and 100mm above ground level.

Strainer posts shall be, at least, 2100 mm long and a minimum of 175 mm diameter and shall be driven at least 900 mm into the ground. Strainers shall be provided at the beginning and end of every length of fencing, at gaps or openings, at every change of direction where the angle is greater than 30º and to accommodate any significant change in gradient. Where long runs of fencing are to be erected, the maximum distance between strainer posts shall not exceed 100 m, except in cases where the run is straight and free of undulations, in which case

the spacing of strainers shall not exceed 350m. In soft ground, the strainer length may have to be increased to provide the necessary stability.

Intermediate posts shall be, at least, 1800 mm long and a minimum of 100 mm diameter and shall be driven at least 500 mm into the ground. Intermediate posts shall be spaced at no more than 5m intervals.

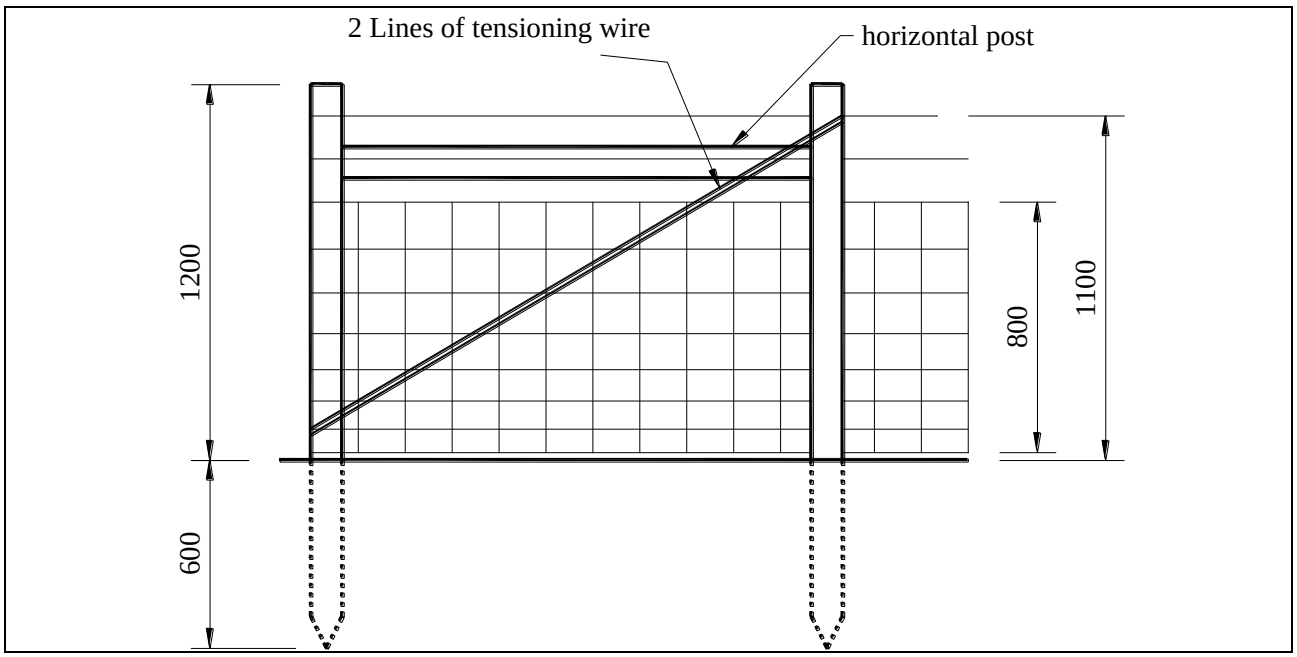

Figure E.3.1 H-Frame

F.3.9 H-Frames in place of straining posts

H-frames or straining frames may be used in place of straining posts were ground conditions prevent strainer posts being properly placed. H-Frames shall be spaced at the same intervals as straining posts. The frames shall be constructed as shown in figure E.3.1. The vertical posts shall be not less than 1800mm long, and shall be driven at least 600mm into the ground or placed in an augured hole. They shall have a diameter of not less than 100mm and shall be positioned at least 1.5m apart. The horizontal post shall have a diameter of not less than 100mm and shall be securely fixed to the verticals by either galvanised or zinc / aluminium coating steel rods, or by a rebated joint. Horizontal line wires as specified above shall be securely fixed to the outer post of the H-frame. Each line wire shall be taken round this post and fastened to itself either by tying, or by a pre-formed fenced connector. The entire fence shall then be strained and stapled in accordance with the specifications of the mesh manufacturer.

The diagonal tensioning wire of the H-frame shall be 3.15mm diameter, and meet the requirements of BS 4102.

F.3.10 Gates for sheep fences

Gates shall only be grant-aided as part of a new sheep fence. Gateways for sheep fencing shall be at least 3.6m wide and the gate shall be, at least, 1.2m high. If they are also used as entrance gates from a public road they shall open inwards. All gates shall be hung using suitably sized proprietary gate hangers and the main frame shall be between 50mm and

100mm above ground level. Each gate shall be fitted with an adequate locking mechanism which shall securely retain the gate closed. All gate hanging posts and closing posts shall be independent of any fence post.

The main frame shall consist of, at least, Circular Hollow Section (tubular) steel with an outside diameter of 41.28 mm and a thickness of 1.5 mm. Alternatively Square Hollow Section steel may be used, of at least 38.1 mm x 38.1 mm x 2.0 mm. The infilling shall consist of, at least, C.H.S. 41.28 mm O.D. x 1.5 mm or S.H.S. 38.1 mm x 38.1 mm x 2.0 mm. The average spacing between horizontal rails shall not exceed 250 mm and no one space shall exceed 300 mm. Where young lambs are to be kept in the field, it is strongly recommend that the lower half of the gate be covered by steel mesh to prevent the lambs from climbing through the gate.

Alternatively, the main frame shall consist of, at least, Circular Hollow Section (tubular) steel with an outside diameter of 41.28 mm and a thickness of 1.5 mm. Alternatively Square Hollow Section steel may be used, of at least 38.1 mm x 38.1 mm x 2.0 mm. The infilling shall consist of, at least, C.H.S. 30.0 mm O.D. x 1.2 mm or S.H.S. 38.1 mm x 38.1 mm x 2.0 mm, with a minimum of 8 horizontal rails and of, at least, C.H.S. 25.0 mm O.D. x 1.2 mm with a minimum of 9 horizontal rails. The maximum spacing between horizontal rails shall not exceed 230 mm and the lower 5 rails shall be spaced at no more than 100mm.

All steel gates shall be hot dip galvanised in accordance with EN 1461.

F.3.11 Gate Posts:

Hanging posts and closing posts shall each be not less than 2.28 m long and shall comprise of one of the following:

(i) Hanging posts of Circular Hollow Section (C.H.S.), of, at least, 114.3 mm outside diameter by 3.6 mm thick and closing posts of at least 88.9mm outside diameter by 3.0mm thick Circular Hollow Section (C.H.S.).
(ii) Hanging posts of Square Hollow Section (S.H.S.), of at least, 100 mm square x 4.0 mm thick and closing posts of at least, 80 mm square x 3.0 mm thick Square Hollow Section (S.H.S.).
(iii) UB or IPE section beams, of at least, 150 mm x 75 mm.
(iv) Timber gate posts shall be, at least, 225mm diameter and not less than 2.40m long and shall be certified in accordance with I.S. 436 as for fencing posts.
(v) Reinforced concrete gate posts listed on S.148A.
(vi) Other gate posts listed on S.148A.

All steel gate posts shall be hot dip galvanised in accordance with EN 1461.

In the case of steel or concrete post, they shall be erected in a neatly excavated post hole not less than 450 mm square or a circular augured hole of 500 mm dia. They shall be surrounded in a concrete base which shall be poured directly against the sides of the excavation. When completed they shall be truly vertical. Timber post may be driven in to ground with a suitable post driver, or erected as above.

F.4 Goat Fencing

This shall consist of a minimum of five strands of electrified wire. The five strands shall be of 2.5 mm high tensile wire in accordance with clause E.2.1. Line wires shall be strained tightly between straining posts. The top wire shall be 1.2m above ground level, and the bottom line wire shall be no more than 175 mm above ground level, the intermediate wires should then be evenly spaced out between the top and bottom wires.

Strainer posts shall be, at least, 2100 mm long and a minimum of 175 mm diameter and shall be driven at least 900 mm into the ground. Strainers shall be provided at the beginning and end of every length of fencing, at gaps or openings, at every change of direction where the angle is greater than 30º and to accommodate any significant change in gradient. Where long runs of fencing are to be erected, the maximum distance between strainer posts shall not exceed 150 m, except in cases where the run is straight and free of undulations, in which case the spacing of strainers shall not exceed 500m. In soft ground, the strainer length may have to be increased to provide the necessary stability.

Intermediate posts shall be, at least, 1800 mm long and a minimum of 100 mm diameter and shall be driven at least 600 mm into the ground. Intermediate posts shall be spaced at no more than 5m intervals.

F.5 Cattle Fencing

F.5.1 Electric fence

One or two strands of 2.5 mm high tensile wire shall be used. Line wires shall be strained tightly between straining posts. The top wire shall be 1.1 m above ground level, and where a second line wire is installed, this shall be at 600mm above ground level.

Strainer posts shall be, at least, 2100 mm long and a minimum of 175 mm diameter and shall be driven at least 900 mm into the ground. Strainers shall be provided at the beginning and end of every length of fencing, at gaps or openings, at every change of direction where the angle is greater than 30º and to accommodate any significant change in gradient. Where long runs of fencing are to be erected, the maximum distance between strainer posts shall not exceed 150 m, except in cases where the run is straight and free of undulations, in which case the spacing of strainers shall not exceed 500m. In soft ground, the strainer length may have to be increased to provide the necessary stability. H-frames or straining frames may be used in place of straining posts were ground conditions prevent strainer posts being properly placed. These H-frames shall be constructed as per clause E.3.7 above.

Intermediate posts shall be, at least, 1800 mm long and a minimum of 100 mm diameter and shall be driven at least 500 mm into the ground. Intermediate posts shall be spaced at no more than 12 m intervals.

F.5.2 Barbed wire fence

Three strands of high tensile barbed wire, as per clause E.2.4, shall be used. Each strand of wire shall be strained tightly between straining posts. The top wire shall be 1.1 m above ground level and the bottom wire shall be between 300 and 400mm above ground level, with the central wire half way between the top and bottom wires.

Strainer posts shall be, at least, 2100 mm long and a minimum of 175 mm diameter and shall be driven at least 900 mm into the ground. Strainers shall be provided at the beginning and end of every length of fencing, at gaps or openings, at every change of direction where the angle is greater than 30º and to accommodate any significant change in gradient. Where long runs of fencing are to be erected, the maximum distance between strainer posts shall not exceed 100 m, except in cases where the run is straight and free of undulations, in which case the spacing of strainers shall not exceed 350m. In soft ground, the strainer length may have to be increased to provide the necessary stability. H-frames or straining frames may be used in place of straining posts were ground conditions prevent strainer posts being properly placed. These H-frames shall be constructed as per clause E.3.7 above.

Intermediate posts shall be, at least, 1800 mm long and a minimum of 100 mm diameter and shall be driven at least 500 mm into the ground. Intermediate posts shall be spaced at no more than 5 m intervals.

F.6 Free Range Poultry Fencing

The fence shall be at least 2.0 metres high and shall consist of wire mesh with a strand of electric wire above the mesh. There may be one or more strands of barbed or electrified wire between the mesh and top electric wire, with gaps between the wires not exceeding 100mm. The mesh shall extend to a height of, at least, 1200mm high. It is recommended that the first 300mm of mesh be turned out flat on the ground, to reduce the risk of predators entering under the fence. Poultry mesh shall be as per clause E.2.13, barbed wire shall be as per clause E.2.3 and electric wire shall be as per clause E.2.1. Electric fencers shall be as per clause E.3. The wire mesh and electrified wire shall be fully tensioned during construction.

Strainer posts shall be, at least, 2900 mm long and a minimum of 175 mm diameter and shall be driven at least 900 mm into the ground. Strainers shall be provided at the beginning and end of every length of fencing, at gaps or openings, at every change of direction where the angle is greater than 30º and to accommodate any significant change in gradient. Where long runs of fencing are to be erected, the maximum distance between strainer posts shall not exceed 100 m, except in cases where the run is straight and free of undulations, in which case the spacing of strainers shall not exceed 300m. In soft ground, the strainer length may have to be increased to provide the necessary stability.

Intermediate posts shall be, at least, 2450 mm long and a minimum of 100 mm diameter and shall be driven at least 450 mm into the ground. Intermediate posts shall be spaced at no more than 5m intervals.

F.7 Free Range Pig Fencing

The fence shall be at least 1.0 metres high and shall consist of wire mesh with a strand of electric wire at a height of 400mm above ground level on the paddock side of the fence and strand of either electric wire or barbed wire at the top of the fence. If pigs are to be kept on both sides of the fence, electrified wire shall be run at a height of 400mm on both sides. The lowest line of the mesh shall be no more than 25mm above ground level. Pig mesh shall be as per clause E 2.13

Strainer posts shall be, at least, 2100 mm long and a minimum of 175 mm diameter and shall be driven at least 900 mm into the ground. Strainers shall be provided at the beginning and end of every length of fencing, at gaps or openings, at every change of direction where the angle is greater than 30º and to accommodate any significant change in gradient. Where long runs of fencing are to be erected, the maximum distance between strainer posts shall not exceed 100 m, except in cases where the run is straight and free of undulations, in which case the spacing of strainers shall not exceed 350m. In soft ground, the strainer length may have to be increased to provide the necessary stability.

Intermediate posts shall be, at least, 1500 mm long and a minimum of 100 mm diameter and shall be driven at least 450 mm into the ground. Intermediate posts shall be spaced at no more than 5m intervals.

Appendix I: Date of clause revisions and additions

All changes from the previous version are highlighted in red.

Version: 26th August 2019

New Clause: F3.8

Clauses modified: E.1.2, E.1.4, E.1.5, E.2.1, E.2.2, E.2.3, F.3, F.3.8 renumbered to F.3.9, F.3.9 renumbered to F3.10, F.3.10 renumbered to F.3.11, F.4