



Unit Standard 19131

Demonstrate knowledge of fencing assemblies

Version 2

Level 3

Credit 3





Telford

Te Whare Wānaka o Puerua

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Introduction

When you have finished this module, you should be able to;

- Explain the function of
 - Diagonal assemblies
 - Horizontal breast plate assemblies
 - Angled end assemblies
- Identify and describe diagonal stay components
- Identify and describe horizontal end assembly components.

Why Erect an End Assembly?

The end assembly (commonly called a *strainer*) is the **foundation** for the whole fence. This means that the fence relies on the strength of the end assembly.

The basic principle of a fence is that wires are attached to the end assembly and *strained* to put **tension** in the fence and increase its strength. The end assembly must therefore be strong enough to maintain this tension without failing.

Before erecting an end assembly, it is important to carefully plan where the fence will go to ensure maximum effectiveness.

Readings

Fence Planning – Considerations

AgLink No. 816

Fencing Terms

Strainer Post

Large thick post, relies on the foots and stays for strength.

Stay

Braces the strainer.

Stayblock

Prevents the stay from moving through the soil.

Soil

Should be well compacted (rammed) around the strainer.

Fence Wires

Run alongside the stay.

90 Degree Angle

Between the stay and stayblock.

Mortice

Prevents the stay slipping off the strainer.

Foots

Help prevent the strainer being jacked out of the ground.

Footwires

Attach the foots to the strainer post.

Kick Block

A piece of timber located at the bottom of the strainer to counteract the pivot action of the end assembly at final loading.

Tie Back

A wire from the top of a post, to an anchor behind the post, to counteract the pulling force on the post.

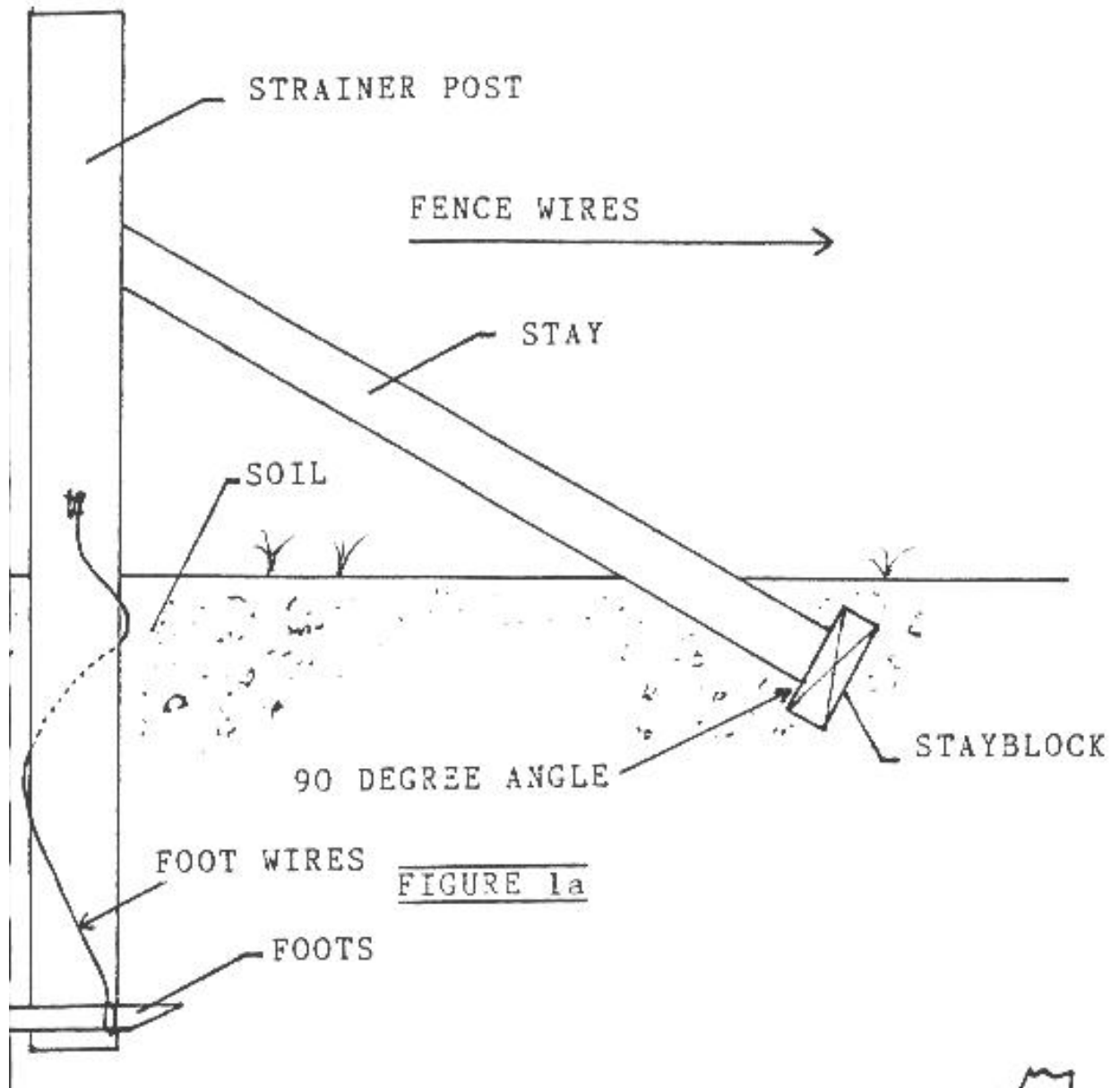
Deadman

Another name for an anchor in the ground to pull off.

Breast plate or block

A large piece of timber placed horizontally in the ground beside the strainer at right angles to the pull on the strainer post.

A Strainer (End) Assembly



Types of End Assembly

The three main types of end (strainer) assembly are;

- Diagonal
- Horizontal
- Angled end with Breast Plate

Readings

Strainer Assemblies

Lincoln University Farm Technical Manual, Lincoln University, 2003

Fencing – Strainer Assemblies – General

AgLink No. 818

Fencing – Posts, Battens and Prefabricated Fencing

AgFact No. 193

Fencing – Strainer Assemblies

AgFact No. 195

Fencing – Strainer Details

AgFact No. 196

Fencing – Strainers – Conventional Type

AgLink No. 819

Fencing – Strainers – Horizontal-Stay Type

AgLink No. 820

Fencing – Angle and Dip Structures

Erecting a Conventional Strainer Assembly

Choose the site.

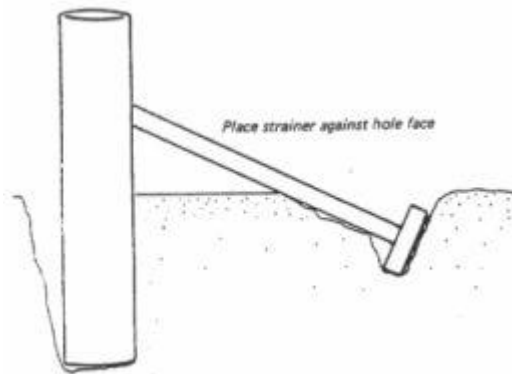
- If possible the stay block should not be placed uphill from the ground surface at the strainer
- When placed, the stay block should be approximately 10 cm below the ground level (subject to ground conditions).
- If possible, site should be in firm material away from swampy areas.

Dig the hole;

- At an angle where the strainer is at right angles to the slope; or
- If the strainer is an angle post, then it should be placed so that it is in line with the posts leading off in the two directions from it.

Avoid making the hole excessively large. Extra digging costs energy and time. Check the depth before putting the strainer in the hole, due to the heaviness of having to lift the strainer out again if the hole is not correct!

Place the strainer against the hole face from which the stay will lie.



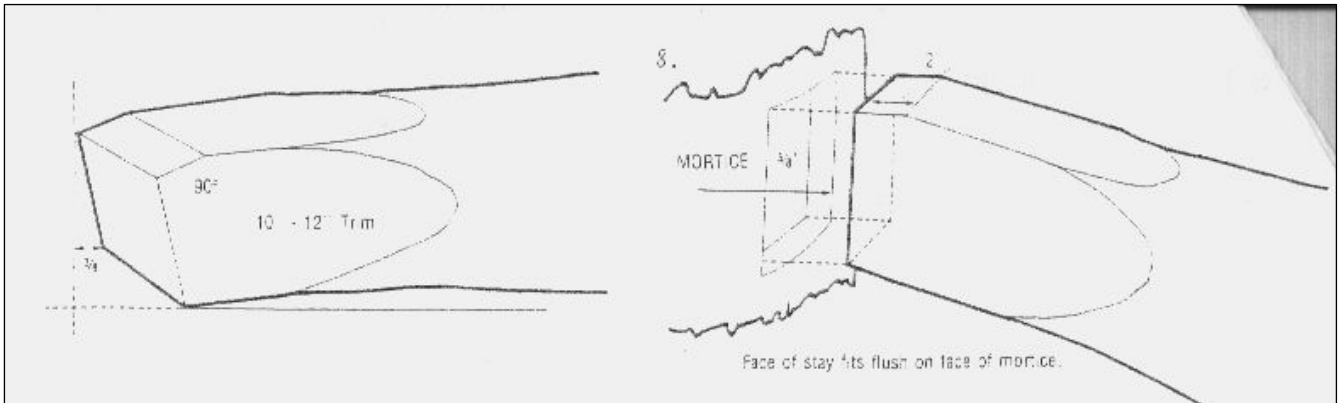
Ram soil at strainer base. Place 7-10 cm of soil in hole and ram.

Place foots;

- Construct two foots. The foot should be about 12cm longer than the thickness of the strainer. Increase or decrease foot length according to soil condition. In soft areas, increase foot length.
- Place each foot in line with the fence line on each side of the strainer but the foot wire from each foot should be stapled on the other side of the strainer to where the foot is placed. This prevents twisting of the strainer when the wires are strained.

Fill in the hole using four fillings and four rammings. Mark the strainer where fence wires will be placed.

Choose a strong, sound stay as free as possible from knots. The stay should be at least 2.5m long. One end of the stay should be trimmed approximately square so that it can fit into the mortice of the strainer. Avoid trimming the stay to a point because then it will penetrate the strainer. Bevel the trimmed end of the stay so that it can fit into a mortice in the strainer.



Make mortice in strainer. Place bevelled and trimmed end of stay against strainer. Place about halfway up and between gauged wire marks and in the direction of the proposed fence line. Check the direction of the stay by temporarily fixing it in position and sighting it from behind the strainer to a peg along the proposed line.

Scribe around top and sides of stay and allow 2cm gap below stay. Chisel out this piece to a depth of 2cm. Avoid making too deep a mortice.

Place stay block. Choose a block with an area suitable for ground conditions. The softer the ground, the larger the stay block. Block size at least 20 cm by 10 cm by 1 metre long. Mark stay block trench. When fitted, the stay block is placed in back of trench and half its thickness behind the end of the stay so that the stay can be fitted firmly against the stay block.

Dig trench so that stay block is just below topsoil in subsoil. Stay block must be at right angles to fenceline and stay.

Fit stay by digging trench from stay block so that stay can be fitted from the strainer to the stay block. Use a spade as a slide so that stay can be rammed onto stay block. Tap top and bottom of stay so that it fits firmly into the strainer and stay block.

The influence of soil on end assemblies

Soil type

Soil type will have some bearing on what strainer assemblies you can use, as well as whether the post are going to be driven with a post driver or dug in by hand.

Post can be driven into all soil types, sand, silt, clay, peat, rock and gravel with the aid of modern post drivers, augers and rock spikes. The only difference will be the size of the post.

Generally in softer soils, sand, silt, peat and some wetter clay soils, horizontal stay assemblies work best. In gravel soils, it is hard to get a conventional stay tight by ramming, so horizontal stays are normally used. If however the post are being dug in by hand, it may be easier to use conventional stays but you will need to use a larger stay block than normal in softer soils.

In harder clay soils and rock, conventional stays and horizontal stays both work well and the choice normally comes down to individual preference.

Tie back

The function of a tie back is to supply weight in the opposite direction to the pull on the strainer post. A tie back normally consists of some form of anchor, (a post driven right down into the ground or a post dug horizontally into the ground – called a 'deadman') and 2 or 3 loops of wire to connect the strainer post and the anchor together.

The wire is attached to the top of the strainer post and the centre of the anchor or deadman and lightly tensioned. The anchor should be placed at 180 degree to the pull of the fence for maximum affect.

Breast plate Assemblies

Breast plate end assemblies are ideal for 4-5 wire permanent electric fences or corner post on conventional fences where there is only a slight corner.

A breast plate is a large piece of timber or ½ round post 1-2m long placed just under the ground against the strainer at 90 degrees to the pull of the fence. In order for the strainer to move 'pull' it must push the breast plate through the ground.

Structure Failures

Diagonal Stay

The strainer post has lifted

- It may not have been footed correctly
- The stay may be too short
- The stay diameter may be too small
- Strainer post may be too small in either length or diameter

The stay block is bent or pushed through the ground

- The stay block may be on the wrong angle
- The stay block may not be deep enough

The strainer post is rotating

- The strainer may not be rammed properly
- Foot wires incorrectly positioned

The stay is buckled

- The quality of the materials may be inferior (e.g. there are knots or cracks)
- The tension of the wire may be too tight

Horizontal End Assembly

The strainer post moved, with a resulting gap behind

- The wire may be tied the wrong way
- The strainer post may be too small, in either length or diameter

The diagonal tie wire is stretched

- The wrong type of wire may have been used e.g. mild steel
- There may not have been enough wraps of wire around posts

The compression bar is buckled

- The compression bar (stay) may be too long
- The diameter of the stay may be too small
- The stay may not be morticed in correctly.

Tie Back

Too much force has been applied to the strainer

The fence has been over strained.

The anchor may have pulled out

The anchor too small

The brace wire has broken or stretched

The wrong type of wire has been used

Strainer has sunk

The fence has been over strained

The anchor is too close to the strainer

Breast Plate

Breast plate is bent or broken

The breast plate was not thick enough

The breast plate was not put in correctly

The fence has been over strained

The breast plate has pushed through the ground

The breast plate was too small

The breast plate was not put in correctly

Strainer has rotated

The breast plate was on the wrong angle

The strainer was not put in correctly