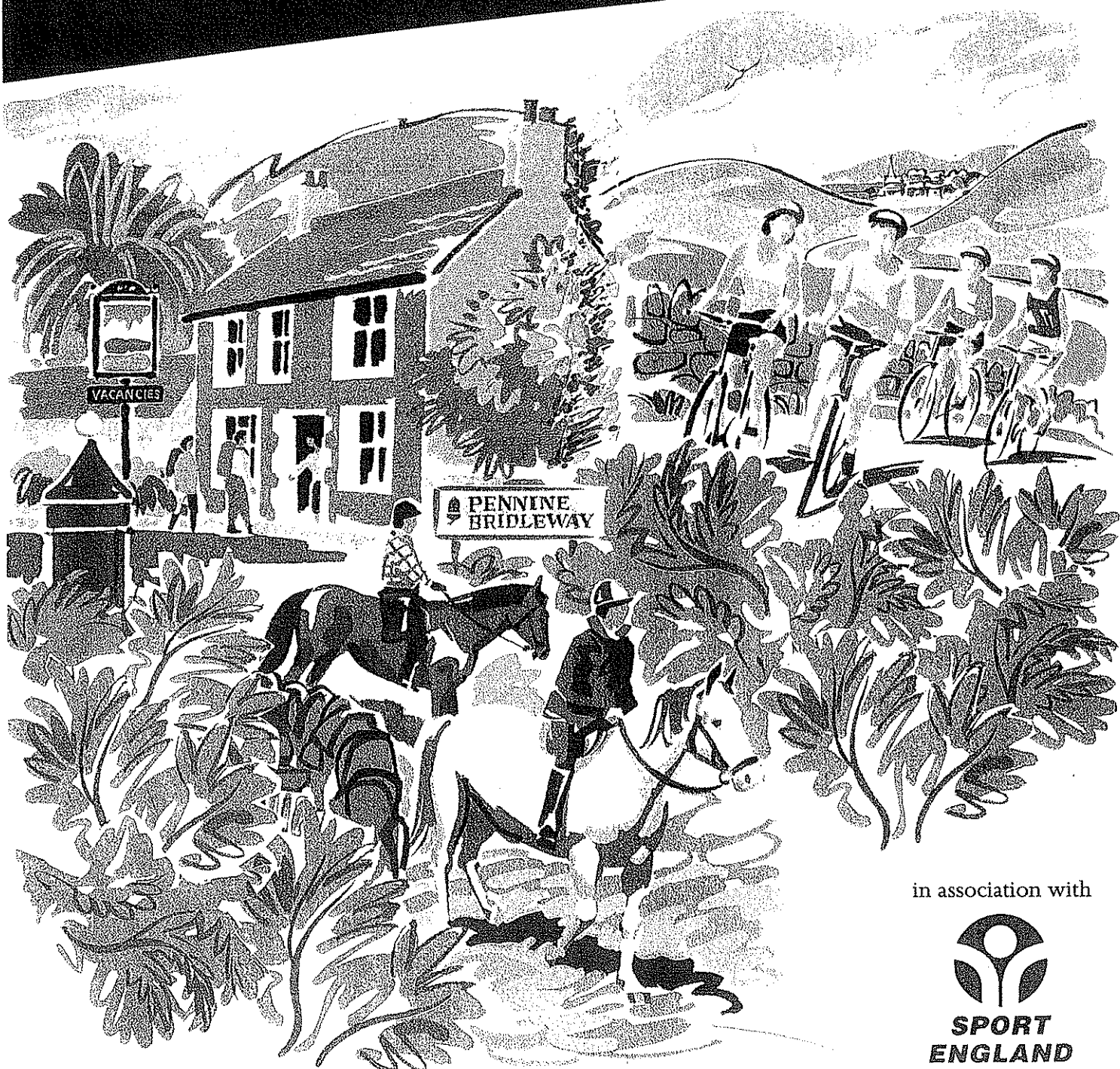


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PENNINE
Bridleway
National Trail

Design guide



in association with



PENNINE BRIDLEWAY NATIONAL TRAIL

DESIGN GUIDE

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INTRODUCTION

1 PREFACE

In January 1995 the Secretary of State for the Environment approved the route for the Pennine Bridleway National Trail between the Fat Lamb Inn near Kirkby Stephen in Cumbria and Carsington Reservoir in Derbyshire, a route of approximately 208 miles (335 km).

The challenge is now to create a long distance bridleway which will be accessible and safe for use by horse riders, walkers and mountain bikers (as opposed to cyclists on road or touring cycles). Where possible reasonable steps will be taken to ensure that the route is accessible to all provided that in so doing the suitability of the route for horses is not compromised.

The designation of a route as a National Trail should be a form of quality assurance to potential users and sponsors.

2 ROLE OF THE GUIDE

This guide has been produced principally for use by those managing authorities responsible for implementing and maintaining the Pennine Bridleway National Trail. Its aim is to ensure a consistent high quality of design, construction and maintenance in line with the standards for National Trails as set out in "Meeting the Grade - Quality Standards for National Trails" CCP 514 (1997).

The guide will bring together current best practice with regard to design and construction techniques relevant to bridleways in the Pennines. It is envisaged that the guide will be updated as new techniques are tried and tested or existing techniques adapted and improved and as new stages in the development of the Trail are reached.

Whilst the guide sets out standards and provides standard specifications for many operations likely in the construction of the route, it is expected and understood that each section of the route will need to be assessed according to the location and characteristics of the section in question and in some cases it will not be possible to stick rigidly to the guidance given. However it is hoped that this document will go a long way to cutting out any confusion over what is required and will also allow the information to be shared and so avoid reinventing the wheel.

The guide is divided into 4 chapters:

Chapter 1 - Guiding Principles for Route Construction - to be applied to the whole of the route, a general guide to aid decision making regarding the works to be undertaken.

Chapter 2 - Standards - setting out the minimum standards for the route, surface, furniture and facilities to ensure the required quality is attained.

Chapter 3 - Design Information Sheets - providing drawings of suitable furniture and features which can be copied if required when putting together contract specifications. Notes

are also included to provide a checklist for contractors and supervisors to ensure small but important details which provide the polish to the Trail are not overlooked.

Chapter 4 - Maintenance - It is the intention that this chapter will be superseded by a more comprehensive maintenance guide towards the end of 1999. The information provided at present relates to a proposed programme of survey and inspections and the type of information required for the maintenance records.

3 ACKNOWLEDGEMENTS

I would like to take this opportunity to thank representatives of the local authority partners for their active participation at the meeting of the design guide working group.

I would also like to thank Susan Rogers who, some years ago, collected a great deal of information which in many instances formed the basis of the material presented within this guide.

My special thanks go to Graeme Leathard of Lancashire County Council whose questions regarding the design of the route prompted the format of the information supplied and who has since spent a lot of time himself turning the specifications and requirements outlined into usable designs.

Chapter 1 GUIDING PRINCIPLES for ROUTE CONSTRUCTION

The aim of this section is to provide a general guide to aid decision making regarding the level of intervention and the type of works required in order to create a route which fulfils the expectations of the users.

1.1 LOCAL DISTINCTIVENESS

The intention is not to provide a route of a universal type but to ensure that the quality standards are met using local materials and techniques as applicable. Local character and distinctiveness is important and should be maintained. The only area where a universal look is expected is with the signage and waymarking of the route.

1.2 SURFACE

1.2.1 Levels of Intervention

- There is a presumption in favour of minimising hard surfacing unless the existing natural surface is not sustainable.
- There is a presumption in favour of retaining a vegetated surface on a stone track provided that increased use will not cause users to seek an alternative line i.e. where a stone track has become vegetated the preference should be to leave it as such provided it is adequately drained and its condition is not such that those on foot or bike feel the need to seek an alternative line.
- Where a surface is being improved consideration should be given to finishing the improvement work before any junction with a road to avoid encouraging illegal vehicular access.

1.2.2 Experimental Sections

In order to avoid unnecessary intervention and to try to retain as much of a natural surface as possible, the Countryside Agency will recognise the existence of experimental sections. In such cases, likely to be on newly created stretches of bridleway crossing well drained land, a minimalist approach would be recommended in the initial implementation.

If after an agreed length of time and regular inspections the route is standing up to the use it is receiving then the experimental term will be over and future work would be funded by the Countryside Agency at the maintenance rate of up to 75%. If following inspection it is clear that further intervention is required, then the Countryside Agency will still fund the necessary works at 100%.

Another case where sections of the route could temporarily be labelled as experimental are those where new techniques are being tried.

In both cases the sections must be agreed with the Countryside Agency prior to assuming that further work would be funded at 100%.

1.2.3 Improvements to Sections Carrying Vehicular Rights

- There is a presumption against funding improvements to sections of the route carrying vehicular rights other than to ensure the standard is suitable for bridleway users.
- Where works are to be undertaken on routes carrying a public or private vehicular right the aim should be to minimise the amount of hard surface by encouraging the creation of a grass or less jarring centre strip whilst retaining reinforced wheel tracks.
- Consideration should be given to minimising the improvement to the first 20m of a byway, RUPP or UCR from its junction with a classified road, in order to avoid encouraging unsuitable vehicular access.

1.3 FURNITURE

1.3.1 Gates and Barriers

- Where the opportunity arises there is a presumption in favour of reducing the number of gates and horse stiles along the Trail.
- As the route will be gated there is a presumption towards removing stiles which have become obsolete and making good the boundary.

1.3.2 Fencing

- Consideration can be given to fencing the route from the rest of the field where the Trail passes along the edge of a field occupied by horses.
- Consideration will be given to funding new stretches of fencing along the top edges of existing sunken lane bridleways to avoid the detrimental effect caused by cattle or sheep scrambling up and down the sides of the lane. Future maintenance of such is still likely to be the responsibility of the landowner.

1.4 MANAGEMENT FOR CONSERVATION OBJECTIVES

- In areas where there is a statutory designation for heritage or conservation value relevant consents and advice must be sought from the appropriate statutory agency.
- Advice and consents must be sought from the Environment Agency for improvements to any water crossings.
- Other interested bodies such as local wildlife trusts should also be consulted where appropriate.

- On sites of ecological interest works should be timed to avoid unacceptable disturbance to fauna and flora.
- Design of works should not modify habitats off the managed route, e.g. alter lines of drainage or water tables.

1.5 ROUTES FOR HORSES - HORSE FACTS

As not everyone is familiar with horses the following information may provide useful background:

- Horses have greater difficulty coping with a gradient when going downhill than when climbing uphill.
- Horses and riders have a fear of crossing soft, poorly drained ground where there is the possibility that they might sink.
- Horses are naturally curious and will often want to check out strangers crossing their paddock. A fence to separate the Trail from the horse occupants of a field may be a good idea.
- It is often the small details such as the positioning of a catch or forethought in the siting of a gate that will help make the Trail an enjoyable experience to someone using it on horseback or for the less able. To open a gate when mounted a rider will preferably stand the horse parallel to the gate with the horses head towards the catch and its tail towards the hinges. The rider should then be positioned beside the catch. The key is to ensure that there is room beyond the shutting post for the horses head to extend whilst remaining parallel to the gate (i.e. this position can't be attained if the gate is sited in a corner!).
- If riders are to be able to close and latch a gate there must be room to turn the horse either side of the gate (minimum turning space required is 2.9 metres).
- Riders (and walkers) favour a natural or grassed track as they do not jar the legs.
- Horses cannot be expected to stand patiently for long in order to cross a road so room to fidget, i.e. an adequate waiting area, is important.
- A rider has more control of a horse when mounted than when leading the horse from the ground.
- Drops, for example from bridges or paths following ledges, will look more daunting when viewed from a horse. Provision of parapets (on bridges) or safety rails will help to boost the riders confidence.

- Most riders would rather use a ford than a bridge (although some horses have a problem going through water)

1.6 ACCESS FOR PEOPLE WITH DISABILITIES

The Pennine Bridleway passes through a mixture of countryside ranging from rural and working landscapes to open country and semi-wild land. Because of the type of terrain being covered and the desire to minimise the physical impact of the route in terms of the type of works to be undertaken, the surfaces to be provided and the hope to encourage revegetation where possible, it is not likely that the Bridleway will be able to accommodate all users along the whole route. However it is anticipated that there will be areas where improvements could be made to facilitate access, for instance in the vicinity of some of the staging posts and the southern terminus.

Where possible we will seek to do the following:

- provision will be identified for disabled parking at suitable staging posts along with toilets, seating and picnic benches which will accommodate wheelchairs
- ramps will be provided to enable disabled riders to mount
- paths leading from the staging posts will be formed with a camber in preference to a cross fall
- gates on wheelchair accessible paths will be provide with catches that can easily be reached from a chair as well as from horseback
- information boards and signs will be carefully positioned to be readable by all
- leaflets and information provided will take into account factors such as print size, font, contrast and layout

Chapter 2 STANDARDS

The aim of this section is to set out the minimum standards for the route to ensure that the required quality is attained.

2.1 SUMMARY SHEET - STANDARDS AND DIMENSIONS

Route		
Height	clearance of overgrowth for ridden horse	min. 2.8 metres
Gradient	gradient above which sweeping "S" required	8 degrees (1 in 7)
Surface		
Preference	free draining vegetated track	most desirable
	unvegetated well drained natural surface	
	existing vegetated well drained stone surface	
	hymac path	
	grassed gravel	
	aggregate path	
	stone causey	
	stone pitched path	least desirable of accepted surfaces
Seed mix	Rigby Taylor (not named)	35g/m ²
Fertiliser	Rigby Taylor Planting Plus	<i>insert rate</i>
Soil additive	Alginure (composted seaweed)	70g/m ²
Profile	cross fall	1 in 40 (40mm)
	camber - used in preference to cross fall on paths with wheelchair access	1 in 25 (25mm)
Materials	geotextile	buried at least 225mm
	natural materials	blend sympathetically in colour & texture, ideally obtained locally
Widths	usable width	2 to 3 metres
	width for agreement	4 metres
	turning circle	2.9 metres minimum
Steps	height of step & depth of tread	250mm max. height, 2m min. tread
Drainage		
Water breaks	angle of slope beyond which water breaks will need to be provided	5 degrees (1 in 11)
	preferred water breaks	shallow "v" or pitched hump
	angle of water breaks	min. angle of 30 to a max. of 45 degrees with an across path slope of >5 and < 15 degrees
Ditches	sides angled so that ideally the surface width is twice the width of the base	min. depth 300mm, min. width at surface 300mm

Furniture		
Materials	timber	treated softwood or hardwood from a sustainable, renewable resource
Gates	between gateposts (bridlegate)	1.5 metres minimum
	between gateposts (fieldgate on byway)	3 metres
Horse stile	width between posts, height of step	1.7m min.width, step height 375mm maximum(recommend 300mm)
River Crossings		
Ford	approaches firm, stable and non-slip with gentle slope (not more than 1 in 10), base reasonably level & firm	max. depth no greater than 0.5m under normal conditions:depth pole to be provided where ford wider than 4 metres
Irish ford	suitable where river/stream banks steep but not enough to warrant a bridge	
Sleeper bridge	suitable where span <3m	1.5m min.width (prefer 2m) with kicking board (parapet required where drop >1m)
Bridleway bridge	width at least 2m where span upto 8m. If river wider or crossing of byway status, width should be at least 4m	parapets min. 1.5m high where drop to river >1m, kicking board at least 250mm, gaps between deck boards no greater than 10mm (if necessary provide gap <= 50mm below kicking board for additional drainage)
Footbridge	If on the bridleway, must be accessible to mountain bikes	no steps at ends, wide enough to accommodate bike with panniers
Road/Rail crossings		
Underpasses	preferable to bridges for crossing busy roads	height 3.4 - 3.7m, recommended width 3m
Bridges	over main road	parapet 1.8 metres, infill at bottom 600mm & mesh for the remainder
Holding area	safe waiting area for at grade crossings	4m min. width, recommend 5m deep (should be able to stand 3m back from road side)

2.2 THE ROUTE

With the knowledge we now have regarding the consequences of high levels of use on more fragile landscapes, every effort has been made to avoid taking the Trail through areas of deep peat or over steep gradients where the likelihood of damage through erosion is going to be high. Safety has also been a key issue and the search for safe road crossings or crossings which could be redesigned to make them safe, has often helped to determine the line the route has finally taken.

Once on the route the user should expect to find:

- a continuous linear route
- a route on legally defined public rights of way
- a readily passable and unobstructed route (including freedom from undergrowth and overgrowth)
- a route which, as far as possible, is aligned to provide the user with the best views of the surrounding scenery and access to notable viewpoints and places of interest
- a clear safe route to follow across open ground so users, particularly those on horseback, can be confident that they will not sink
- no sections on busy or dangerous roads
- a sweeping "S" or zig zag path where the gradient is more than 8 degrees (*1 in 7*)
- that where works have been undertaken the site is left tidy e.g. the area from which any materials have been "borrowed" is restored and landscaped, any turves dug up have been re-used, etc.

2.3 SURFACE

The critical factor in the successful creation of this National Trail will be the choice of surface to suit the local conditions. The initial capital cost is also important but the success of the path will in future be judged on how it stands up to use and the experience that is provided such that a higher capital cost in the beginning is justified.

2.3.1 Surface Type

The user should expect to find:

- a green sward path - or, where this is not naturally sustainable;
- a path provided by the protection and reinforcement of the existing vegetation - or where this is not sustainable;
- a path on unvegetated natural surfaces - or, where this is not sustainable;
- a path on revegetated artificial surfaces (even if only to the edges of the path)
- that at no point is the ground soft enough to allow a horse or cycle to sink deeply into it
- that at no point does the vegetation cover possible hazards such as rabbit holes
- verges are managed, where roads are used as part of the route, so there is an adequate refuge for a walker or rider encountering traffic
- that stone pitching is avoided other than for short sections where such a treatment may be warranted e.g. the entry and exit to a ford crossing, or the landing of a gateway

- that construction of new causey (or flag) paths is avoided other than for short sections e.g. to cross small patches of soft ground. If used a path user should be able to see that the section in question is clear before setting foot on the flags i.e. to avoid having to pass another user and risk stepping onto soft ground.
- no long straight edges on newly created stretches of path
- camber provided in preference to a crossfall where path accessible to wheelchairs

2.3.1.1 Hymac Paths

This technique is recommended as it is relatively inexpensive and to a large extent, particularly where the substrate is good, it cuts down on the need to import materials to a site. The mechanics of the procedure are explained in chapter 3, suffice to say that the success of the method depends on the skill of the contractor. It is an area where a case can be made for employing a specialist contractor with experience in this technique. A sensitivity for the surroundings in order to fit the path into the landscape, and an eye for a good line to make best use of the materials present, are as important as the ability to operate the machine.

The content of the substrate often changes along the course of the section to be hymacked. In places where the stone content is low it may be necessary to top dress the path with stone. In other patches, the stone content may be too high with large rocks being brought to the surface. In these situations the larger stones will need to be removed and a dressing of smaller stone to dust (or soil) applied.

In order to produce a green path and to help stabilise the formation, the newly formed track should be seeded and fertilised before the path has had a chance to dry out (once the surface has become firm the seed is too easily washed or blown away). Further dressings of seed and/or fertiliser may be necessary.

As with any new construction it is recognised that minor works may be required in the early stages to “touch up” the new construction. Paths created using this technique are offered a better chance of success if allowed to dry out and settle before being used by the public.

2.3.1.2 Seed, Fertiliser and other Soil Additives

Whilst hymacking is a method that we are keen to use on the Pennine Bridleway, the path produced can look “raw” and will benefit both visually and structurally if the growth of vegetation at the sides of the path at least, can be promoted. Whilst machine built paths are becoming more common, the success of vegetating them has to date not been widely documented and monitoring appears to have been sporadic. The Pennine Way project is therefore currently employing an officer looking into the revegetation of these paths. As the trials are in their early days this is an area where information is likely to be updated as results of the trials are gathered.

Seed Mixes

In an ideal situation each path would have its own site vegetation strategy which would take account of factors such as:

soil type and fertility
type and management of use
land forms, drainage and other site factors.

The seed mix would be matched to site conditions e.g. trample resistant species where use is heavy, and local provenance's of seed used where nature conservation is important.

A Rigby Taylor seed mix has been sown for the purposes of the Pennine Way trials. This has already been used on a number of hwyac paths in Northern England and has been approved by English Nature for use on the Hadrian's Wall SSSI and on another SSSI in the Lake District National Park. It is hoped to get acceptance of this mixture from English Nature as a standard mix for use in SSSI's. The composition of the mix was put together by the Institute of Terrestrial Ecology. It is designed to act as a nurse crop, eventually allowing native species to colonise. The composition of the mix is as follows:

40% Dancer Perennial Rye Grass
20% Eureka Hard/Sheeps Fescue
19.5% Tamara Chewings Fescue
10% Quatro Sheeps Fescue
7.5% Highland Browntop Bent
1.5% Emerald Creeping Bent
1.5% Tufted Hair Grass.

The normal rate of application is 35g/m².

Application

In the Lake District National Park the seed and fertiliser has been mixed and broadcast by hand, more or less in the wake of the hwyac machine i.e. whilst the surface is still sticky. In this way it is hoped that the seed will "stick" to the surface and not be blown or washed away. This process would also be assisted by lightly compacting the path surface once the seed has been broadcast.

Fertiliser

The most commonly used fertiliser has been found to be Rigby Taylor Planting Plus which has a composition of 5:18:10 N:P:K. This mix is known to be good for stimulating root development whilst not producing too much top growth. The Pennine Way trials will also use this mix to allow some comparison to be made between experimental plots and other sites that have previously been treated with the same fertiliser. The normal rate of application is again 35g/m².

Other Soil Additives

The Pennine Way trials are also experimenting with the addition of alginure (composted seaweed) to the path surface. This flocculates the clay content of the soil, adds organic matter, lifts the pH slightly and increases water retaining properties. Early indications point towards there being a beneficial effect in encouraging vegetation to establish.

The rate of application is 70g/m².

2.3.1.3 Grassed Gravel Path (Gazon-gavier)

The aim of this technique is to improve the prospects of vegetating an aggregate path, either for the full path width for bridleways with no vehicular access or for the centre strip of stone tracks which have legitimate vehicular use.

Up to 25% topsoil is incorporated into the top 150mm of aggregate which overlies a free draining sub-base. A seed mix containing wear resistant species is then sown and fertiliser incorporated.

Although this technique was outlined in "Managing the impacts of recreation on vegetation and soils: A review of Techniques" by Neil Bayfield and Bob Aitken, it has not been possible to find examples of it in use. Lancashire County Council will be experimenting with variations on this technique. The path will be formed from 200mm of 6F1 with 15mm of topsoil incorporated into the top 100mm. In experiment 1 the topsoil will be rotavated into the top 100mm, the surface seeded and then lightly rolled. In experiment 2 the topsoil will be combed into the top 100mm with the teeth of the machine bucket, the surface seeded and then rolled. The results of these trials will be incorporated into future updates of the guide.

2.3.1.4 Aggregate paths

Where possible we hope to limit the amount of new aggregate path that will be required in connection with the development of the Bridleway. Short sections may be required where use is likely to be heavy, for example where a path may need to be created along a roadside verge.

It is accepted that stone may need to be added to repair damage and to raise the level of existing stone tracks where erosion has occurred but this would always go hand in hand with the review and subsequent repair/improvement of the drainage system.

2.3.1.5 Geotextiles

Geotextiles are basically flexible porous sheet engineering materials whose main functions are:

- 1 Reinforcement - to improve the bearing strength e.g. geogrid
- 2 Separation (filtration) - to prevent mixing of fine or coarse materials (e.g. when used as part of an aggregate path construction to prevent the freely drained surface becoming clogged with fines from the subsoil) e.g. Terram

- 3 Erosion control - to prevent soil surface particles from washing or blowing away and to trap sediment e.g. geocell

Suggested considerations when using geotextile/geogrid:

- Geotextiles and geogrids should only be used where layer separation is essential or where the substrate load bearing capacity means a path will not be adequately supported without them e.g. on bare amorphous peat.
- Geotextiles or grids should not normally be used on any mineral substrate. On clay and similar substrates stone should be consolidated into the surface
- Geofabrics and geogrids must not become exposed at path edges. They should be dug in at the sides of the path and covered to at least 225mm with aggregate or with turves and boulders to prevent them showing at or rising to the surface
- Geofabrics should not be used on slopes where the smooth surface is likely to encourage the aggregate to slide off
- To give a path where geotextiles have been used the best chance of revegetating, the geotextile should not be extended beyond the edges of the path

2.3.1.6 Stone Causey (or flag or slab) paths

Although many of the packhorse routes in the South Pennines feature these paths, formed by embedding large flat stones into the hillside, observation of the patterns of use will show that where the ground is firm enough to take it, horse riders will out of preference avoid the slabs. This, added to the inherent narrowness and the inability to “green” such a path means that it is not anticipated that many new sections of causey path will be created on the Bridleway.

As a path for horses, the new style flag path as used for example on the Pennine Way, is suitable only for short sections because of the difficulty of turning round or passing others travelling in the opposite direction.

The flags used are either recycled slabs from the floors of old mills or those that have been freshly quarried. As the latter are less regular in shape and size, a more natural looking path is likely to result. Typical flags used are 85-110mm thick, about 75-110cm wide and 60-130cm long (Ref. Repairing Upland Path Erosion). The Cleveland Way National Trail typically specifies slabs that on average are 1m square with an average thickness of 125mm.

Anticipated use of this technique in connection with the Pennine Bridleway will be for short sections only over soft ground.

2.3.1.7 Stone Pitched Paths

Stone pitching produces a long lasting surface but not one that is particularly suitable for use by horses or bikes. Whilst being relatively low maintenance once in place, it is slow, labour intensive and expensive. This is another technique for which a high level of skill is required in the chosen contractor. Use of stone pitching on the Bridleway will therefore be limited. Its use will be particularly appropriate however for providing a path into and out of those

fords where a resilient path is needed to stand changes in the level of the water course along with the action of the horses hooves.

2.3.2 Surfacing - Tips for Good Practice

- where artificial surfaces are unavoidable, natural materials are chosen which blend sympathetically in colour and texture with their setting, having ideally been obtained locally
- stone pitching should use random and not dressed stone of a type that will not become polished and slippery through wear
- all dressed stone constructions where dry construction is not possible, should have recessed mortaring
- where geotextiles are used they are not visible and will not be easily exposed. The geotextile will need to be deeply buried (*225mm minimum*) to prevent the action of the horse pulling it to the surface
- newly constructed or re-graded paths will incorporate a cross-fall (*recommend 1 in 40*) or camber (*recommend 1 in 25*) to ensure surface water is shed
- where the path is likely to be accessible to wheelchairs, a camber should be incorporated instead of a crossfall
- where surface works are required any turves removed are salvaged and reused

2.3.3 Surfacing - What to Avoid

- large loose stones on the path surface
- road planings, brick, concrete, or tarmac - used on the surface of the path
- use of aggregate which "sets" and which will become polished and slippery with use (some limestone)
- the use of cement or concrete is not acceptable in path works, even as dry mix mortar for pitching or setts

2.3.4 Width

- the aim will be to provide a usable width of at least 2 - 3 metres where possible.
- in open country any new track should be no wider than 2 metres to reduce the visual impact; the width should be varied to avoid any long straight edges
- where new Public Bridleway sections are being agreed, it is suggested that the width be specified as at least 4 metres (to allow room for manoeuvre during works) although the width of path created can be less than this. NB this specification relates to the acquisition of a new BW stretch rather than the constructed width.
- on open ground the agreed definitive width for new sections should be as wide as possible to allow for flexibility in alignment without need for diversions (Hadrian's Wall NT will specify 30m).
- on bridleway sections where the Trail width is limited and the whole of the restricted section is not visible, passing places should be provided.

- on byways or bridleways with private vehicular rights, passing places should be provided where the full length of the restricted track can't be seen from a refuge when on horseback

2.3.5 Drainage

- drainage should be suitable to cope with storm conditions
- drainage from the route should connect into a larger network or carry the water well away from the path
- design of works should not modify habitats off the managed route e.g. alter either lines of drainage or the water table
- water breaks should be provided where the slope is greater than 5 degrees (*1 in 11*)
- design of the water breaks should not disadvantage any class of bridleway user, open cross drains or water breaks with vertical sills protruding above the level of the path are inappropriate (*recommend use of a shallow "V" or humped water break*)
- water breaks should be angled correctly across the path (*recommend min. angle of 30 to a max. of 45 degrees, with across path slope of >5 and <15 degrees*)
- open ditches should not be used to try and improve existing narrow paths (*recommend use of French drain*)
- in sunken bridleways a French drain may be used to provide drainage whilst retaining the paths width however it must be covered in a suitable aggregate and preferably placed at the edge of the path (*recommend the drain is at least 750mm deep*)
- where plastic pipes are used for cross drains the pipe should extend beyond the edge of the path and the ends be concealed with stone headwalls or turves (*recommend pipe extends 1m beyond path edge and any mortar used in the headwalls is recessed*)

2.3.6 Steps

- steps should be used as a last resort where it has not been possible to reduce the gradient through zig-zagging the path
- gently sloping the tread of the steps will allow for a reduction in the riser height to a maximum of 250mm.
- the tread should be a minimum of 2m deep but will be easier for a horse to negotiate if deeper than this
- good design and careful placement of the steps is essential other wise they are likely to be bypassed

2.4 FURNITURE

The user should expect to find:

- consistent high quality design, style and use of material to suit the character of the local landscape;
- furniture that is well maintained, safe, comfortable and easy and convenient to use

2.4.1 Gates

It is our aim to ensure that the gates provided are sited, installed and maintained to a standard where neither users nor landowners are inconvenienced, the users by gates which are difficult to open nor the landowners by gates which the users find difficult to close.

The user should expect to find:

- gates can be opened and closed without the need for lifting, the catches can be operated with one hand, can be reached from the saddle and are equally easy to open and close from either side of the gate
- gates will preferably be self-closing however this should not be achieved through the fitting of springs or weights which can cause the gate to close too rapidly and distress the horse. Ideally the hinges should be off-set with an adjustable bottom fitting and a top strap band with a corner eye (which has been found to ensure better closing)
- bridle gates (*minimum width between inside of gate posts being 1.5m*) should be provided in preference to field gates on bridleways and should be considered for placing beside field gates on byways
- field gates on byways should have a *minimum width between inside of gate posts of 3m*
- timber gates should be used in preference to metal gates (unless in the case of a field gate the landowner prefers metal)
- timber for all items of furniture should be treated softwood or hardwood from a sustainable, renewable source.
- gates should only be sited on level ground e.g. if there is a change in level between one field and the next then a level platform will have to be created
- gates provided to bypass cattle grids are sited such that the horse will not face the grid whilst the catch is being operated. Some horses cannot be persuaded to stand facing the grid (i.e. if the catch is beside the grid) as they are aware of the potential danger of stepping onto it. The catch should therefore be furthest from the grid and the hinge nearest to it. A fence should be provided beside the grid to ensure that if startled the horse will not accidentally step onto the grid - it is also important to remember that a *minimum turning area of 2.9m* will be needed to allow the rider to turn the horse to shut the gate.
- any gate leading onto a road is set far enough back to allow the horse to be clear of the road before having to tackle the gate (*recommend 5 metres*)
- there should be no barbed wire in the area of the gate i.e. for a distance of *at least 2 metres* either side of the gate (barbs can be removed or covered)
- any electric fencing in the vicinity of the gate should be insulated to ensure that the Trail users will not accidentally brush against it
- the catch recommended for use on the Pennine Bridleway is the Safety Gate Hook and Eye (as supplied by Eliza Tinsley, Reddale Road, Cradley Heath, West Midlands, B64 5JF, Tel 01384 566066 or equivalent approved). However where the gate is situated on a section of the route likely to be used by wheel chairs the recommended catch is the Easy Latch (as supplied by Centrewire, P.O. Box 11, Wymondham, Norfolk, NR18 0XD Tel. 01491 614490 or equivalent approved) by most Trail users and at a lower level by those in wheel chairs

- the gate catch is placed on the top bar so it can be reached without a rider having to dismount but so it is visible from whichever side the gate is approached to avoid causing an inconvenience to walkers and cyclists
- if a landowner is concerned about the catch being placed on the top of the gate possibly allowing sheep to push the gate open at the bottom, consideration should be given to the use of an easy latch gate catch which fastens half way down the gate but which can also be opened from the top of the gate.
- gate fittings should be heavily galvanised
- double gates can be considered where there are issues of stock security. A box arrangement has been designed whereby once opened the first gate must be closed before the second gate can be operated to allow the user to continue. The key to the success of this arrangement will be the positioning of the gates and the allowance of suitable room for turning to ensure the gates are closed.

2.4.2 Horse Stiles

On some stretches of bridleway where no vehicular rights exist it may be necessary to deter motor bikes and cars with a physical barrier, often known as a horse stile. The presumption should however be in favour of avoiding use of such barriers unless there is a known problem unlikely to be overcome by pressure from legitimate users of the route.

The horse stile recommended for use on the Pennine Bridleway will consist of a single wooden sleeper with chamfered edges allowing a minimum width of 1.7metres (2.0m is better) between posts, and placed at a height of no more than 375mm (lower is better). Where a horse stile is placed on a slope the max. height should be 300mm. The landings either side of the barrier should be stoned to prevent puddles forming. A small gap below the sleeper will also help by allowing water to drain away. A gate should not be combined with the barrier as this will present too great an obstacle for some riders. Any horse stile used where access is from the road must be set back (*recommend 5m*) in case a horse chooses to jump the barrier unexpectedly.

2.5 RIVER AND STREAM CROSSINGS

Consultation with the Environment Agency is required when work is being planned in connection with any watercourse. Their consent is needed under the Water Resources Act 1991 s109 for work on "main" rivers and under the Land Drainage Act 1991 s23 for work on ordinary watercourses that might obstruct or impede river flow, such as new culverts. Approval must also be received for temporary interruption to normal flow that might occur during construction work.

2.5.1 Fords

Where conditions allow it a ford will be preferable to a bridge as this will allow horses access to water to drink. The flow pattern of the water course should be taken into account to ensure that the National Trail is not likely to be obstructed, for example if the river rises to unacceptable levels on a regular basis. The Environment Agency can assess the risk of flooding on main rivers, the local authority has the necessary information for ordinary

watercourses. Where a ford is created consideration should also be given to provision of a footbridge or stepping stones for use by walkers and cyclists.

A user should expect to find:

- that the entrance and exit to the ford are firm, stable and non-slip with a gentle slope (not more than 1 in 10). An aggregate path is unlikely to stay put where the level of the water course is subject to sudden fluctuations so a pitched path is recommended in such situations.
- that the base of the ford is reasonably level and firm with no deep holes or large boulders.
- that where the water course to be crossed is more than 4 metres wide, a depth pole has been provided.
- that in normal conditions the maximum depth will be no greater than 0.5m.
- that where the bed of the water crossing is soft or prone to shifting, an engineered surface will be provided using stone where possible.

2.5.2 Irish Fords

This is a method for providing a crossing over a small river or stream suitable for all users. The Irish ford can be used where the river banks are steep but not enough to warrant a bridge, or where it is preferable to avoid the users having contact with the water at all but times of high water (for example where the stream feeds a reservoir where there is concern over horse droppings in the water because of chemicals used in horse worming treatments).

The crossing features a concrete platform across large pipes. Dye can be added to the concrete to make it less stark and stones from the stream bed set into the concrete can also help disguise the material.

2.5.3 Sleeper Bridges

Where small streams or ditches have to be crossed and a culvert is not appropriate, a sleeper bridge can be provided. This kind of bridge is only appropriate where the span is less than 3m. The width should be a minimum of 1.5m (preferably 2m) with a kicking board provided. Where the drop is greater than 1m a parapet should be provided.

2.5.4 Bridleway Bridges

A user should expect to find the following features:

- the width of a small river bridge (up to 8m in length) should be at least 2m. If the river is wider or the crossing is of byway status, the width should be 4 metres or more depending on the expected level of use
- that the approach to the bridge does not include steps - any change in level should incorporate a non-slip ramp
- that the deck of the bridge will be stable and made of a substantial non-echoing material i.e. metal horse shoes on a metal bridge should be avoided

- that there should be no wide gaps in the decking through which the river below can be seen (max. gap between boards = 10mm, additional drainage can be provided by creating a gap between the deck and the kicking board of no more than 50mm)
- the deck should have a non-slip surface - this can be created by coating the surface with epoxy resin and bauxite grit
- that where a gate is required at the end of the bridge a turning area of at least 2.9m width is provided. Ideally the gate would be positioned in a fenced enclosure beyond the end of the bridge rather than on the bridge itself
- that parapets provided should be a minimum of 1.5m in height where the drop to the river is greater than 1m
- that a kicking board should be provided to infill from deck level to a height of at least 250mm
- that where the bridge ends and the track resumes there is no risk of a path user accidentally stepping off the decking onto any ground that falls away i.e. in the vicinity of the bridge abutments. If in doubt fencing "wings" should be used to prevent this.

2.5.5 Footbridges

Where a ford is constructed for horses a footbridge or, if appropriate, stepping stones, should be considered for use by walkers and cyclists. As the footbridge will be on a bridleway it should be accessible to cyclists as well as walkers i.e. steps should be avoided and the bridge should be wide enough to accommodate someone pushing a bike with panniers.

2.6 ROADS and ROAD and RAIL CROSSINGS

The Countryside Agency is keen to try and reduce the percentage of the National Trail that follows tarmac motor roads and will continue to look into opportunities to negotiate further off-road links.

2.6.1 Verges

When it is likely that users of the Trail will need to make use of a highway verge, either as a refuge whilst vehicles pass or as an alternative to the tarmac surface, they should expect to find:

- a level surface with no hidden holes or obstructions
- a safe, visible path to follow which is mown and/or maintained on a regular basis
- that where the verge is to be utilised beside a busy road, particularly one which is heavily used by HGV's, then the path should be as far from the carriageway as possible, with consideration given to the provision of a fence to separate the path from the road
- that an aggregate path has been provided where use is likely to be heavy and a natural surface was unlikely to be sustainable

2.6.2 Main Road Crossings

The assessment of road crossings is likely to concentrate on the visibility and other provisions required for horse riders which are generally more onerous than those for pedestrians and cyclists.

2.6.2.1 Highways Agency Advice

The Departmental Advice Note TA57/87 "Roadside Features" was issued by the Department of Transport in January 1989 and is now the responsibility of the Highways Agency (HA). Section 11 covers Roadside Facilities for Ridden Horses and provides guidance on road crossings, surface treatment, visibility and headroom. The desirable visibility distances are greater than those normally required for vehicles and so can be impractical or expensive to achieve. These are however recommendations rather than standards and so allow for balanced judgement covering safety, traffic densities and cost effectiveness at each road crossing.

85 percentile approach speed (kph)	50	60	70	85	100
Desirable visibility (metres)	135	168	211	270	345

Table 2: Visibility for Bridleway Crossings

2.6.2.2 Highways Agency Standards

The Departmental Standard TD9/93 "Highway Link Design" was issued by the Department of Transport in June 1993 and is now the responsibility of the Highways Agency. It contains requirements for stopping sight distances (SSD) which should be provided for vehicles approaching road crossings. These are based on the eye height of 1.05m for drivers and an object height of 0.26m which allows for a person, horse or object lying in the road.

Design speed (kph)	50	60	70	85	100
Desirable minimum (m)	70	90	120	160	215
One step below desirable minimum (m)	50	70	90	120	160

Table 3: Stopping Sight Distances (vehicles)

2.6.2.3 Proposed Standards for the Pennine Bridleway

Visibility Assessments:

Eye height 2.7m (at 3m back from edge of carriageway)
Object height 1.05m (at edge of carriageway)

Desirable visibility: as Table 2 above

Standing areas:

Width	5m
Length	5m

2.6.3 Grade Separated Crossings

The British Horse Society recommends:

- grade separated crossings on dual carriageway trunk roads
- grade separated crossings on single carriageway trunk roads where the Annual Average Daily Traffic has reached 10,000

2.6.3.1 Underpasses

Underpasses are preferable to bridges for crossing busy roads. The recommended head room is 3.4 - 3.7m. The minimum width recommended is 3m.

Gates in or at the ends of an underpass should be avoided where possible as horses can be panicked by the sound of vehicles passing overhead so the less time in the vicinity of the underpass, the better.

2.6.3.2 Bridleway Bridges over Major Roads

The Department of Transport Technical Memorandum BD52/93 specifies that for equestrian use bridges over major roads should have parapets 1.8m high consisting of a solid infill of 600mm at the base and mesh for the remainder.

Other consideration re. the approach to the bridge, turning areas and other desirable features are as given in connection with bridleway bridges over rivers (2.5.4).

2.6.4 Direct Crossings

General features of an acceptable at grade crossing:

- direct rather than staggered
- waiting areas have been provided where the route emerges from or leads onto a right of way (*recommend 4-10m wide, 5m depth from a gateway to the carriageway - a rider should be able to stand 3m back from the carriageway whilst waiting to cross*)
- horse warning signs on approaches to the crossing
- a coloured anti-skid strip across the highway to highlight the location of the crossing (*recommend 5m wide*)
- consultation and approval from the Highways Agency in connection with any works likely at a trunk road crossing

Where a grade separated crossing is not achievable other measures can be considered to try and improve the safety of the road crossing:

2.6.4.1 User Operated Warning Lights

- similar to school warning lights
- initiated by a button for walkers and cyclists and by a button or rod (see photo) for horse riders
- stopped automatically after the crossing period - timing to be defined by the width of the road, traffic flow, visibility etc

2.6.4.2 Mandatory User Operated Lights - Pegasus Crossings

Such lights may be required to cut down on waiting times where there are few natural gaps in the traffic flow. Examples are in use in Newmarket, Richmond, on the A63 Selby Road at Colton and at Warbottle in Tyneside.

2.6.5 Railway Level Crossings

Railway level crossings have only been included in the route where all attempts to find a grade separated crossing or alternative alignment have failed. It has been assumed that measures taken to improve the crossing for horses will account for any problems likely to be experienced by walkers/cyclists. The main problems facing horse riders at a level crossing are:

- the need to open and shut 2 gates quickly
- the risk of slipping on the wooden surface or the rails
- the possibility of the horse being panicked by a train whilst in the vicinity of the crossing

Any measures that can be taken to improve the efficiency of the gates, to produce a non-slip surface and to warn the rider of the imminent approach of a train (whilst still some distance from the crossing) will therefore help to reduce the risk. It has been suggested that the following could help:

- gates that are well hung, regularly maintained and which are exceptionally easy to open and preferably self-closing and latching
- plenty of space either side of the crossing so that a rider is not having to contend with a series of gates to put room between themselves and the crossing
- a coating of epoxy resin and grit applied to the timbers of the crossing to provide a less slippery surface
- a telephone connected to the nearest signal box from which riders can find out the time of the next train - this will preferably be located some distance from the crossing (i.e. not at the track side)

2.7 FENCES, WALLS AND HEDGES

Fences, walls and hedges alongside public bridleways will normally be the responsibility of the farmer or landowner although the Highway Authority may provide a rail or fence if necessary to safeguard users. In dealing with issues relating to field boundaries the following points should be taken into account:

- consideration will be given to funding the provision of a fence where the landowner has requested it to enclose new bridleway links running along a field edge. The type of fence and provision of gates should be included in the creation agreement. In most cases however it will be preferable to try and retain an "open" feel to the Trail
- consideration may be given to fencing the route where it passes through a field containing horses (following consultation with the landowner)
- where the route follows a path with a steep drop, a safety fence (*recommend post and rail*) should be provided if conditions allow it - where provision of a safety fence is not possible users should be informed of the potential risk by placing a notice at either end of the section in question giving information on the hazard and showing options for alternative routes
- as a general rule it is unlikely that the Countryside Agency will be able to fund the repair of existing stone walls forming the boundary of existing public bridleways, byways or RUPPs however each case will be considered on its merits.

2.8 SIGNS

2.8.1 Site Information Boards

It is expected that during works on site a site information board will be placed at either end of the section receiving attention. The purpose of the board is to inform anyone coming to use the right of way that the works in progress are being undertaken as part of the implementation of the Pennine Bridleway and to give them an idea of how long the operation and any associated disturbance may last. Contact numbers should be given for the supervisor of the contract as well as a number for anyone requiring further information about the Trail. It is also an opportunity to flag up the support given by the Lottery Sports Fund, the Countryside Agency and the partner authorities by using their respective logo's on the board.

Chapter 3

DESIGN INFORMATION SHEETS

Drawing Reference	Description
P1 (sheets 1 & 2 of 2)	Aggregate path
P2 (sheets 1 & 2 of 2)	Hymac path
P3	Grassed gravel path
P4	Slab path
P5	Stone pitched path
P6	Step detail
D1	Drainage - suggested layouts
D2	Piped crossing
D3	Masonry headwall
D4	Stone water break - shallow "v"
D5	Stone water break - pitched hump
D6	Ford - Irish
D7	Drainage ditch
D8	French drain
F1	Fencing - post & 3 rail
F2	Fencing - post & 4 rail
F3	Fencing - post & 5 rail
F4	Fencing - post & stock-proof netting
F5 (sheets 1 & 2 of 2)	Bridle gate - timber
F6 (sheets 1 & 2 of 2)	Field gate - timber
F7	
F8	Double gates
F9	Double stock-proof "box" gates
F10	Gateway in electrified fence
F11	Gate latch & drop bolt details
F12	Horse stile - timber
F13	Dry stone wall
B1	Bridle bridge - sleeper
B2	Bridle bridge - timber
S1	Horse warning sign
S2	Site information board
S3	Logos
M1	Revegetation & landscaping details
M2	Roadside waiting area
M3	Picnic table
M4	Mounting block
M5	Mounting ramp for disabled riders
M6 (sheets 1 & 2 of 2)	Seed & fertiliser details

Chapter 4 MAINTENANCE

4.1 MAINTENANCE GUIDE

As it is now the intention that a full maintenance guide will be produced specifically for the Pennine Bridleway, the information available within the design guide will be kept to a minimum.

4.2 SURVEYS & INSPECTIONS

It is anticipated that a full baseline survey of the route will be undertaken once it has opened followed by a programme of full surveys to be undertaken every 5 years. It is hoped that these surveys would be undertaken by the National Trail officer to be joined by a representative(s) from each Highway Authority as their particular section was reached.

Annual inspections should be undertaken by each authority to monitor the condition of the route and to identify any works required..

Where sections have been flagged up as experimental, a regular programme of inspections is expected until the end of the agreed period. Additional inspections may also be necessary following extreme weather conditions or known periods of heavy use (e.g. sponsored event).

It is also hoped that we may be able to encourage volunteers (from our user group contacts) to act as extra eyes on the ground and report any problems of which they are aware.

4.3 MAINTENANCE RECORDS

Current grant offers regarding construction works request that a maintenance record be prepared once the section of route for which the grant has been offered is in place. The intention is that this information can then be used to predict likely maintenance operations and associated costs.

For the time being it is anticipated that this maintenance record could take the form of a plan covering the section in question, annotated to show the following:

- gates - specifying whether a field or a bridle gate, whether timber or metal, whether existing or new (i.e. as part of contract), and type of catch
- structures e.g. bridges - type and material plus any other notes felt necessary
- culverts - location of pipes, drains etc. with a distance measure from the start of the section if necessary so the feature can be easily located in future
- ditches - position highlighted on plan, with length specified
- sections where clearance of vegetation is likely to be necessary - highlighted on plan and with length and width of cut specified

In addition to the above information other details may be found useful to assist with the compilation of an annual maintenance programme and to start to build an inventory for the route.

An example of a possible maintenance record for a section of the route in Lancashire is given below. The intention would be for this to accompany the annotated plan referred to above. *Please note that this is a prototype only - further consultation and work will be put into this for the maintenance guide proper.*

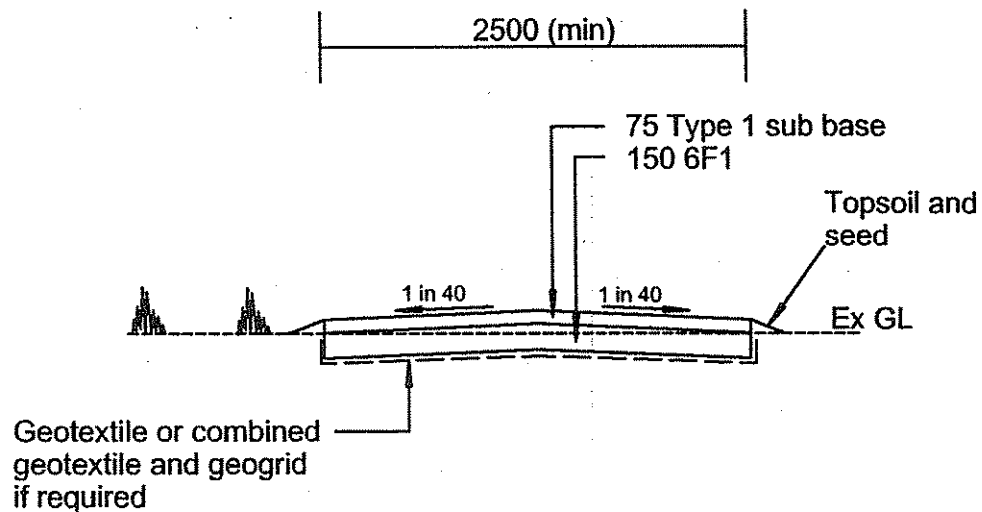
Prototype Maintenance Record : Lancashire County Council, Section L34 - Easden Clough

Surface	Length of section likely to be affected (m)	Number of items	Specify Type	Likely operation	Frequency of operation
Overgrowth Clearance	10			Cut to give 2.8m clearance	annual
Undergrowth Clearance	30			Cut 3m swathe	twice/yr, May/Sept.
Seed & fertiliser application	40			Broadcast seed/fert. mix	once, May
Drainage					
Open ditch	20			redig/deepen	approx. 5 year cycle
Piped culverts		4		clear silt/vegetation around entrance/exits	at least annually
Water breaks		8		clear silt/vegetation at ends and along break	at least annually
Furniture					
Bridle gates		4		check catch and general ease of use, grease hinges	at least annually
Field gates		2		as above	as above
Horse stiles		1		check structure for soundness, no sharp edges, firm landings	at least annually
River Crossings					
Fords		2	span <2m, pitched landings	check exits and base	frequently after construction
Bridges		1	sleeper, 2.5m span	check for loose decking and slippery surface, reapply resin and grit as necessary	at least annually

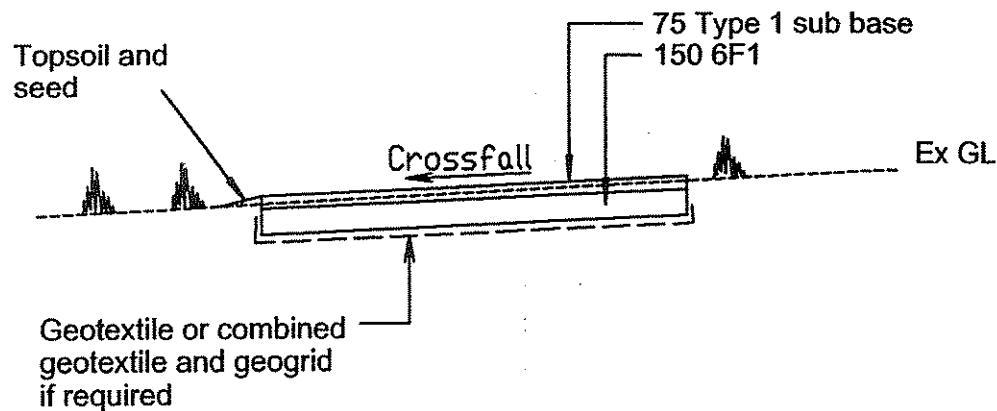
The idea is then that a table of unit costs would be created to enable the operations above to be priced and an estimated maintenance budget for the section in question identified.

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BRIDLEWAY WITH CAMBER



BRIDLEWAY WITH CROSSFALL

NOTE

1. Finished surface of bridleway to be raised above level of adjacent ground to allow water to run off.
2. Crossfall to be in range 1 in 30 to 1 in 40.

NOTES

1. Finished surface of bridleway to be raised above the level of the adjacent ground to allow water to run off.
2. Geotextiles and geogrids should only be used where layer separation is essential or where the substrata load bearing capacity means a path will not be adequately supported without them.
3. Geotextiles, if required, to be Terram 1000, Lotrak 16/15 or similar approved. Where crossing very weak ground the geotextile may be reinforced with a geogrid e.g. Tensar SS30.
4. Geotextiles and geogrids must not become exposed at path edges. They should be dug in at the sides of the path and covered to at least 225mm with aggregate or with turves and boulders to prevent them showing at or rising to the surface.
5. Geotextiles should not extend beyond the edges of the path as this can prevent revegetation.
6. Ideally aggregates should be sourced locally and chosen to blend sympathetically in colour and texture with the settings of the route.
7. Where the path is likely to be accessible to wheelchair a camber should be incorporated in preference to a crossfall.



**Pennine Bridleway
National Trail**

AGGREGATE PATH DETAIL

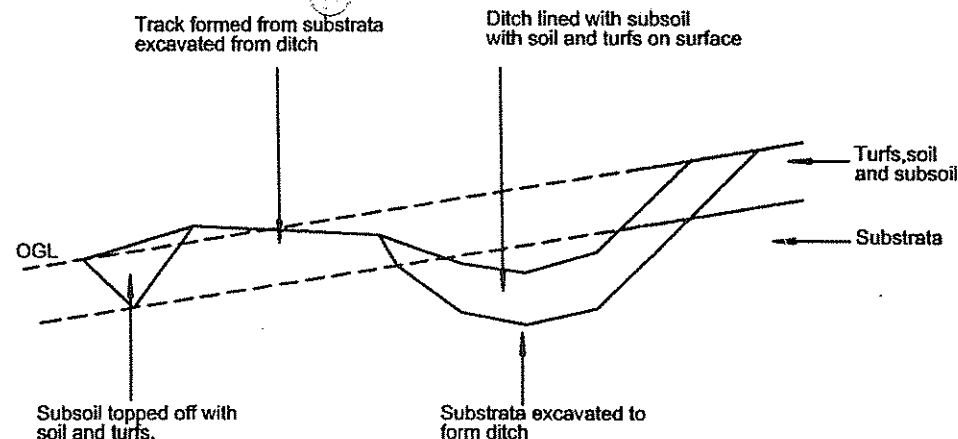
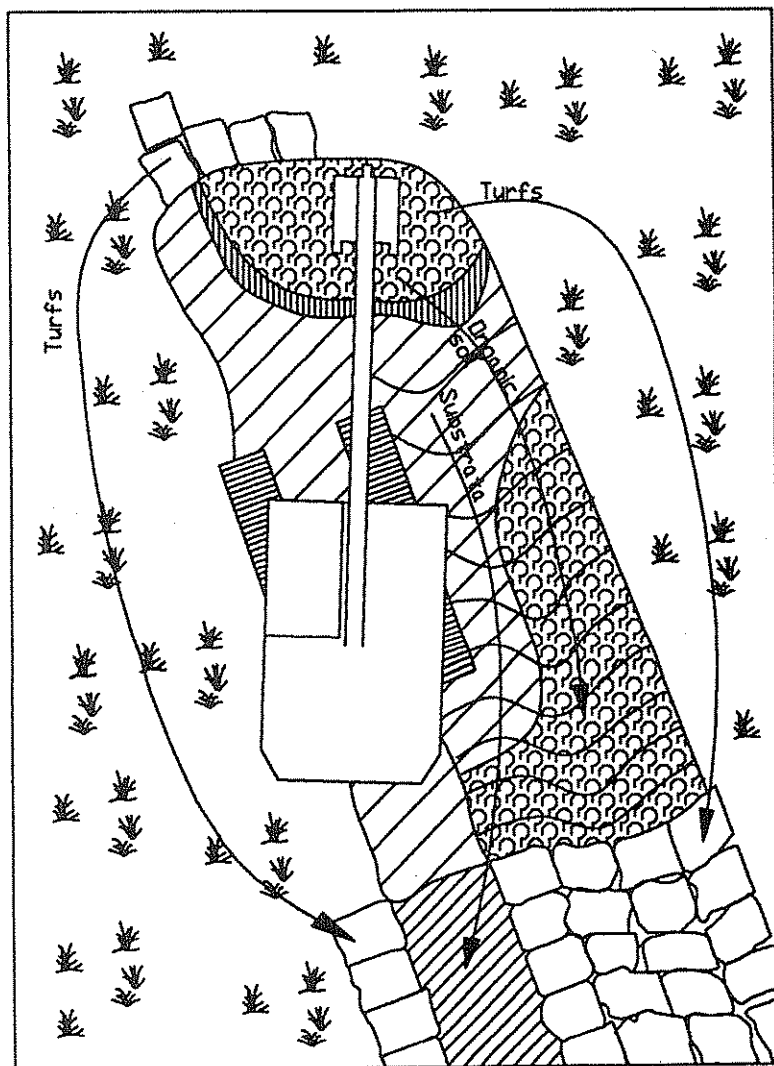
Source: Lancashire County Council

Issue	Date

Drawing No.

P1

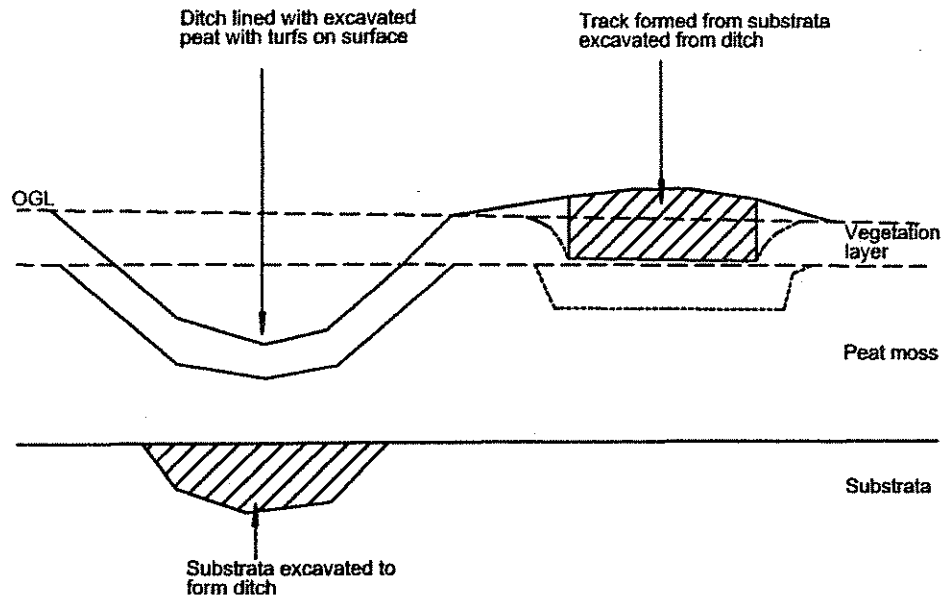
Sheet 2 of 2



TRACK CONSTRUCTION ON LEVEL OR SIDELONG GROUND

CONSTRUCTION TECHNIQUE

1. With the excavator, ideally a 12-15 tonne machine with bogmaster tracks, facing in the direction of advancing works remove the turf from the track route and the site of the adjacent ditch by cutting and tearing a large undamaged block of topsoil with flora attached.
2. Slew the excavator through 180 degrees to place the turf on the land adjacent to the track edge or in the ditch to reinstate the surface.
3. Remove any revealed organic material (subsoil) from the track to ensure a sound foundation and from the ditch to allow the substrata to be extracted. Use the subsoil to replace substrata extracted from the ditch.
4. Excavate substrata from the ditch and slew the excavator to transfer the substrata onto the track. Ensure large stones are in the bottom of the construction.
5. When adequate fill material has been deposited to bring the track to the required level shape up the track to the required camber and add fertiliser and grass seed to the surface. Compact the surface with the back of the bucket.
6. Repeat the process as the machine moves ahead along the route of the track.
7. Where the substrata is unsuitable for track construction or the levels require a large upmake additional fill material may be obtained by forming an additional ditch on the downhill side or from borrow pits adjacent to the track as agreed with the Engineer.
8. If required by the Engineer spread and compact 40mm of clean gritstone (20-40mm) into the surface of the completed track.



TRACK CONSTRUCTION ON PEAT MOORLAND

DRAINAGE

1. Form the track with a pronounced camber or crossfall 150-200mm above the original ground to prevent water ponding on the track.
 2. Finished ditches must have a smooth base formed on a grade to prevent stagnation and must be profiled to a smooth cross section as a base to improve the re-establishment for the reinstated turfs.
 3. During construction put in culverts (ditch crossings) to dispose of water from ditches on the uphill side. Ditch crossings to consist of a 300mm diam plastic pipe extending a minimum of 1m from the sides of the track with masonry headwalls at either end.
- Location of ditch crossings to be agreed on site.

CONSTRUCTION TECHNIQUE ON PEAT MOORLAND (PEAT 1.0-2.5M DEEP)

1. Excavate ditch on the uphill side of the track deep enough to gain access to the substrata.
2. Excavate substrata and deposit onto the top of the undisturbed surface mat of vegetation on the route of the track to form a layer approx 600mm deep.
3. Replace the excavated peat into the ditch and relay the excavated turfs to leave a shallow depression and to blend the track edges.



**Pennine Bridleway
National Trail**

HYMAC PATH

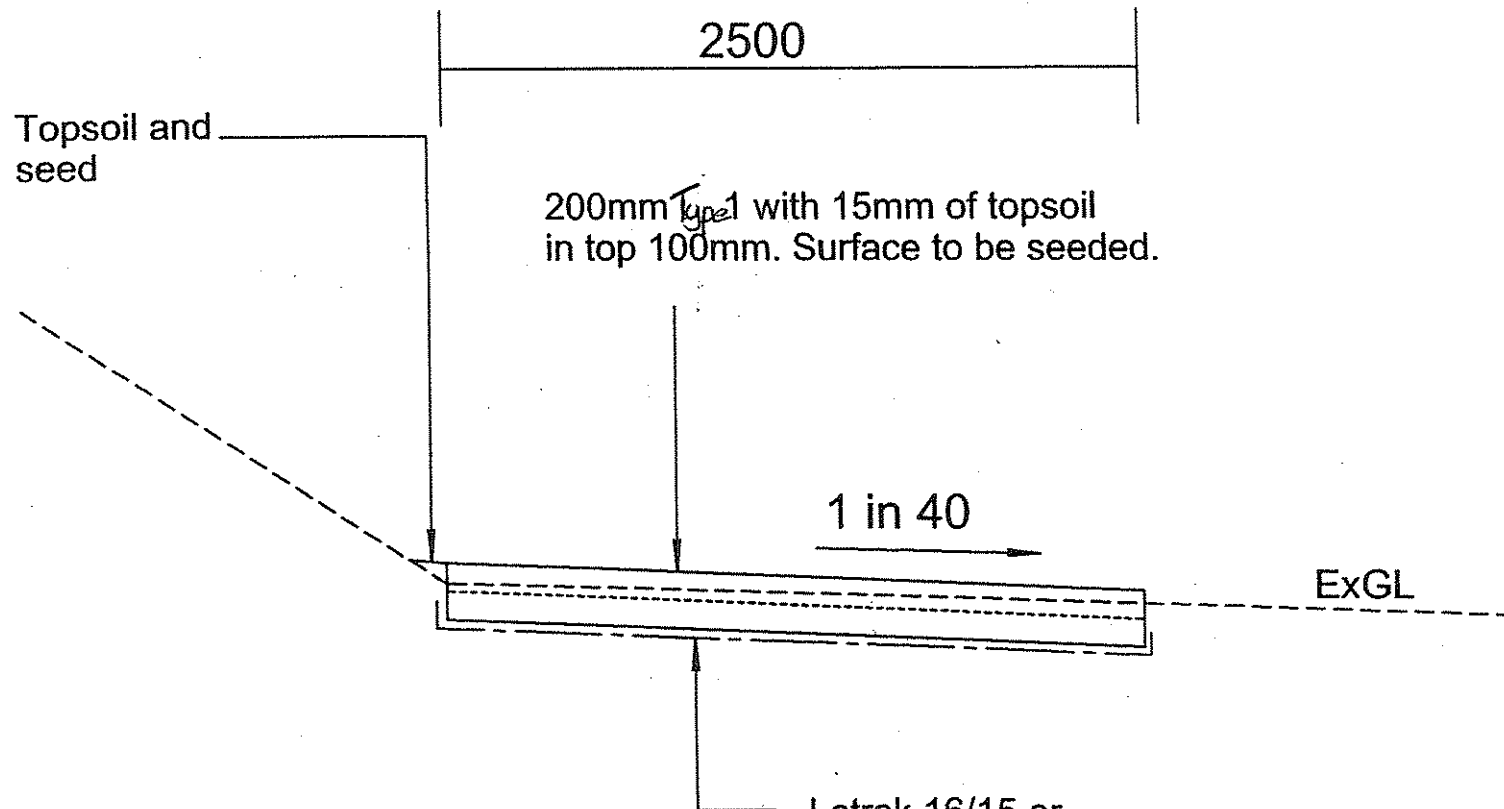
Source: Lancashire County Council

Issue	Date

Drawing No.

P2

Sheet 2 of 2



NOTES

1. Topsoil may be rotovated into 100mm layer or combed in with the teeth of a machine bucket.
Topsoiled layers to be gently rolled once seeded.

2. Bridleway surface to be 50mm above existing ground at low edge.

(Type 1 = approx. 2" down to dust)



**Pennine Bridleway
National Trail**

GRASSED GRAVEL CONSTRUCTION

Source: Lancashire County Council

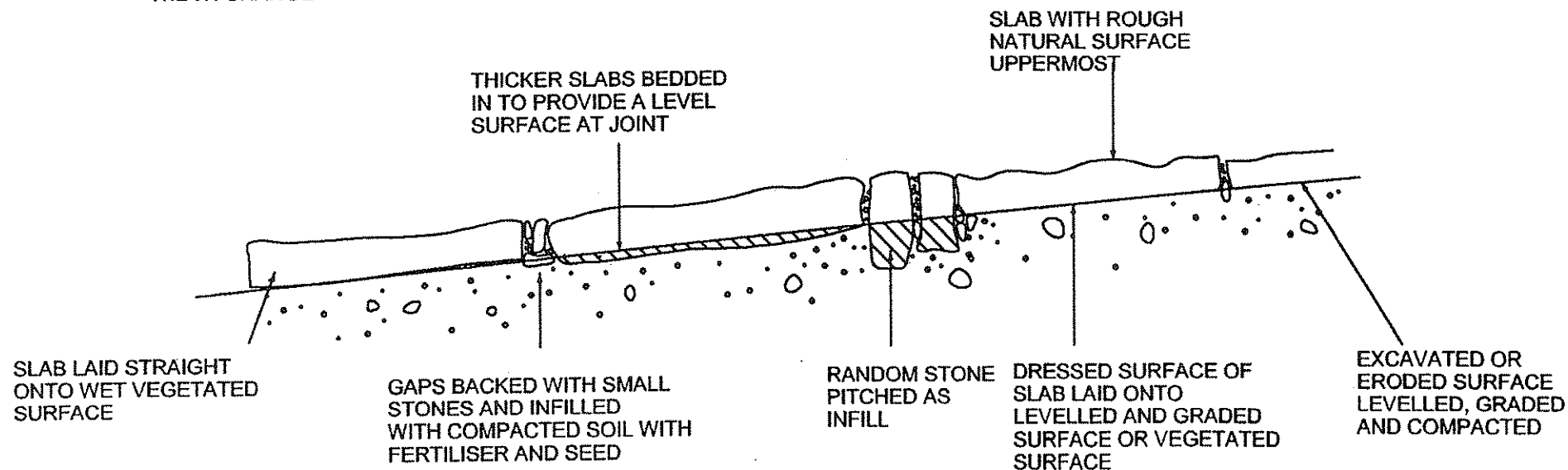
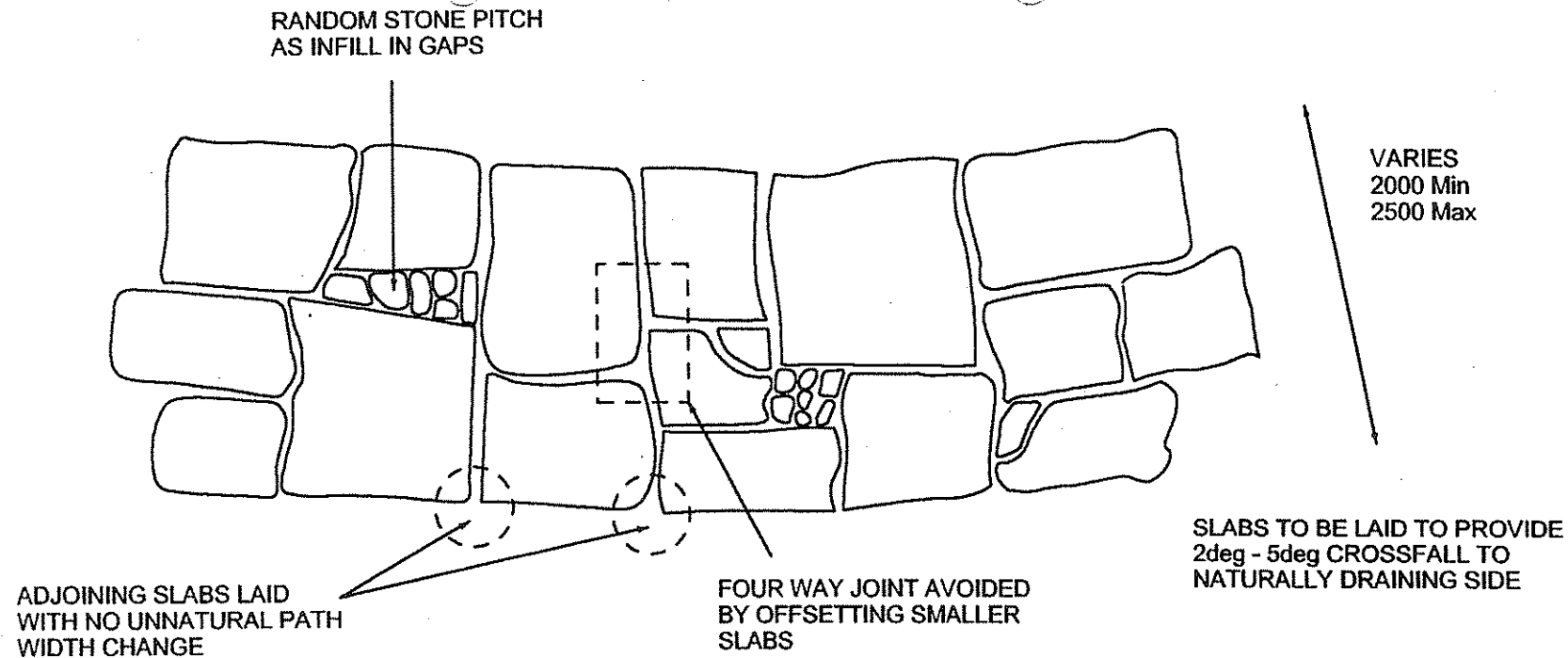
Issue	Date

Drawing No.

P3

Sheet 1 of 1

PLAN



**Pennine Bridleway
National Trail**

STONE SLAB PATH

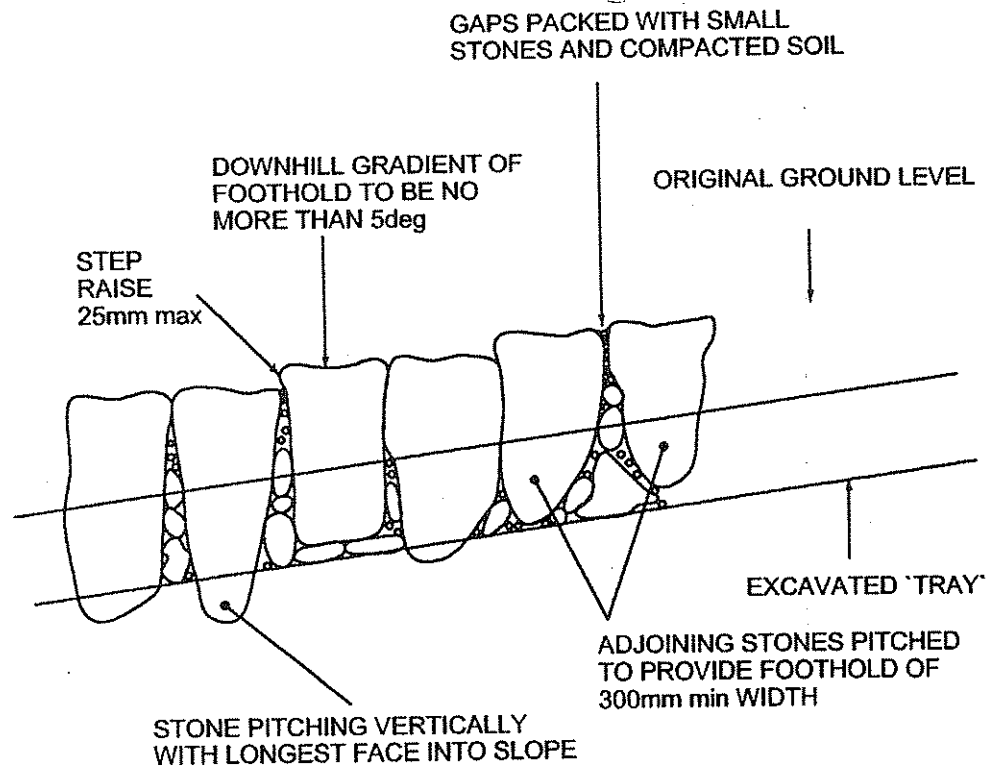
Source: adapted from Cleveland Way National Trail

Issue	Date

Drawing No.

P4

Sheet 1 of 1



SECTION ALONG TRACK

GENERAL TECHNIQUE

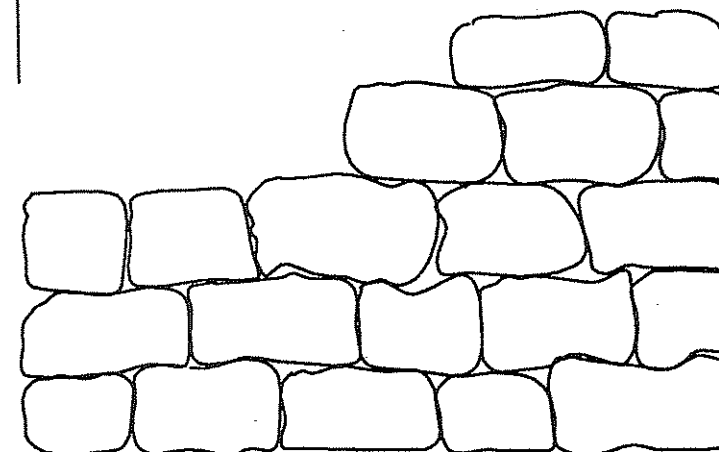
1. Excavate to required depth. On stony or firm ground this will equal to long axis of the selected stone.
2. Excavate soft spots and fill with suitable material e.g. Type 1 sub base.
3. Lay stones working uphill, fitting stones together as tightly as possible and filling any remaining gaps with small stones and compacted soil.

4. Avoid long blocks of small stones between key stones as small stones tend to sink pushing the key stones out of position.

NOTE

Stone pitching should only be used for short sections of bridleway, particularly on approaches to fords.

VARIES 2000 min - 25000 max



PLAN



**Pennine Bridleway
National Trail**

STONE PITCHED PATH

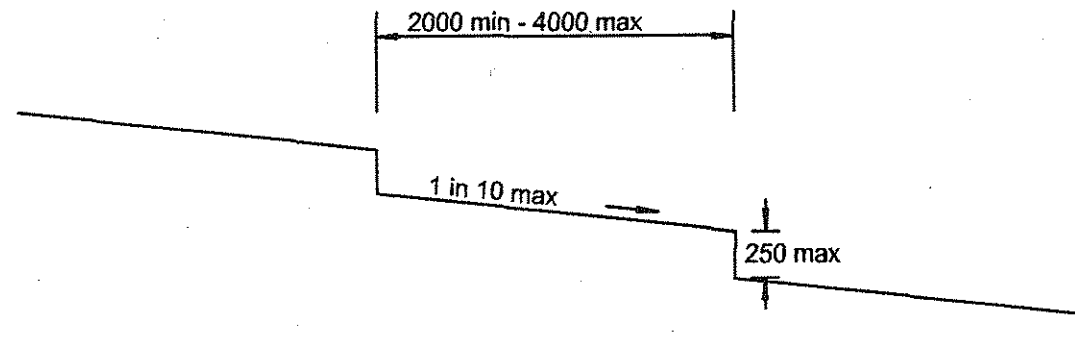
Source: Lancashire County Council

Issue	Date

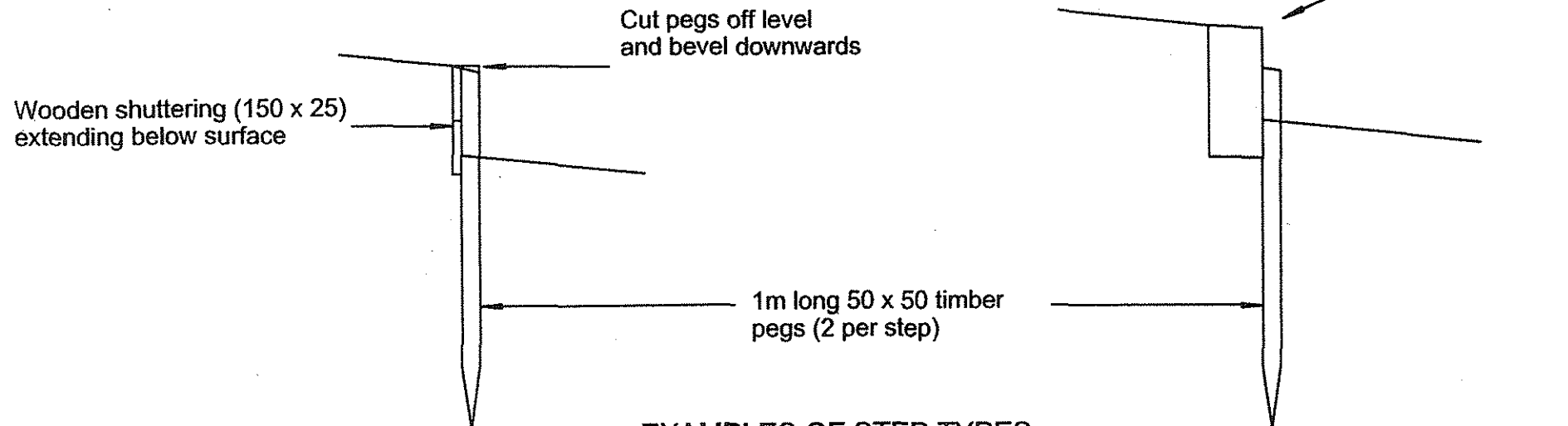
Drawing No.

P5

Sheet 1 of 1



ELEVATION

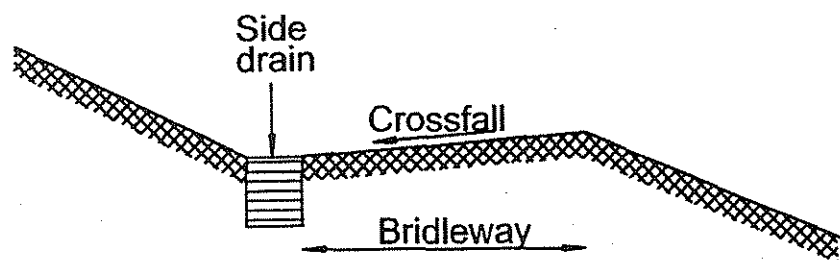


EXAMPLES OF STEP TYPES

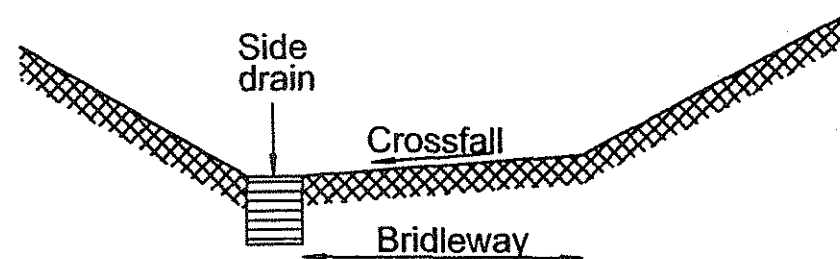
NOTES

All timber to be factory pressure impregnated with "Tanolith or equivalent to BS4042

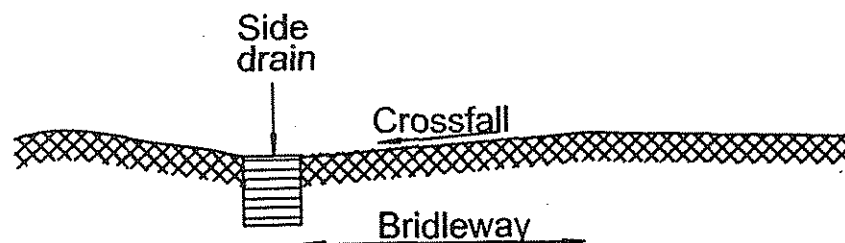
ALL DIMENSIONS IN MILLIMETRES



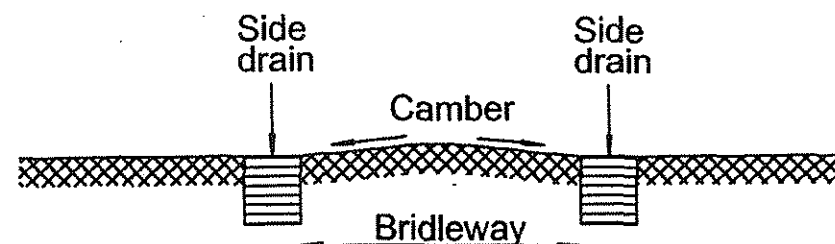
UPLAND CONTOUR PATHS



SUNKEN PATHS



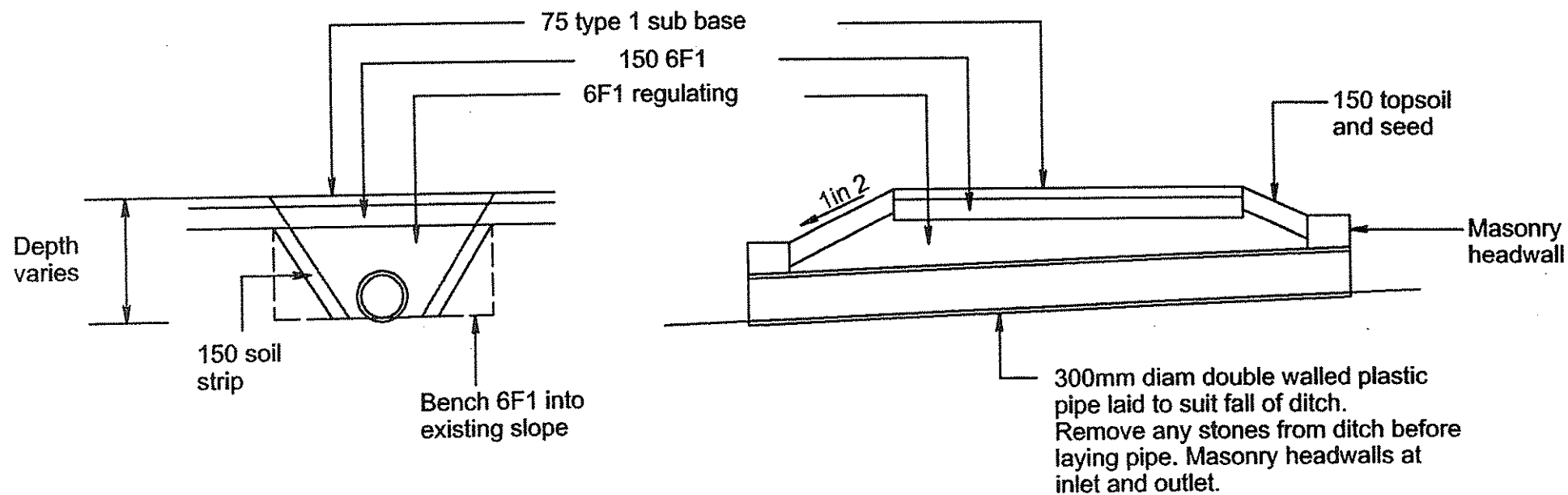
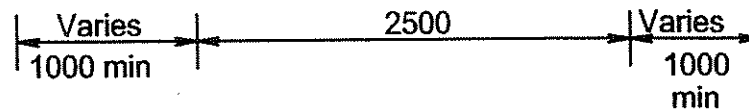
PATHS RUNNING DIRECTLY DOWN SLOPES

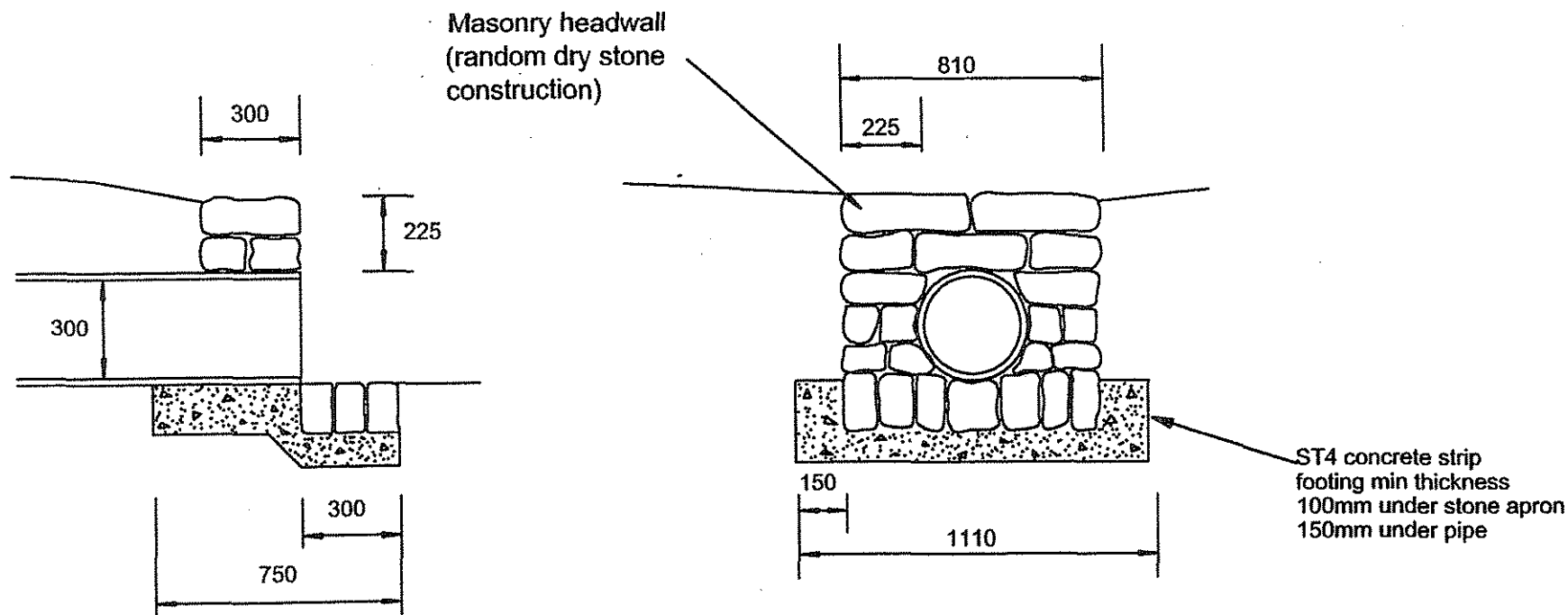


NOTES

1. Side drain may consist of French Drain or 500mm deep ditch.
2. Top edge of ditch to be 300mm min from edge of bridleway.
3. French drain preferable to open ditch in narrow sunken lanes

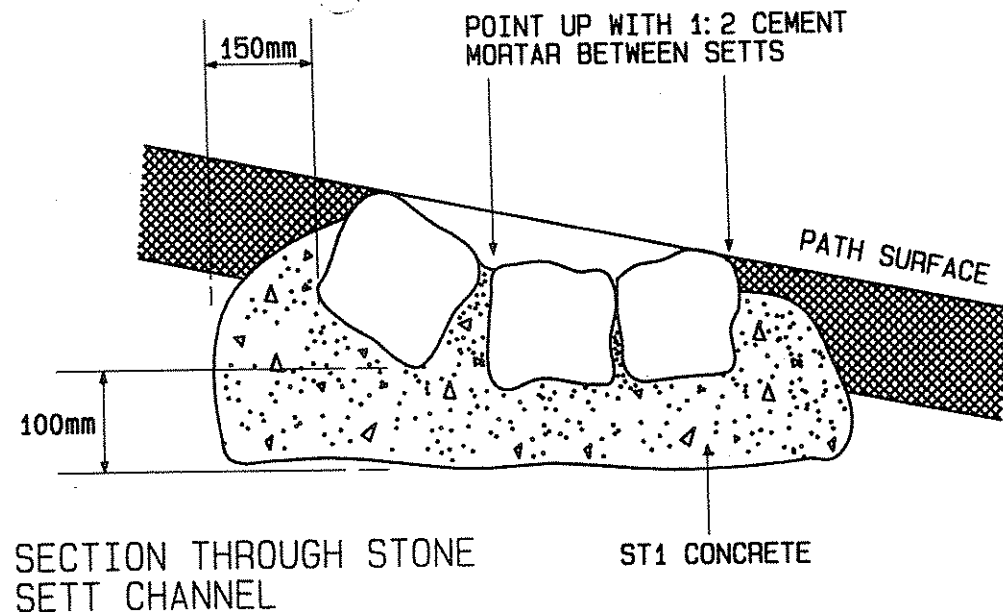
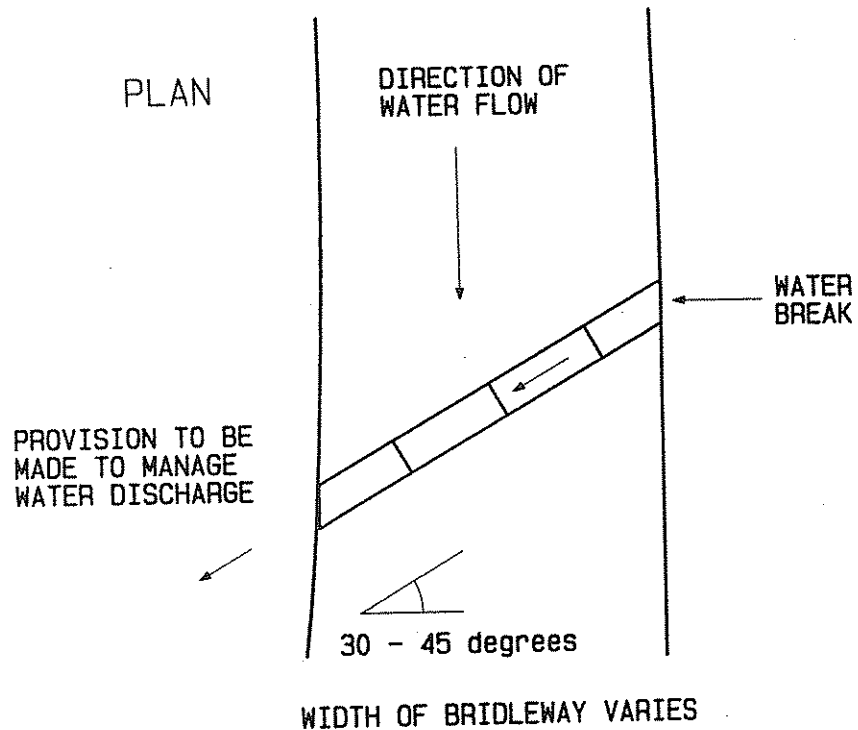
Total length of pipe depends on depth of ditch below surface of bridleway



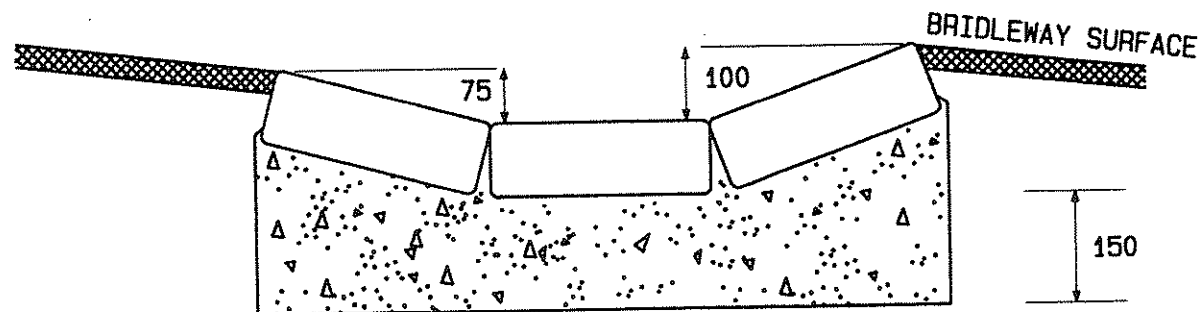


NOTES

1. All drainage pipes that are put in under the bridleway are to extend a minimum of 1m from either edge of the bridleway.
2. Where ditch crossing consists of 2 No 300mm diam pipes side by side headwall to be 1160mm wide.



WATER BREAK CONSTRUCTED TO SUIT
REQUIRED CROSSFALL OF EXISTING
BRIDLEWAY



SECTION THROUGH STONE
KERB CHANNEL

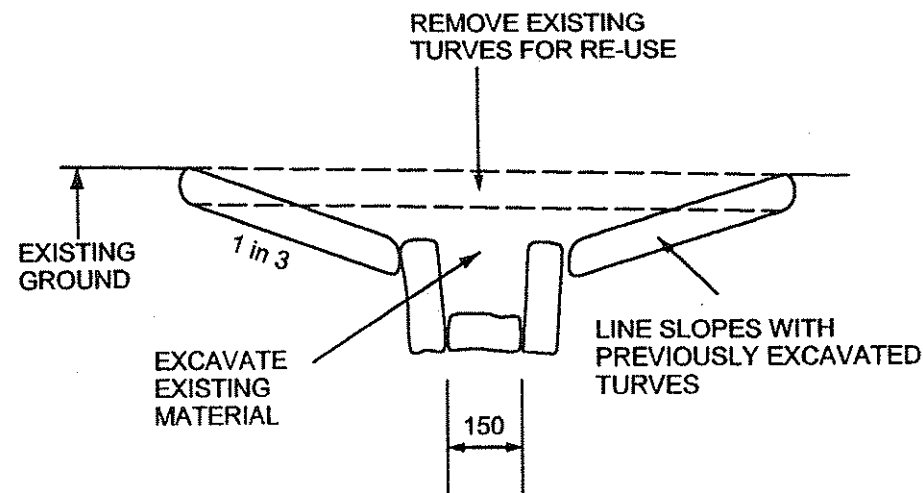
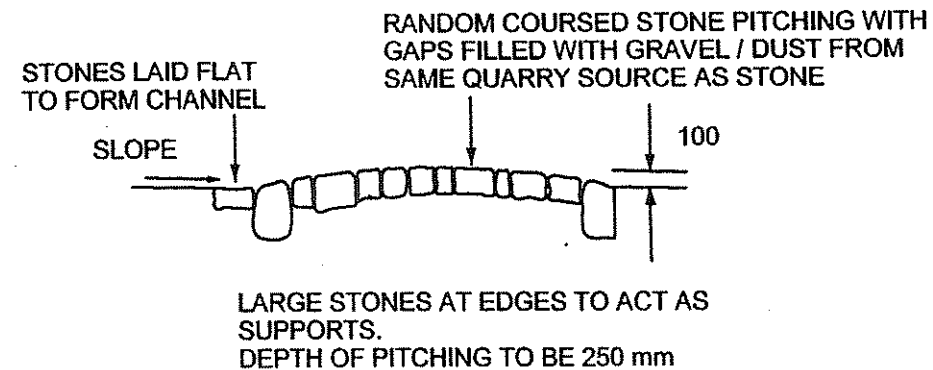
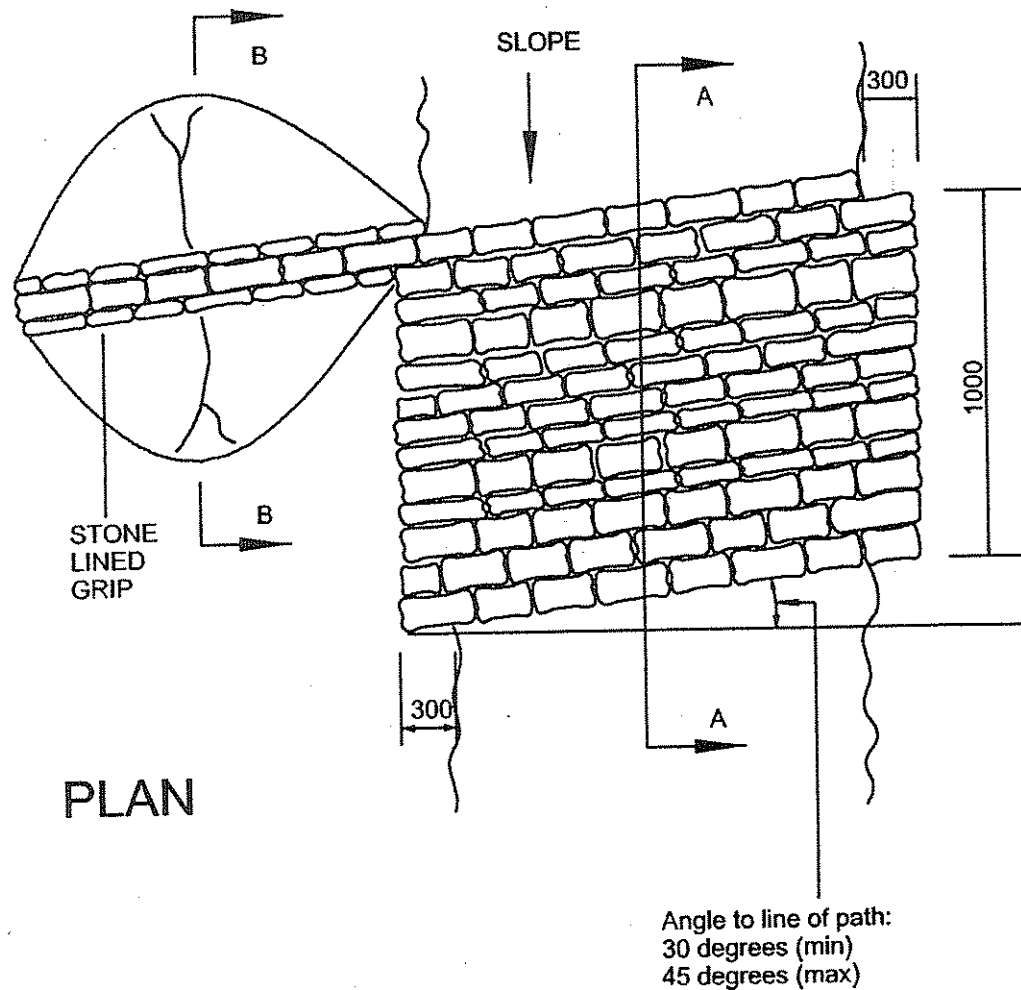


**Pennine Bridleway
National Trail**

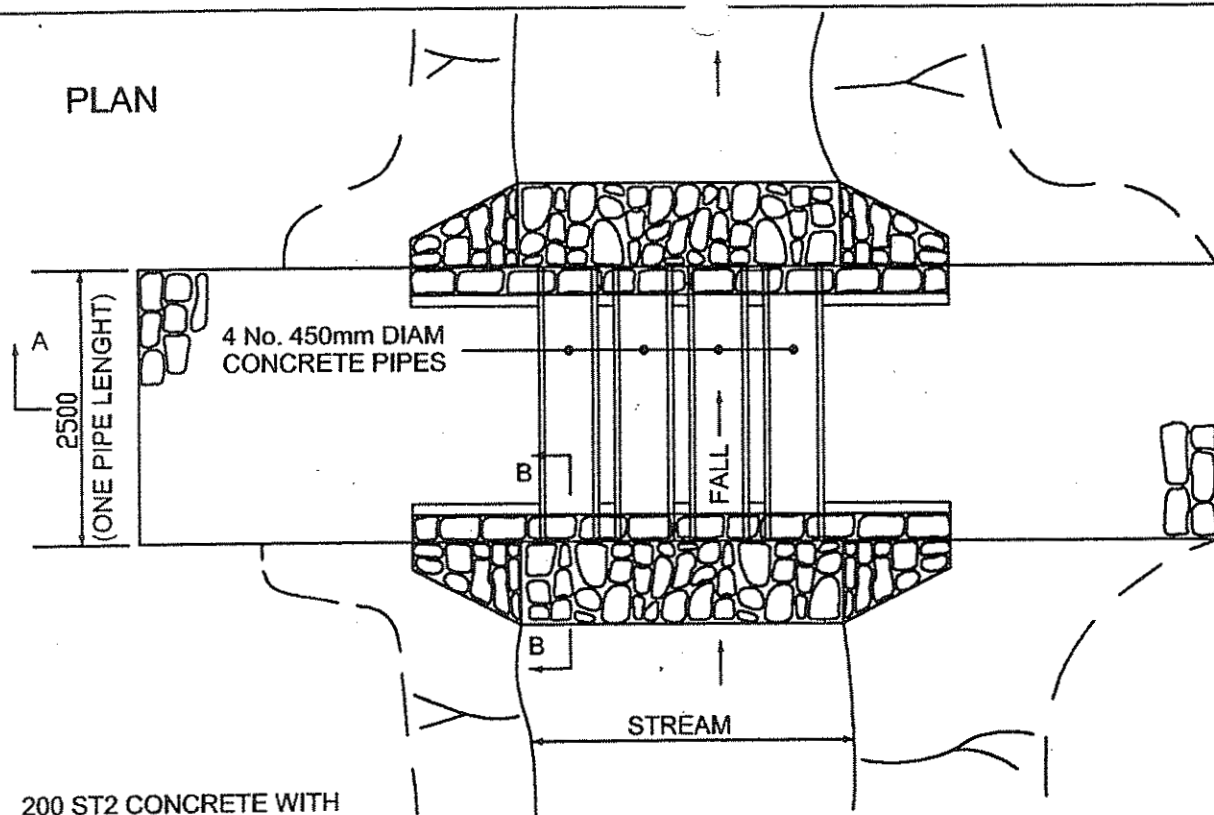
STONE WATER BREAK - SHALLOW "V"

Source: adopted from Rochdale MBC, Tameside MBC

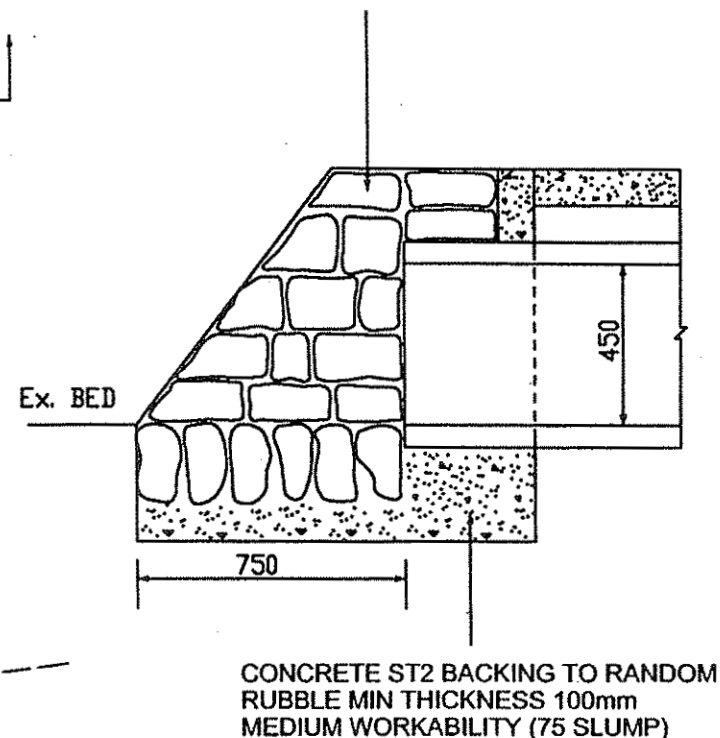
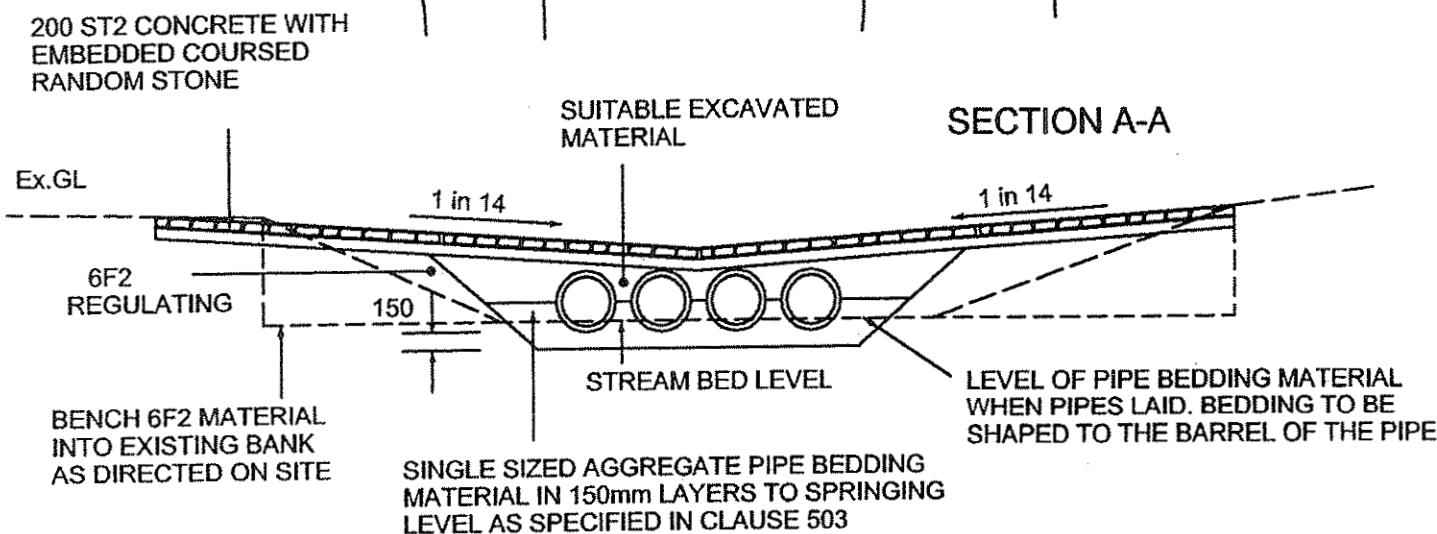
		Drawing No.
		D4
Issue	Date	Sheet 1 of 1

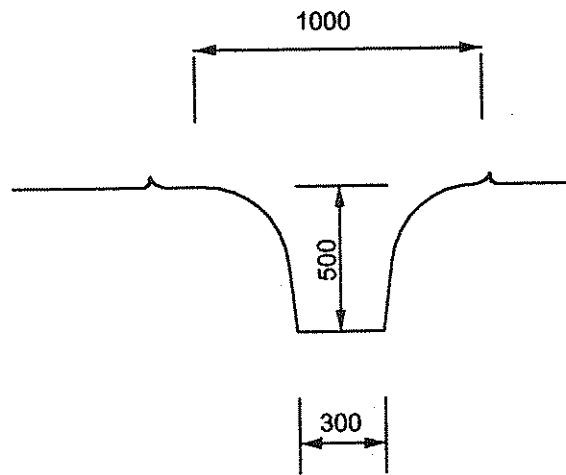


PLAN

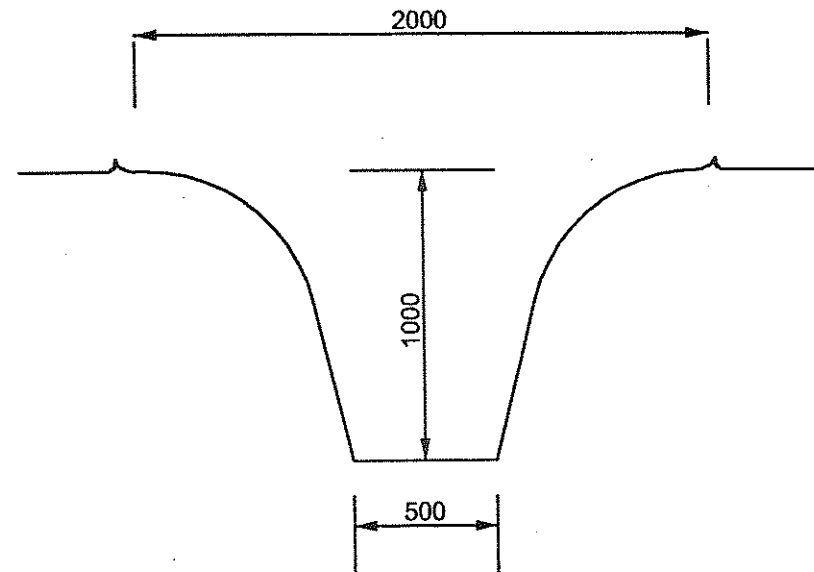


250mm COURSED RANDOM RUBBLE IN LINING OF
SIDE SLOPES AND BED, BEDDED, JOINTED
AND POINTED WITH CEMENT MORTAR CLASS 1.
SLOPE OF WALLS TO SUIT EXISTING STREAM BANKS.
STONES IN BED TO BE RETRIEVED FROM
EXISTING BED.





500mm DEEP DITCH



1000mm DEEP DITCH

NOTE

1. Sides angled so that surface width is at least twice the width of the base.



**Pennine Bridleway
National Trail**

DRAINAGE DITCH

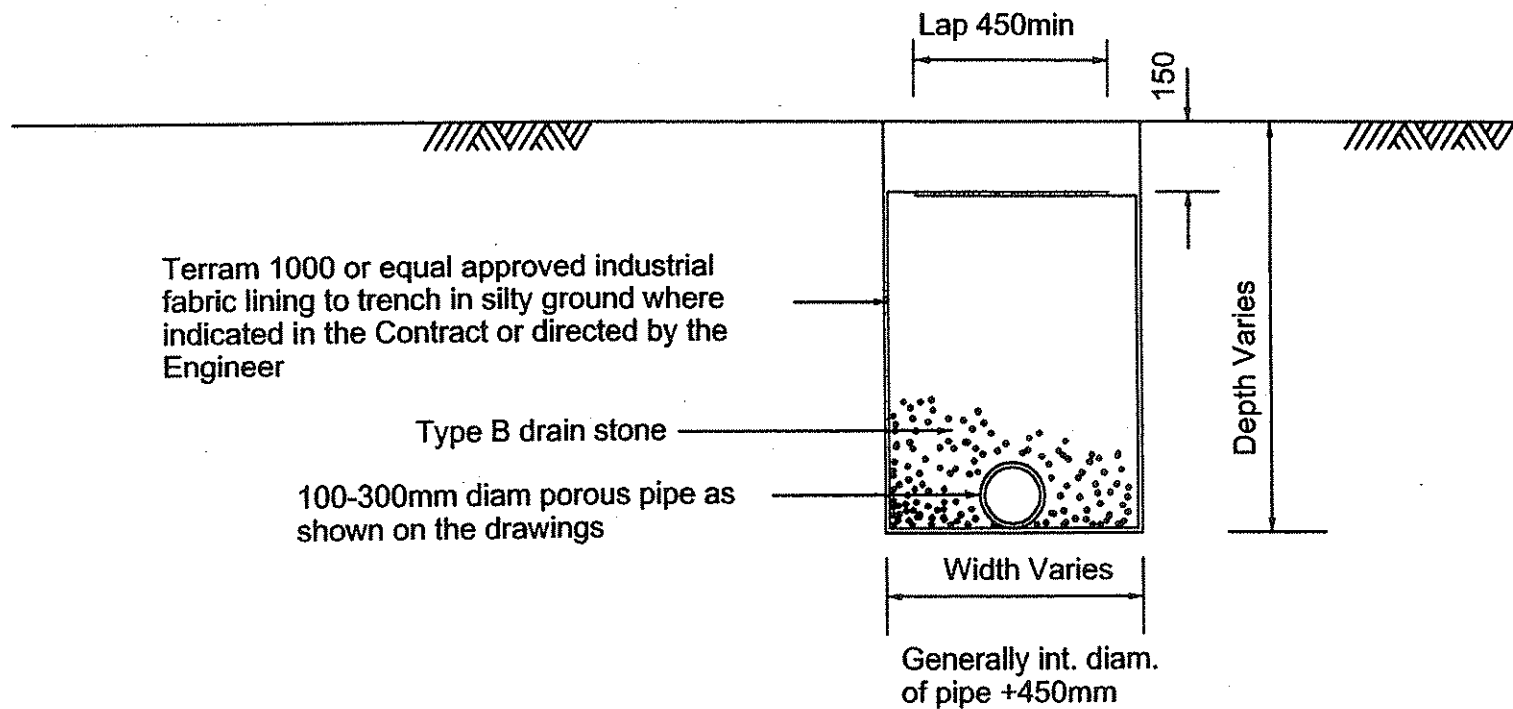
Source: Lancashire County Council

Issue	Date

Drawing No.

D7

Sheet 1 of 1



**Pennine Bridleway
National Trail**

FRENCH DRAIN

Source: Lancashire County Council

Issue	Date

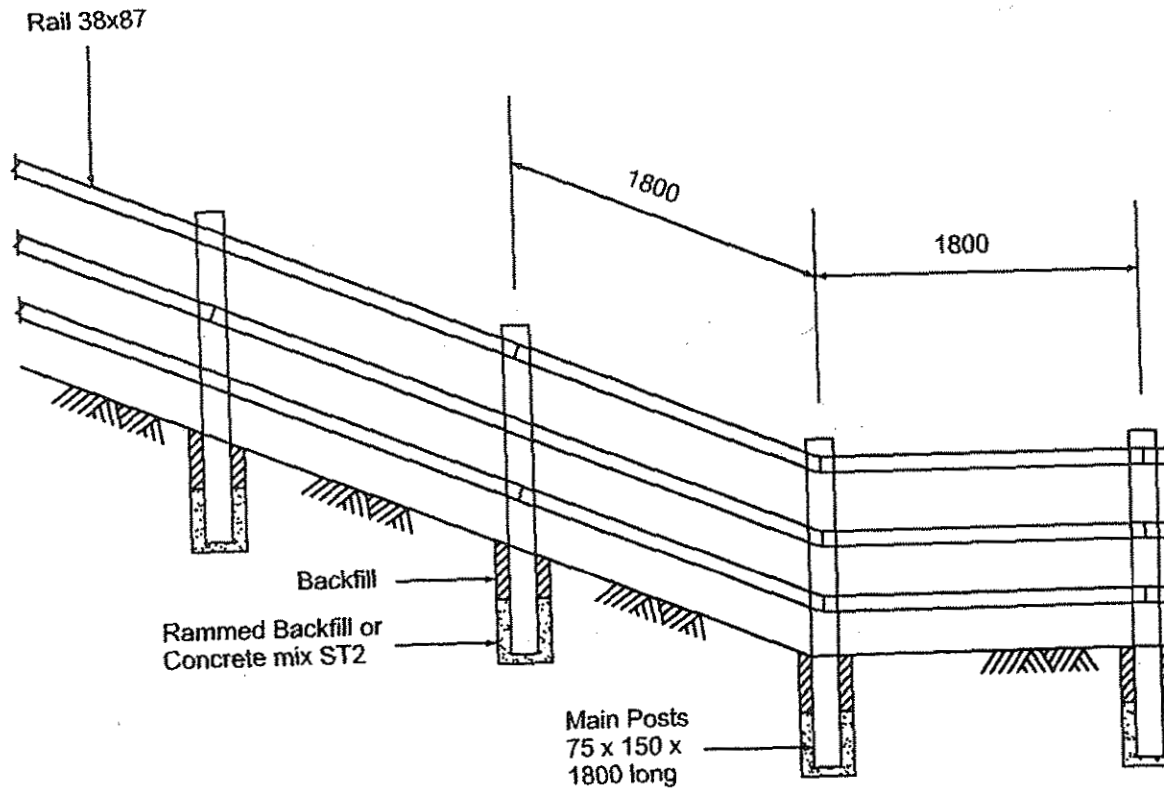
Drawing No.

D8

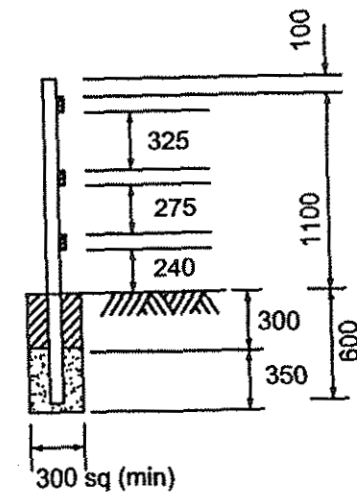
Sheet 1 of 1

NOTES

1. BS 1722 Part 7 Type SPR 11/3 applies unless otherwise stated.



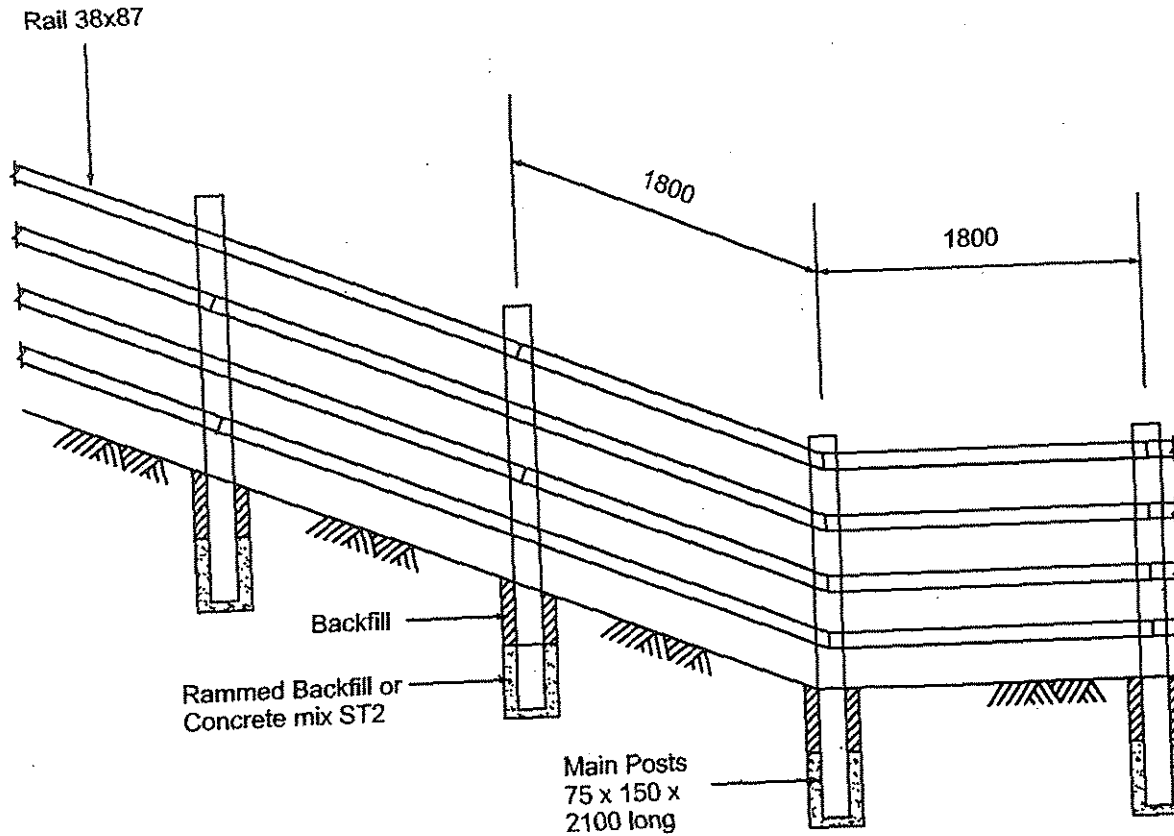
GENERAL ARRANGEMENT



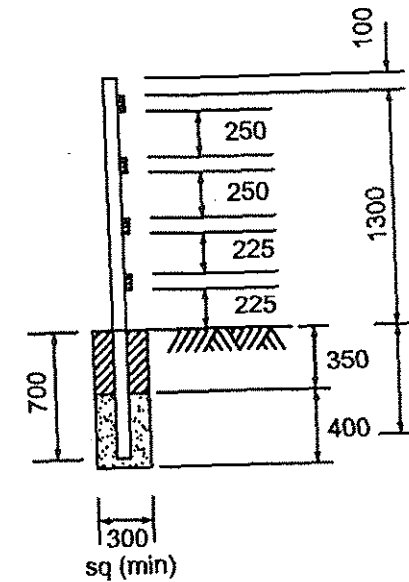
SECTION THROUGH
CENTRE OF MAIN POSTS

NOTES

1. BS 1722 Part 7 Type SPR13/4 applies unless otherwise stated



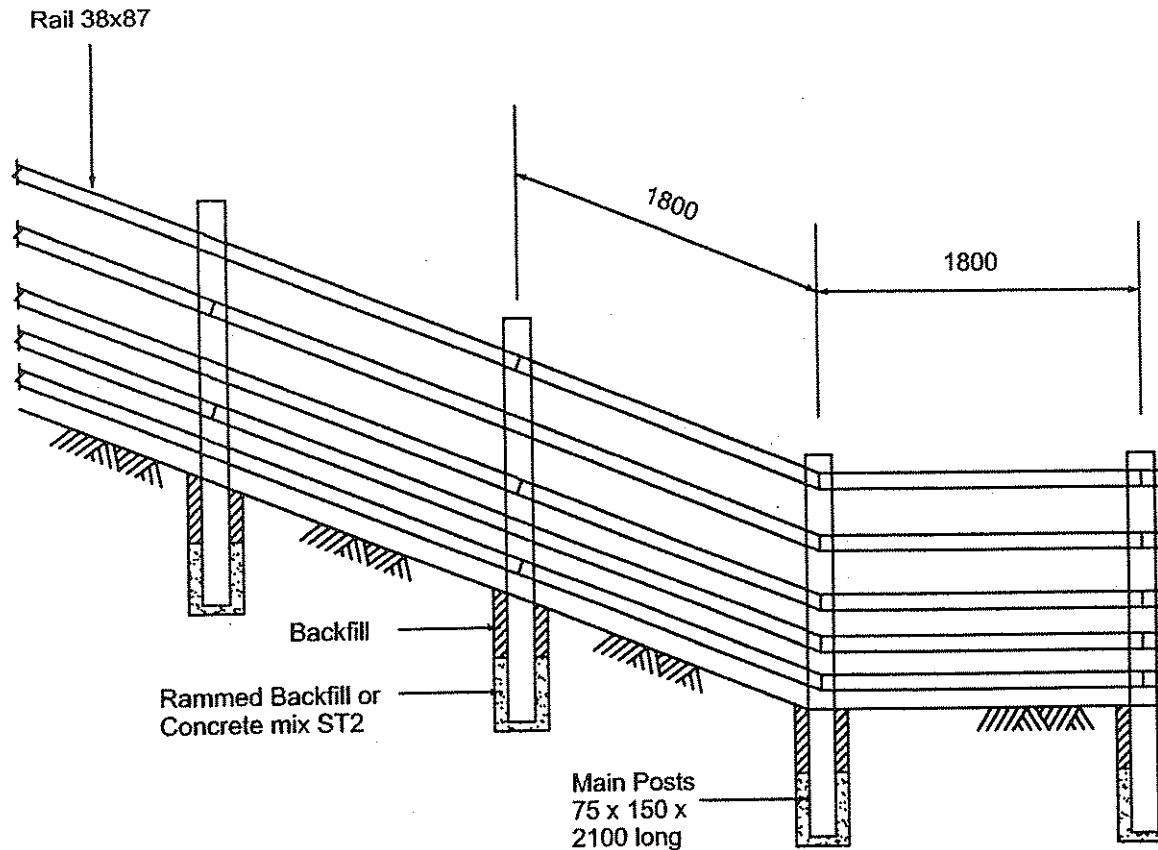
GENERAL ARRANGEMENT



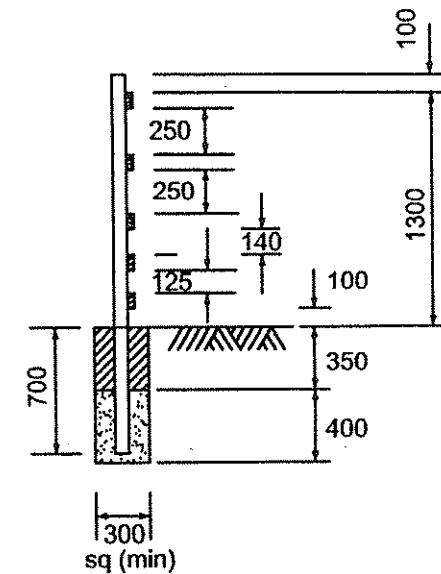
SECTION THROUGH CENTRE OF MAIN POSTS

NOTES

1. BS 1722 Part 7 Type SPR 13/4 applies unless otherwise stated.
2. All dimensions are in millimetres.



GENERAL ARRANGEMENT



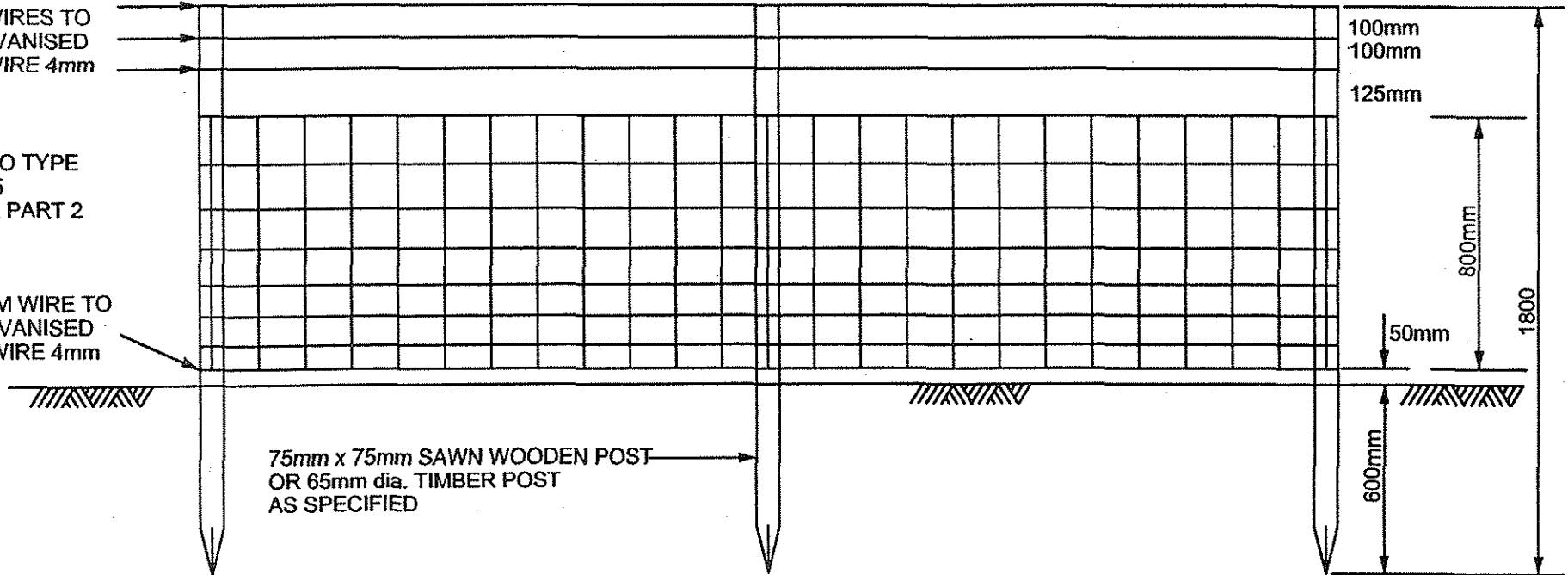
SECTION THROUGH
CENTRE OF MAIN POSTS

FENCE TO COMPLY WITH BS1722 PART2

TOP 3 WIRES TO
BE GALVANISED
PLAIN WIRE 4mm

MESH TO TYPE
B8/80/15
BS 1722 PART 2

BOTTOM WIRE TO
BE GALVANISED
PLAIN WIRE 4mm



75mm x 75mm SAWN WOODEN POST
OR 65mm dia. TIMBER POST
AS SPECIFIED

NOTES

1. Straining posts and struts as detailed in BS1722 Part 2.
2. 50mm gap required between mesh/bottom wire and ground.



**Pennine Bridleway
National Trail**

FENCING - POST AND STOCK-PROOF NETTING

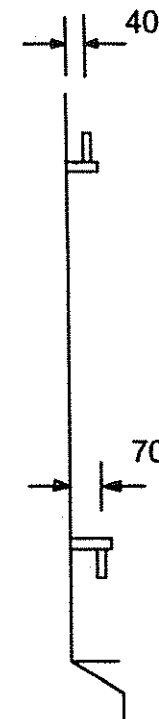
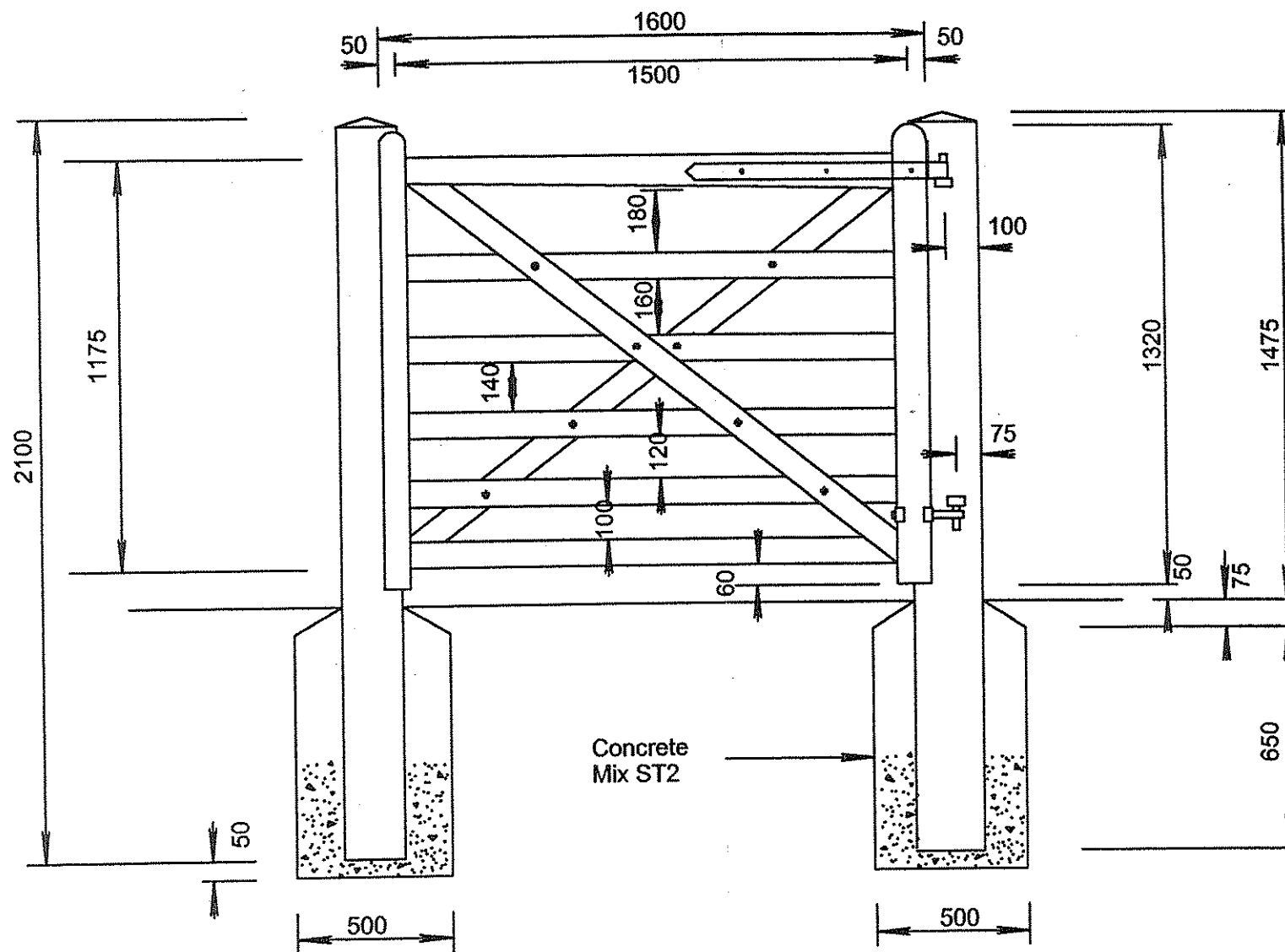
Source: Lancashire County Council

Issue	Date

Drawing No.

F4

Sheet 1 of 1



Elevation showing approx. distance between gudgeons and hanging post to make gate self closing.

NOTES

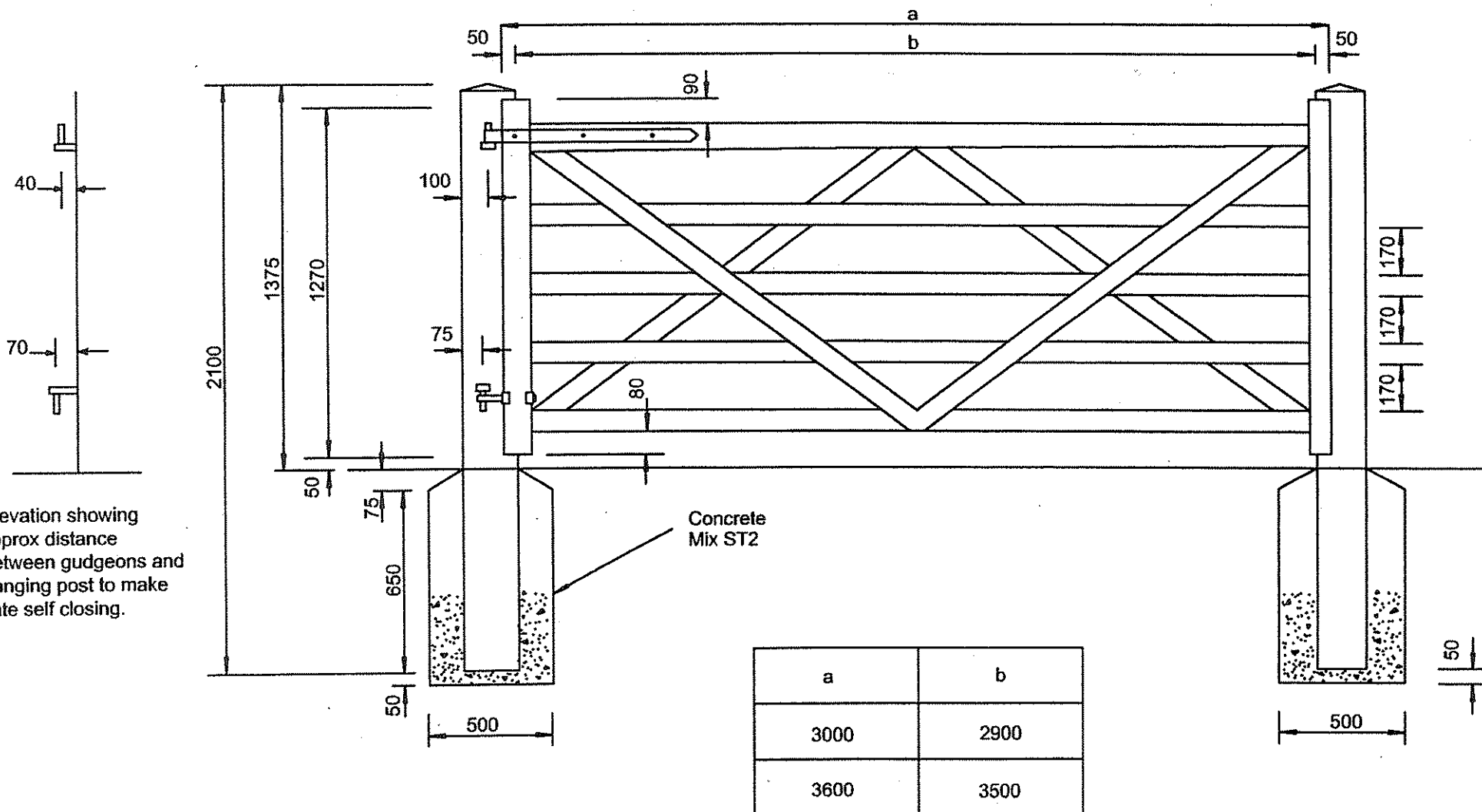
All dimensions in millimetres unless otherwise stated.

1. Top and bottom rail to be morticed full width and pegged with 13mm diam oak dowels. Others half morticed. Braces to be morticed to stiles and bolted to rails.
2. Gates and posts to be treated larch, factory pressure impregnated with 'Tanolith' or equivalent to BS4072. All cuts to be similarly treated.
3. Gates to be fitted with captive hinge set as detailed. Top strap band to have eye on corner as supplied by Centrewire Ltd (tel 01491 614490) fitted with eye adjacent to post. Bottom fitting to be adjustable. Gate must be self closing.
4. Gates to be fitted with safety gate hooks as supplied by Eliza Tinsley of Reddale Road, Cradley Heath, West Midlands B64 5JF (Product No 4204002) or equivalent approved located on top of top rail.
5. Where gate is likely to be used by wheelchairs gates to be fitted with Easy Latch as supplied by Centrewire Ltd.
6. All metal fittings and screws to be heavily galvanised to BS729.
7. Gates to open as detailed on drawings.
8. Gates to comply with BS 5709.
9. Gates to be sited on level ground.
10. Stone landing to be provided 2m either side of gate.

DESCRIPTION OF TIMBER MATERIALS

SIZE (mm)

Hanging post	200 x 200 x 22100 long
Shutting post	175 x 175 x 2200 long
Hanging stile	100 x 75
Shutting stile	75 x 75
Top rail	100 x 75 tapering to 75 x 75
Under rails	75 x 25
Braces housed in top rail	75 x 75



Elevation showing approx distance between gudgeons and hanging post to make gate self closing.

a	b
3000	2900
3600	3500

DETAILS OF TIMBER FIELD GATE

NOTES

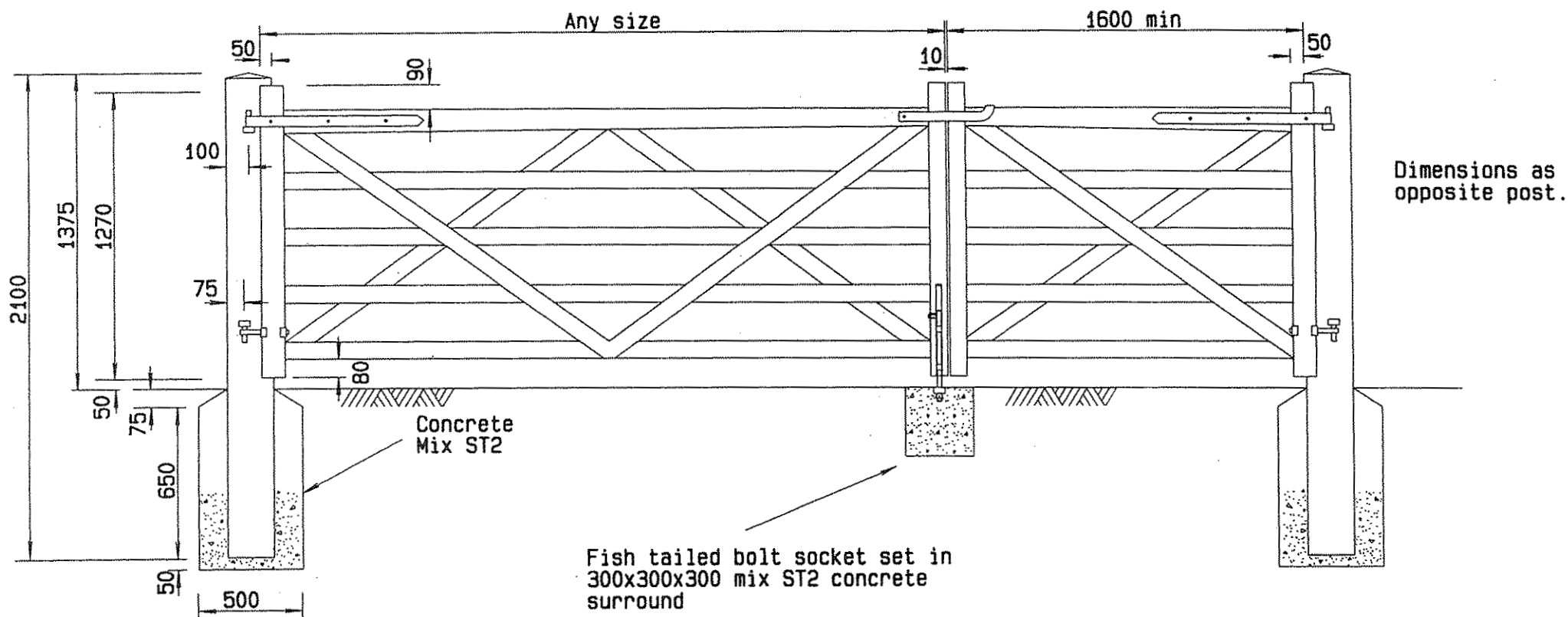
All dimensions in millimetres unless otherwise stated.

1. Top and bottom rail to be morticed full width and pegged with 55 mm diam oak dowels. Others half morticed. Braces to be morticed to stiles and bolted to rails.
2. Gates and posts to be treated larch, factory pressure impregnated with 'Tanolth' or equivalent to BS4072. All cuts to be similarly treated.
3. Gates to be fitted with captive hinge set as detailed. Top strap band to have eye on corner, as supplied by Centrewire Ltd (tel 01491 614490) fitted with eye adjacent to post. Bottom fitting to be adjustable.
Gate must be self closing
4. Gates to be fitted with safety gate hooks as supplied by Eliza Tinsley of Reddale Road, Cradley Heath, West Midlands B64 5JF (Product No 4204002) or equivalent approved located on top of top rail.
5. Where gate is likely to be used by wheelchairs gates to be fitted with Easy Latch as supplied by Centrewire Ltd.
- 6 All metal fittings and screws to be heavily galvanised to BS729.
7. Gates to open as detailed on drawings.
8. Field gates to comply with BS3470.
9. Gates to be sited on level ground.
10. If required, stone landing to be provided 3.5m either side of gate.

DESCRIPTION OF TIMBER MATERIALS

SIZE (mm)

Hanging post	200 x 200 x 2100 long
Shutting post	175 x 175 x 2100 long
Hanging stile	100 x 75 (3m gate) 125 x 75 (3.6m gate)
Shutting stile	75 x 75
Top rail	100 x 75 (3m gate) 125 x 75 (3.6m gate) Both tapering to 75 x 75
Under rails	75 x 25
Braces housed in top rail	75 x 75



NOTES

1. For dimensions and description of timber materials and details of fittings for hanging see Timber Field Gate and Bridle Gate details (F5 and F6).
2. Double gates may consist of any combination of gates e.g. two field gates, two bridle gates or one of each.
3. Drop bolts and catches shall be galvanised to comply with BS729. (see F11)



**Pennine Bridleway
National Trail**

TIMBER DOUBLE GATE

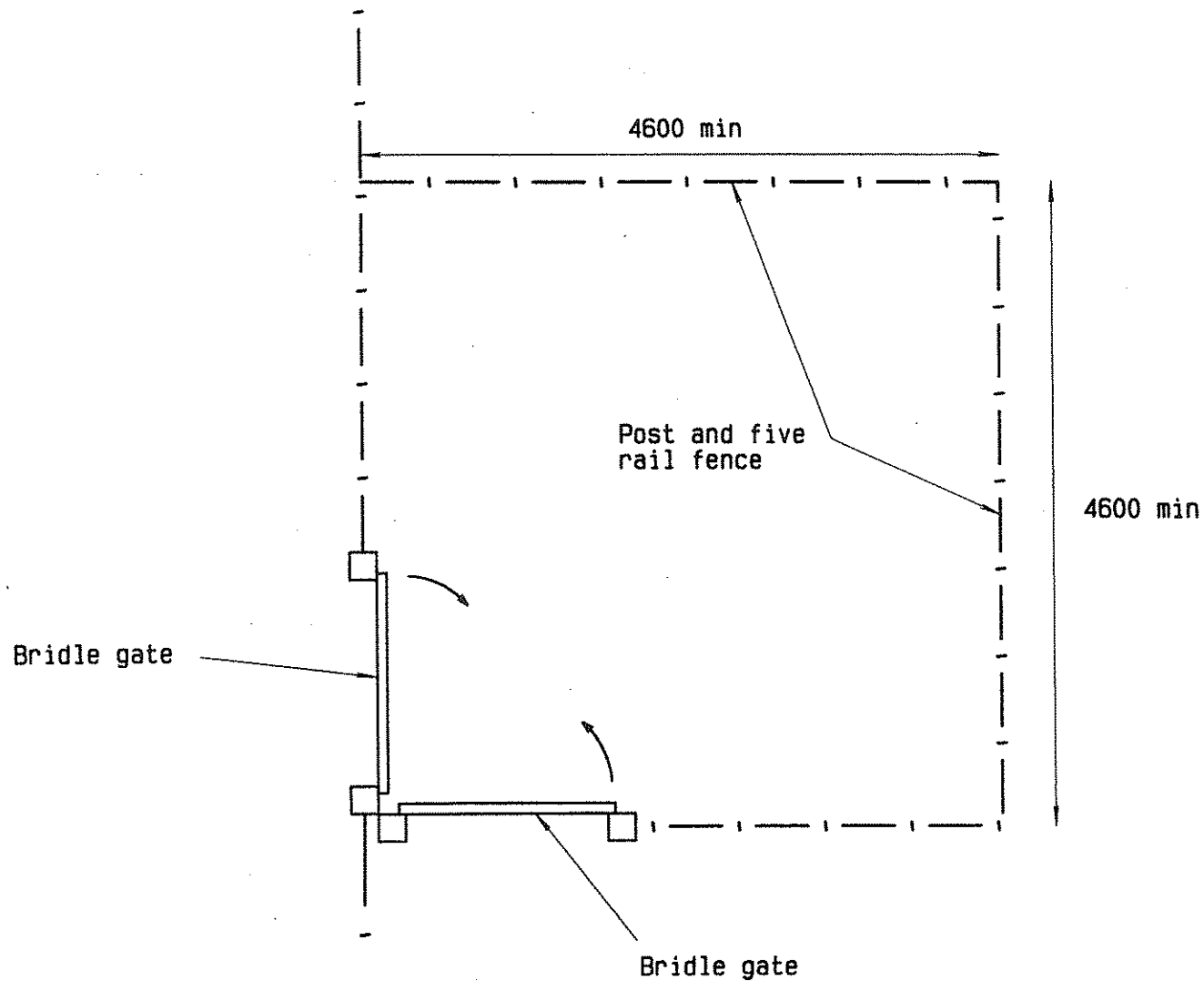
Source: Lancashire County Council

Issue	Date

Drawing No.

F8

Sheet 1 of 1



**Pennine Bridleway
National Trail**

DOUBLE STOCK PROOF BOX GATES WITH OPTIONAL PEN

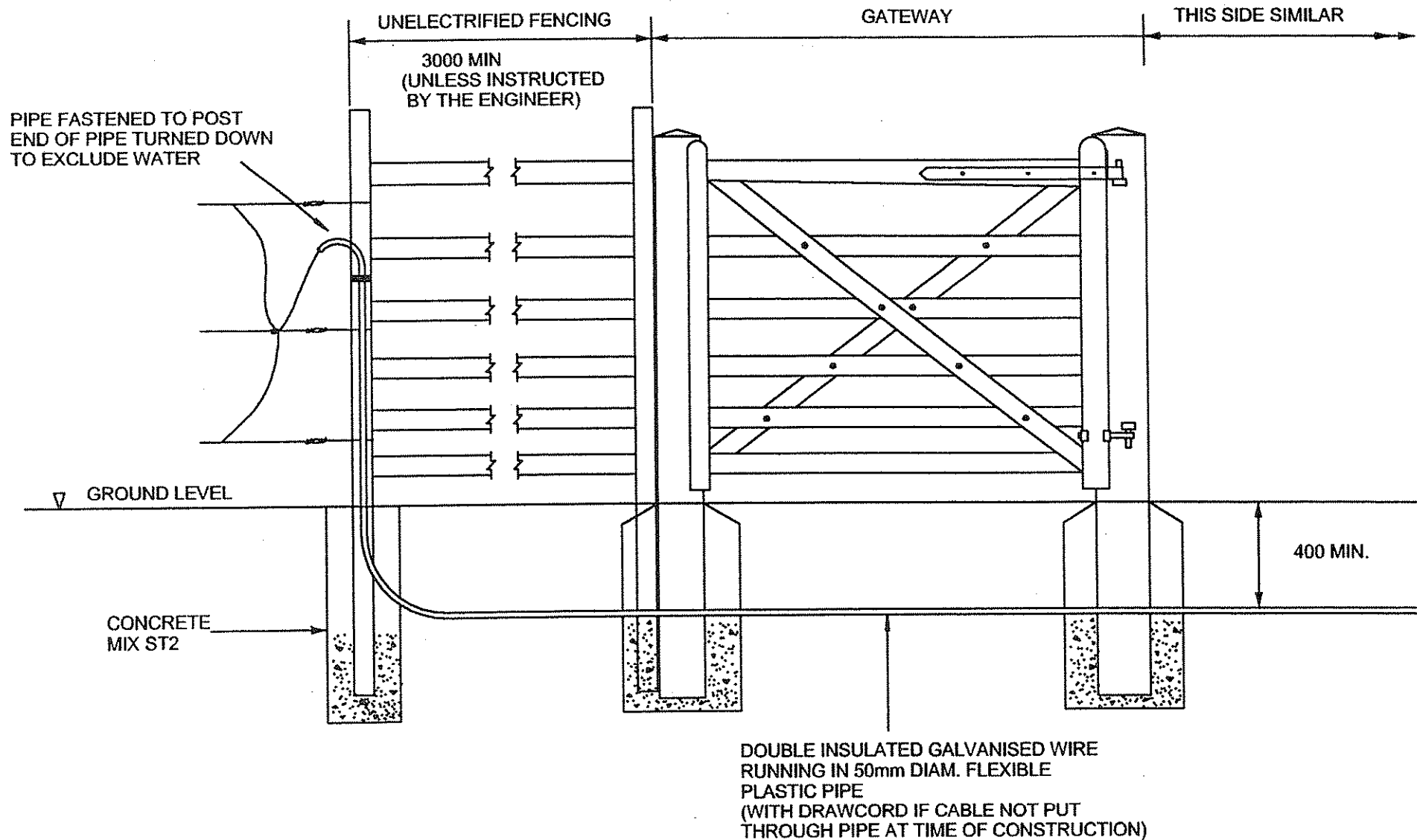
Source: Lancashire County Council

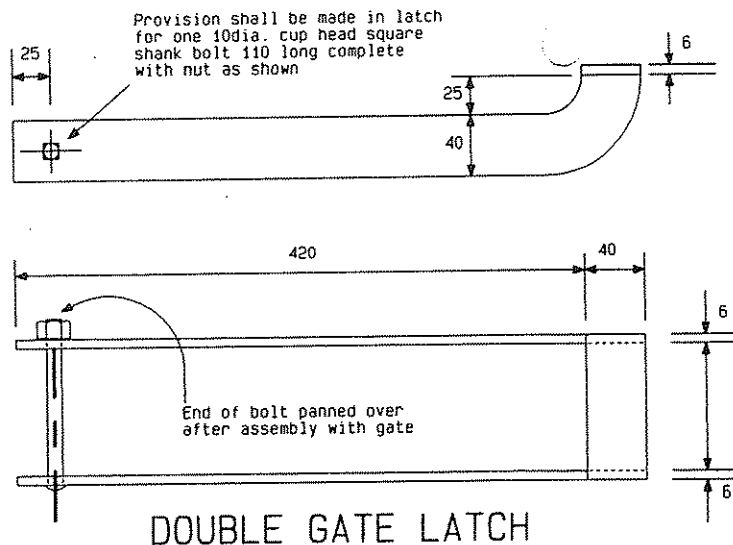
Issue	Date

Drawing No.

F9

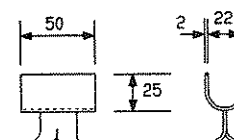
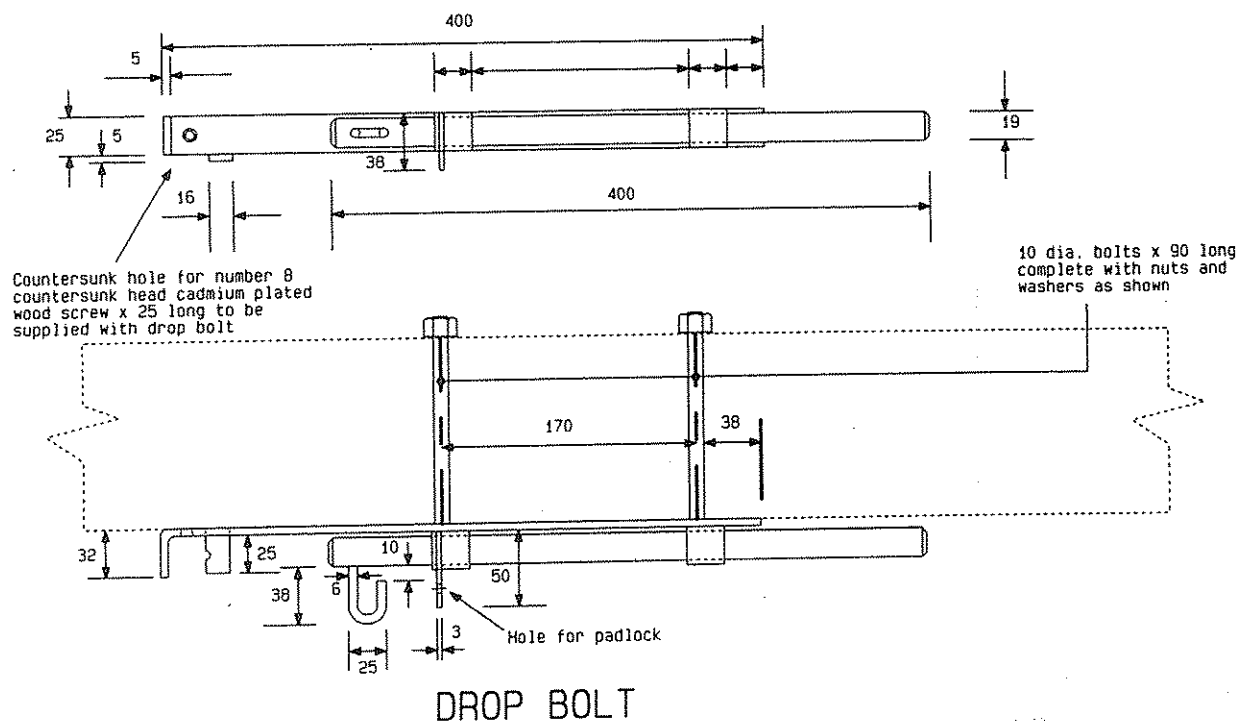
Sheet 1 of 1





NOTES

1. All dimensions in millimetres unless otherwise stated.
2. Gate fittings shall comply with BS 3470 or BS 5709 as appropriate
3. All metal fittings and bolts shall be galvanised mild steel



BOLT SOCKET



**Pennine Bridleway
National Trail**

**LATCH AND DROP BOLT FOR
TIMBER DOUBLE FIELD GATE**

Source: DoE MCD Highway Const. Detail H32

		Drawing No.
		F11
Issue	Date	Sheet 1 of 1

Typical fence adjacent



150mm x 75mm x 1950 mm posts

125mm x 150mm
Timber baulk
(Tanalised)

4 No. 150mm nails

*100B = needs
correcting*

375max

*Should only be a
minimal gap*

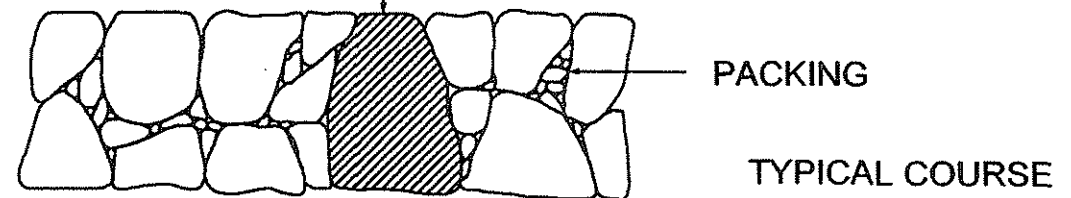
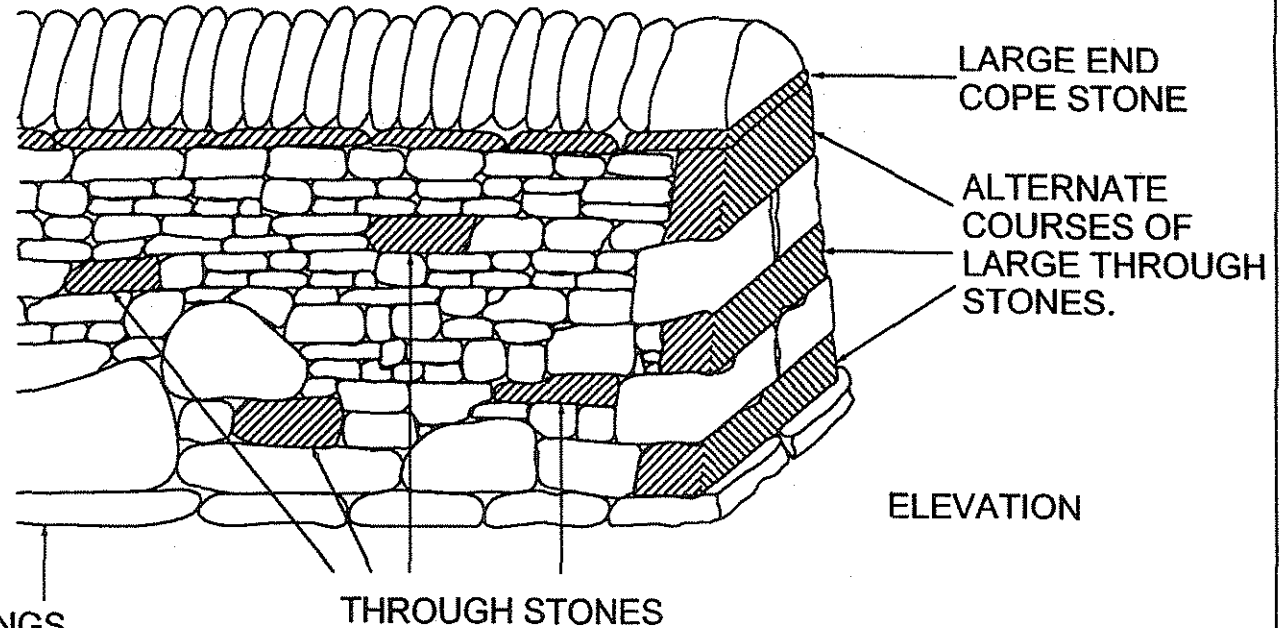
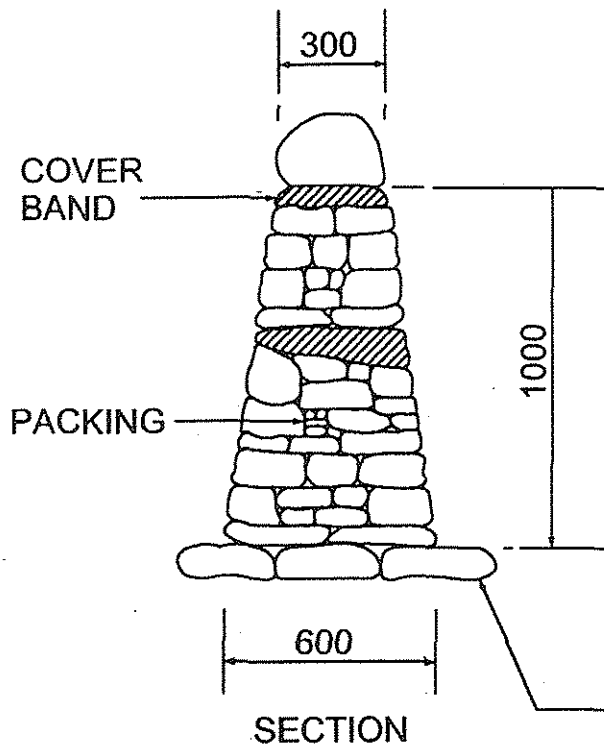
450

Concrete
class ST2

525mm max
125mm x 150mm
Timber baulk
(tanalised)

Notes

1. All timber to be of approved type and in accordance with the Specification.
2. 150 mm nails skew driven to attach timber baulk to post and uprights.
3. If the stile is to be placed on a slope then height of step should be a maximum of 300mm.
4. The landings either side of the stile should be stoned wherever possible to prevent puddles forming. Stoned landings to extend 2m from stile.



NOTES

1. GENERALLY LARGER STONES SHALL BE USED AT THE BASE AND END OF THE WALL AND SMALLER STONES AT THE TOP
2. THE LONGEST DIMENSION OF EACH STONE SHOULD RUN INTO THE WALL
3. STONES SHALL BE GENERALLY LAID IN RANDOM COURSES.
4. THERE SHALL BE AT LEAST TWO THROUGH STONES IN EACH RUNNING METRE.
5. PACKING STONES SHALL BE USED TO FILL ALL INTERNAL CAVITIES.
6. WALLING CONTRACTS MUST ONLY BE GIVEN TO APPROVED CONTRACTOR WITH THE NECESSARY SKILLS TO MEET THE STANDARDS OF THE D.S.W.A.(DRY STONE WALLING ASSOCIATION)



**Pennine Bridleway
National Trail**

DRY STONE WALL

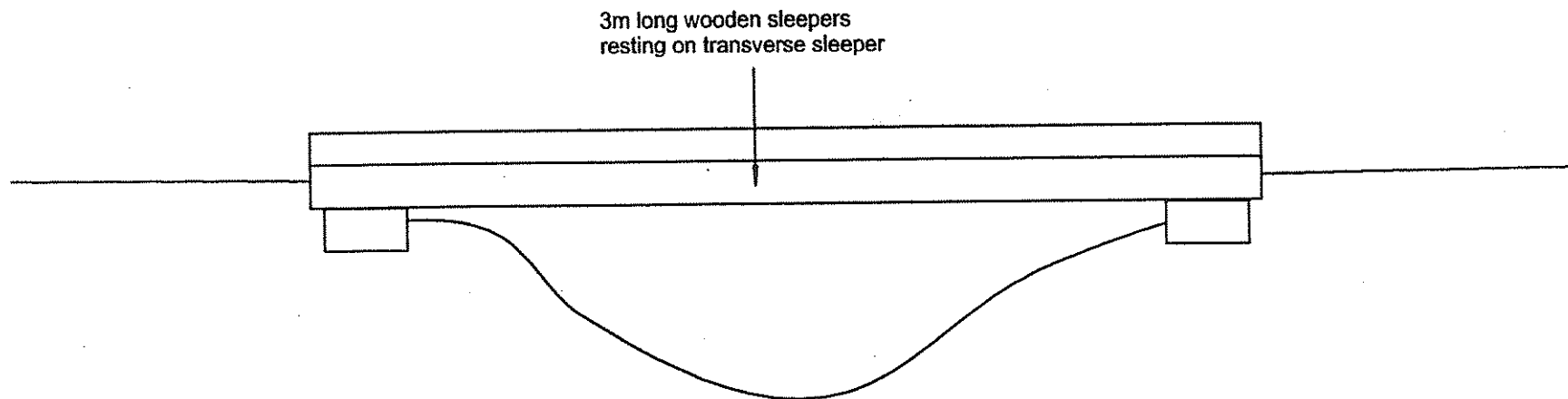
Source: Tameside MBC

Issue	Date

Drawing No.

F13

Sheet 1 of 1



3m long wooden sleepers
resting on transverse sleeper

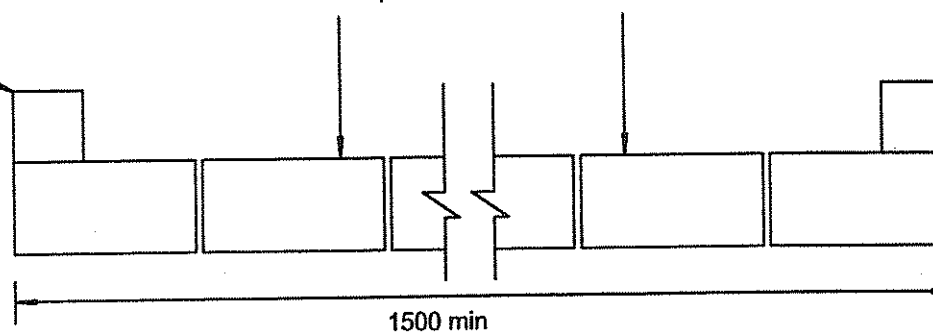
ELEVATION

100x100 wooden edge board
to prevent horse/person
slipping off side

Surface of sleepers to be coated with
epoxy resin and bauxite grit to provide
non-slip surface

NOTES

1. Maximum gap between individual sleepers to be 10mm
2. 1.2m high parapet required where drop greater than 1.0m



CROSS SECTION



**Pennine Bridleway
National Trail**

SLEEPER BRIDGE

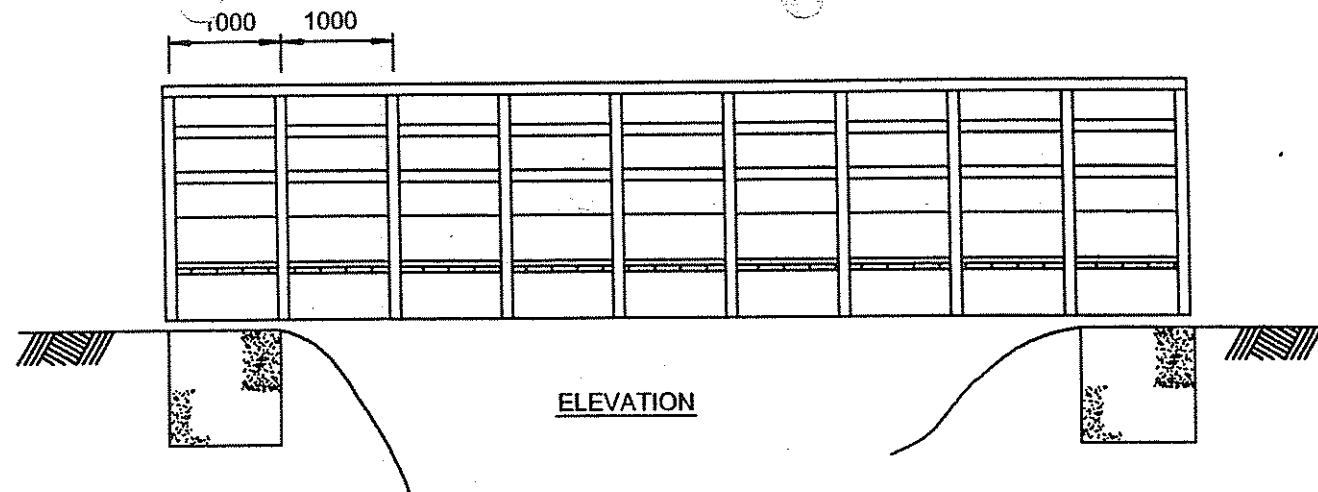
Source: Lancashire County Council

Issue	Date

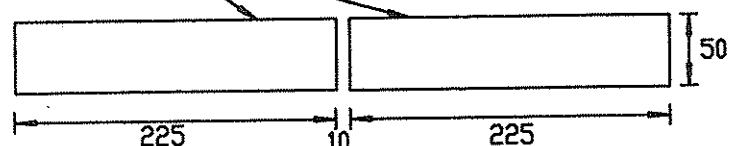
Drawing No.

B1

Sheet 1 of 1

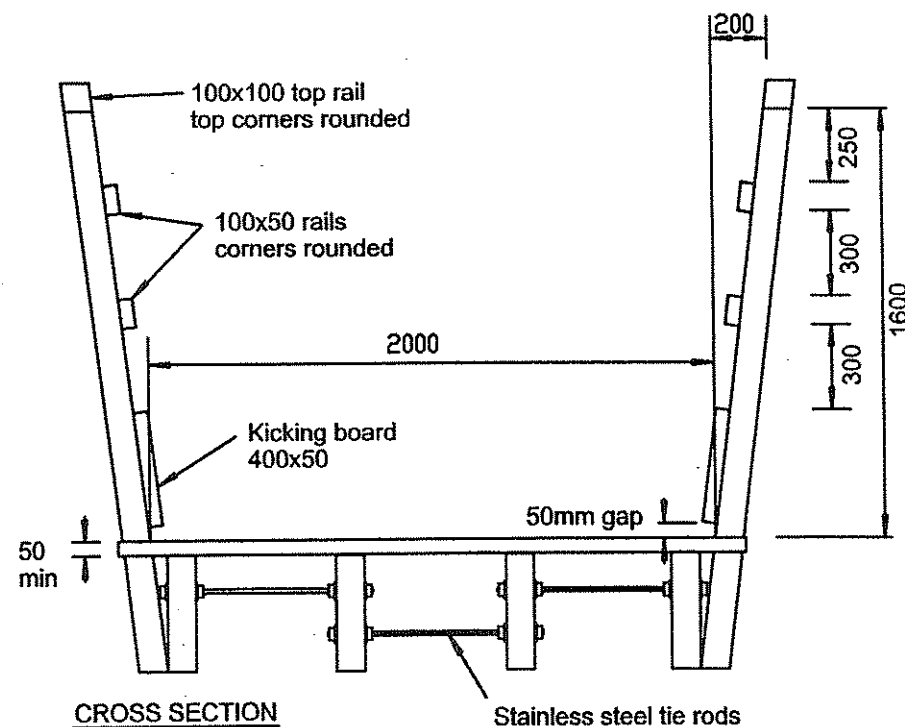


Surface coated with epoxy resin
and bauxite grit to give non-slip
surface



NOTES

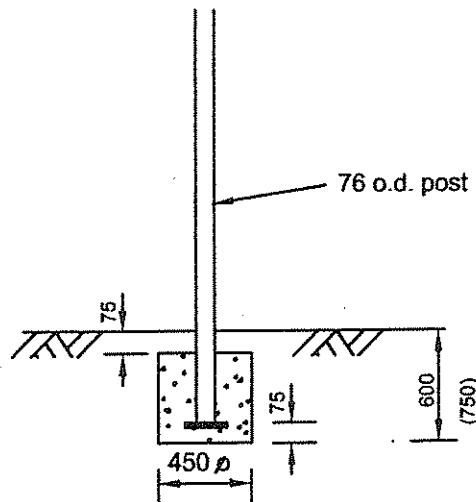
1. All dimensions in millimetres.
2. Hardwood timber to be used throughout.
3. Dimensions and number of main beams to be designed to suit span.
4. Positions and dimensions of bridge foundations to be designed for actual ground conditions.



NOTE: TO BE LOCATED ON SITE

NOTE :

1. All dimensions are in millimetres
2. Concrete in foundations to be Class ST2
3. Posts shall not protrude above the top of the sign



POST FOUNDATION DETAIL



900
or
750

2200

NOT TO SCALE

SIGN ASSEMBLY

Diag 550.1

X HEIGHT	
MAT. CLASS	1
APP. AREA	
DIAG No.	550.1

POSTS	
Nr.	SIZE x (WALL THICKNESS)
1	76 o.d. x 3mm
	114 o.d. x 5mm
	160 x 80 RHS x 5mm

LIGHT UNITS		
Nr.	SIZE	PEC
	twin 8w s/s	
	twin 8w e/e	
	twin 18w s/s	

EXTRAS	
ESB	
SBH	
76 o.d. STUB POST	

NOTES	

 **Pennine Bridleway
National Trail**

HORSE WARNING SIGN

Source: Lancashire County Council

		Drawing No. S1
Issue	Date	Sheet 1 of 1

Pennine Bridleway National Trail

Improvements and repairs to this
bridleway will be taking place
over the next 10 - 14 days.

Every effort will be made to keep
disturbance to a minimum.

If you would like to know more
about this work please contact the
Engineer's Representative on
01772 263703.

If you would like to know more
about the Pennine Bridleway
please contact the Pennine
Bridleway Team on
0161 2371061.

We apologise for any inconvenience.

Thank you

Countryside
Agency
Logo

Local
Authority
Logo

Sport
England
Logo

NOTES

1. This is an example of the information
which should be put onto the Site Information
Board with necessary amendments to suit
each individual scheme.
2. Boards should consist of A4 sized sheet
in plastic laminate or a suitable
weatherproof plastic cover.
3. Boards should be attached to fences,
posts or other suitable objects at either
end of the works in a highly visible
location adjacent to the bridleway.
4. Notices should be removed on completion
of the works.



**Pennine Bridleway
National Trail**

 **Pennine Bridleway
National Trail**

LOGOS

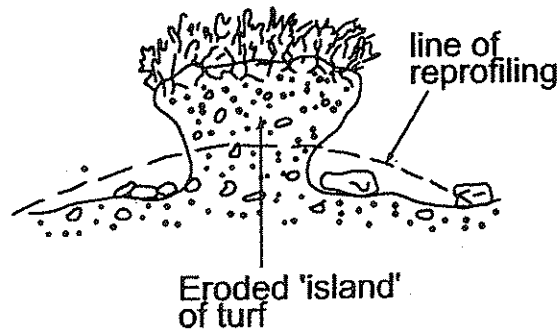
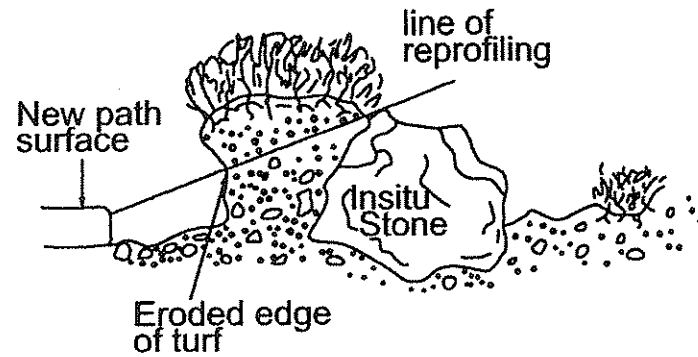
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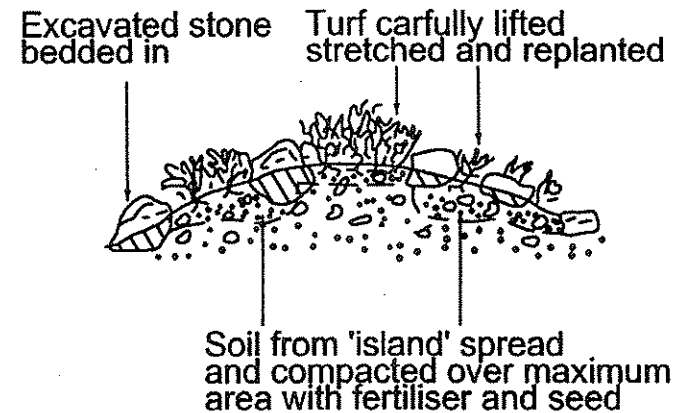
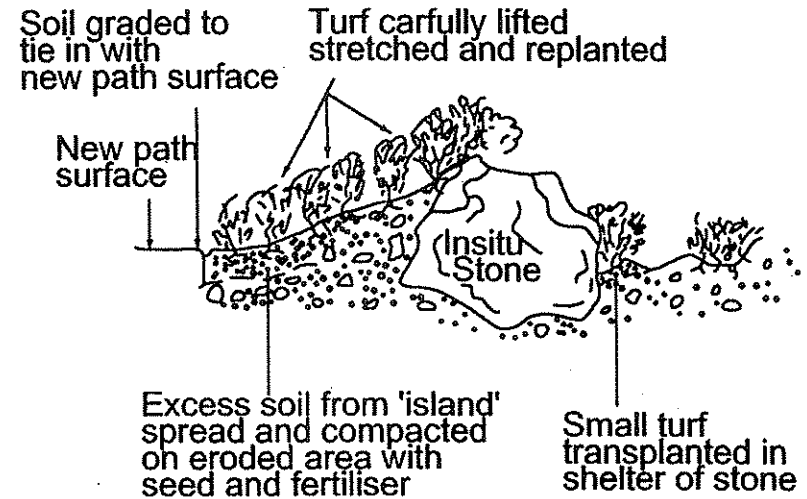
Drawing No.
S3
Sheet of

REPROFILING ISLANDS OF ERODED TURF.

BEFORE



AFTER



**Pennine Bridleway
National Trail**

REVEGETATION AND LANDSCAPING

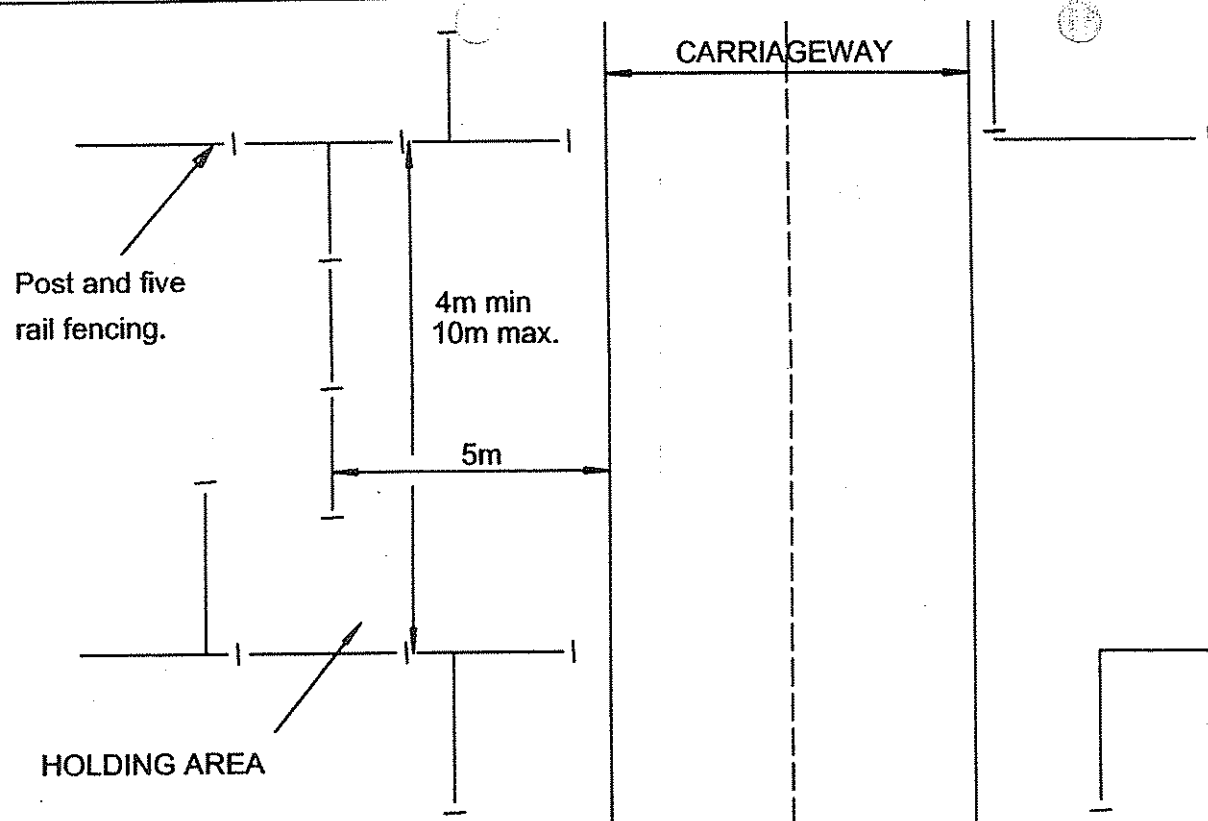
Source: Cleveland Way National Trail.

Issue	Date

Drawing No.

M1

Sheet 1 of 1



NOTES

1. Holding area should be fully grassed and free draining.
2. Rectangular shape with squared corners to avoid confusion with laybys.
3. Consult Advice Note TA 57/87 for 'over the top' visibility standards required from the front half of the holding area.
4. Width related to expected usage (4m min - 10m max).
5. Wood chippings may be used if area gets excessively muddy.
6. All carriageway crossings must comply with the Department of Transport Highways and Traffic Departmental Advice Note TA 57/87.



**Pennine Bridleway
National Trail**

HOLDING AREA

SOURCE: DoT DMRB, ADVICE NOTE: TA57/87

Issue	Date

Drawing No.

M2

Sheet 1 of 1

600 clear knee
room under
table

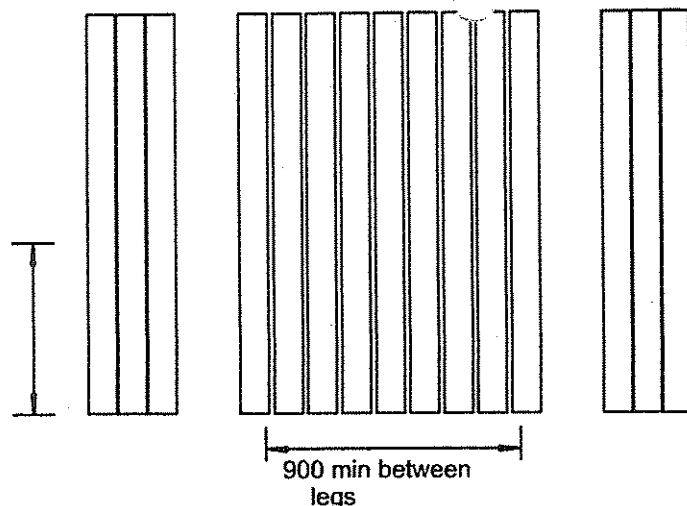
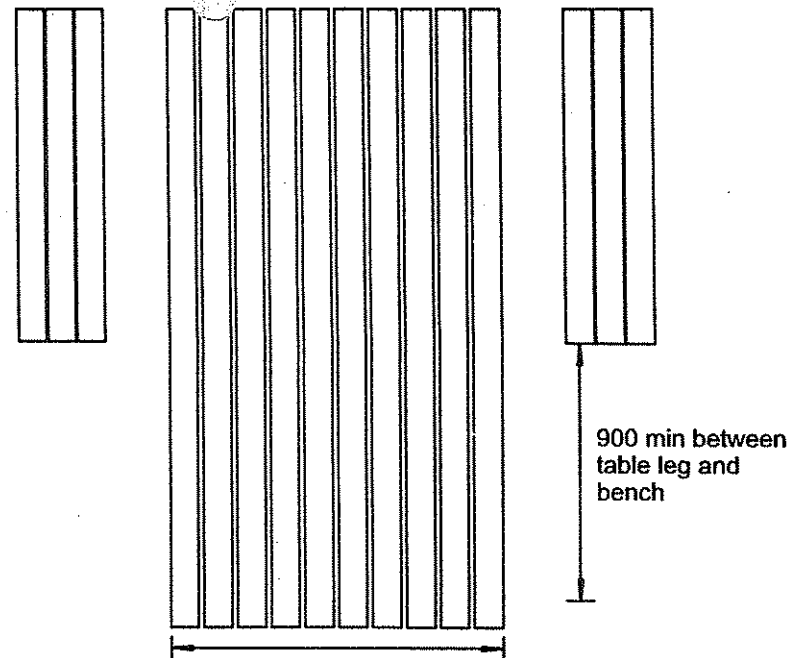


TABLE WITH WHEELCHAIR ACCESS FROM EITHER END

GENERAL PRINCIPLES

1. Table clearance should be 750mm high so wheelchair arm rests slide underneath. Benches should be 450-520mm high.
2. A clear width of 900mm per person should be provided for access to the tables. A depth of 600mm knee space is also required.
3. Allow clear access of 1500mm around tables to allow for wheelchair manoeuvrability.
4. Many ambulant disabled people cannot sit at a table unless they can slide along the seat. Avoid tables that require people to climb over beams.
5. Accessible picnic tables should be located on level sites by accessible paths.



1200 min to allow wheel chair
users to sit facing each other

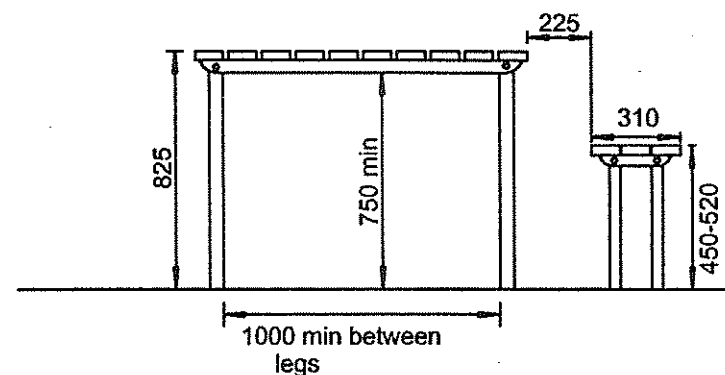


TABLE WITH WHEELCHAIR ACCESS FROM EITHER SIDE

NOTE: All dimensions in millimetres



**Pennine Bridleway
National Trail**

PICNIC TABLES

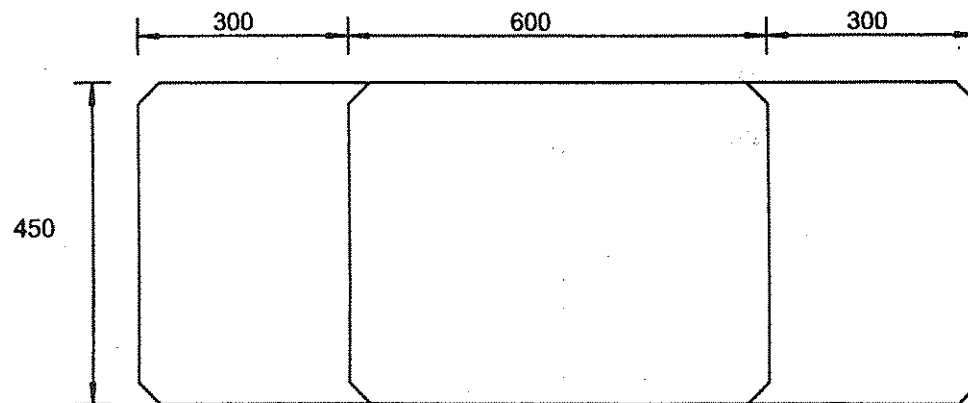
Source: BT Countryside For All

Issue	Date

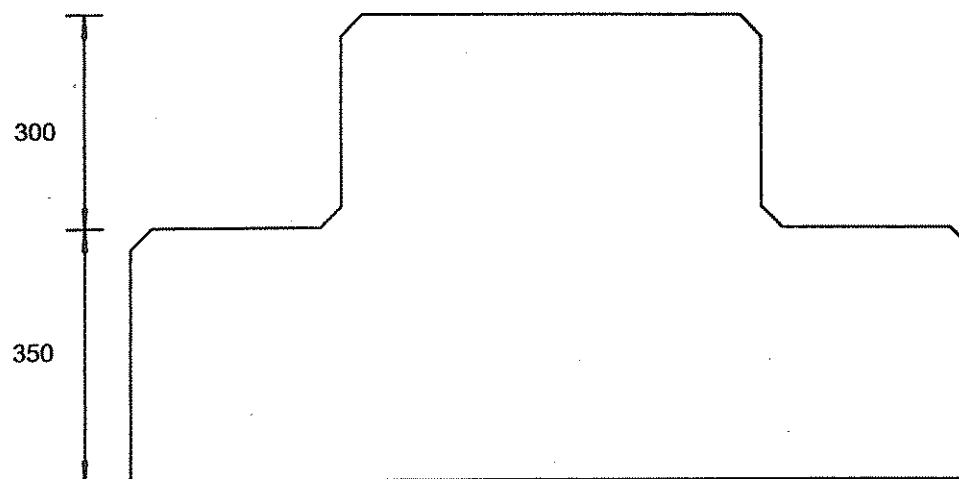
Drawing No.

M3

Sheet 1 of 1



PLAN



ELEVATION

NOTE

1. All corners to be rounded / chamfered.
2. Concrete, if used, should be suitably coloured or painted.
3. Top surfaces to be textured or provided with a non-slip surface.

All dimensions in millimetres



**Pennine Bridleway
National Trail**

MOUNTING BLOCK

Source: Lancashire County Council

Issue	Date

Drawing No.

M4

Sheet 1 of 1

Post and two
rail fence

B

100 square
posts

CONSTRUCTION OPTIONS

1. Stone walls with 6F1 infill and surface.
2. Stone walls with 6F1 infill and textured concrete surface.
3. Mass concrete with stone cladding and textured concrete surface.

A

Flat platform

Ramp

A

100 x 50 top rail
chamfered edges

90 x 40 mid
rail

100 x 50 edge
board

900

700

1800

SECTION B-B

B

100 x 50 edge
board

PLAN

1800

5400

SECTION A-A



**Pennine Bridleway
National Trail**

MOUNTING RAMP FOR DISABLED RIDERS

Source: Lancashire County Council

Issue	Date

Drawing No.

M5

Sheet 1 of 1

SEED AND FERTILISER (Option 1)

1. The fertiliser shall be a slow release NPK + Mg fertiliser consisting of:

5% N
18% P
10% K
5% Mg

The rate of application shall be 70g/sqm.

2. The seed mixture shall be as follows:

25% Surf Perennial Rye Grass
20% Symphony Slender Creeping Red Fescue
15% Sunset Strong Creeping Red fescue
10% Sheeps Fescue
10% Valda Hard Fescue
10% Bingo Chewing Fescue
5% Fine Sheeps Fescue
5% Highland Browntop

The rate of application shall be 35g/sqm.



**Pennine Bridleway
National Trail**

SEED AND FERTILISER DETAILS

Source: Pennine Way National Trail

		Drawing No. M6 Sheet 1 of 2
Issue	Date	

SEED AND FERTILISER (Option 2)

1. The fertiliser shall consist of Npk in the following proportions:

15% N

55% P

30% K

The rate of application shall be 35/sqm.

2. The seed mixture shall be as follows:

40% Dancer Perennial Rye Grass

20% Eureka Hard/Sheeps Fescue

19.5% Tamara Chewings Fescue

10% Quatro Sheeps Fescue

7.5% Highland Browntop Bent

1.5% Emerald Creeping Bent

1.5% Tufted Hair Grass

The rate of application shall be 35g/sqm.

Facsimile Transmission



Peak District National Park Authority, Aldern House, Baslow Road, Bakewell, Derbyshire. DE45 1AE. Tel. (01629) 816200 Fax. (01629) 816310
Ranger Service - HQ Tel. (01629) 815185 Fax (01629) 815045. Ranger Service - West & Central Region Tel./ Fax. (01298) 871888

To: D.C.C. R.O.W.	Your reference:
For attention of: Dave Jenkinson.	Our reference: C.M.T. wicket gate.
Fax number: 01629 585143	From: Pam Pickering
Total number of pages (including this one): 5.	Date: 8.3.01

PLEASE TELEPHONE IN CASE OF INCOMPLETE RECEIPT

Dave.

As requested to follow is one wicket gate
specification + installation details.

These details are for training novices so
forgive any nuances if these are to be
passed on to the initiated.

Thanks.

Pam.

C.M.T. Supervisor
Ranger Service

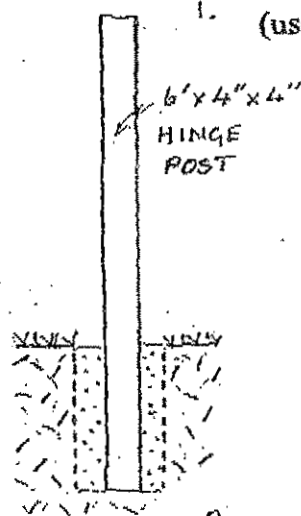
National Park officer: Christopher Harrison
ANPO Head of Planning: John Anfield, ANPO Head of Conservation: Ken Parker, ANPO Head of Recreation: John Thompson,
ANPO Secretary & Solicitor: Kevin Francis

MATERIALS: Wicket gate, top and bottom hinges (with screws), gate hook and staple with screws, gate spring with securing bolts, pair of gate posts, pair of fence posts and rail to suit, way-mark discs and information plaques to suit, nails (3").

TOOLS: Digging tools, drill and bits (to suit screws and bolts), screw drivers, punner, spanner, hammer, spirit level, steel tape, 'Surform'.

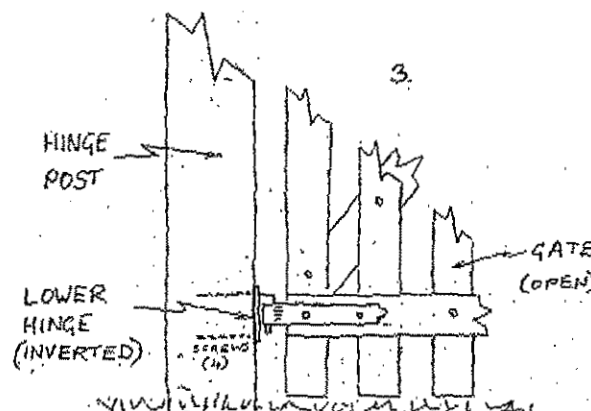
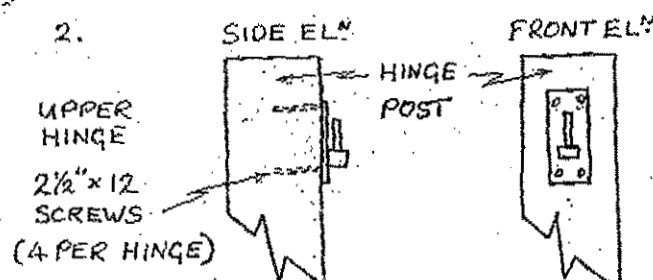
Stage 1. Erect hanging post with sides square to associated field boundary. Ensure post is firm and upright (use spirit level). Ensure sufficient room for the gate.

Stage 2. Attach top hinge in an upright position to the outer face of the hinge post (use 4 screws).



Ensure that hinge plate is vertical and has enough height to enable the gate to open freely with the basal gap small enough to be lamb-proof (50-100mm).

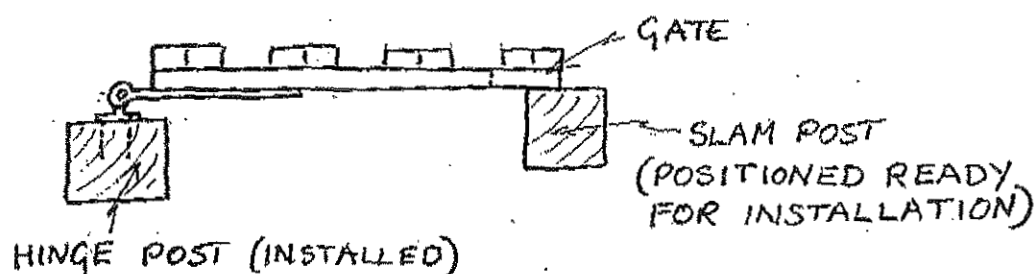
Stage 3. The gate (with attached metal hinge-straps) is lowered onto the top hinge and is propped or held upright (with its vertical rails parallel to the hinge post). The lower hinge is then inverted (so that it points down - this is to prevent the gate being easily removed!), placed through the lower hinge cylinder, centred, drilled and screwed into place.



Stage 4. With the gate in the closed position, locate the 'slam' post so that the gate will squarely 'clap' against it. Bear in mind that a securing hook must be added: about half way along the face of the post is usually adequate.

4.

THE GATE IN PLAN



This also ensures that any barbed-wire is kept away from the gate area.

Finally, tidy the site, remove all surplus materials and tools. Clean and load the later ready for the next job.

IMPORTANT

HEALTH AND SAFETY. You will be working on a right-of-way which may be used at any time by members of the public. Watch out for other path users, advise them of the situation, remove tools from the path, point out the location of open excavations. Take a first aid kit of appropriate size and know where the nearest qualified first-aider is!

Check the site in advance if there is any likelihood of there being service pipes or cables in the vicinity. **WHEN IN DOUBT - DON'T DIG!** There are machines available to detect underground services - make sure you check!

ON FARM LAND. If you have to leave the site for more than a few minutes, make sure that any livestock present on either side of the gateway cannot stray. Take and use a length of portable fencing (or a hurdle) if this is likely to occur. Remember also that you may be observed by the land owner or tenant - act accordingly - you are Peak Park employees.

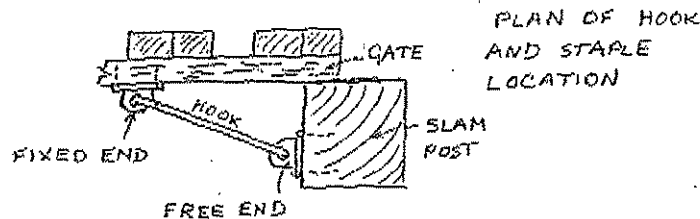
CEMENT. Only use cement or concrete if digging your post-hole to the required depth (c.30-36 inches) is not possible - due to bed-rock for example.

post position on the ground and, as with the gate, and with its outer face parallel to the gate cross-bars.

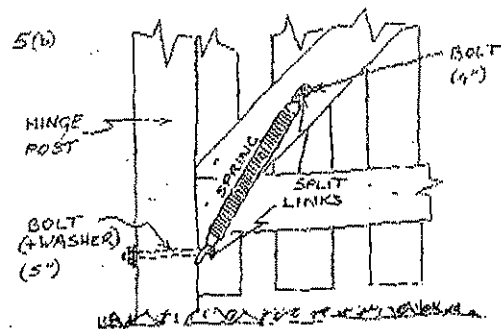
Stage 5. Additional 'furniture' may now be added.

- (a) Hook and staple - each secured by four screws. The hook must be accessible from both sides of the gate and must be as solid as possible - i.e. with the hook plate on the face of the gate's top rail and the staple on the inner face of the slam post.

5(a)

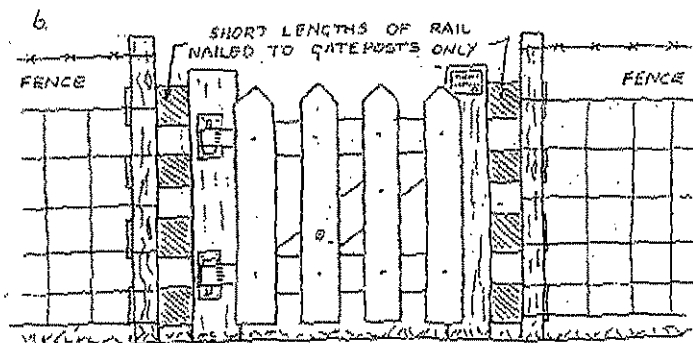


- (b) Gate closure spring. This is a difficult device to fit perfectly. Basically, one end is bolted to and through the hinge post and the other to a solid part of the gate (where a vertical rail crosses the diagonal rail). With the gate closed, the spring should be under a small amount of tension - so that it closes completely when released. In practice a split chain link is attached to both ends of the spring. This is attached to the woodwork by a pair of round-headed bolts: - Don't forget to put washers under the nuts. Tighten both nuts with an adjustable spanner.



- (c) Add gate messages (way-mark discs, 'close the gate' and other signs) as required. Make sure they are visible and secure.

Stage 6. Associated fencing. Tensioned wire attached to either gate post may pull either or both of them apart; therefore always secure such fencing to separate fence posts close to (but not attached to) the gate posts. Fill any gap between fence and gate posts with sufficient rail to ensure adequate stock-proofing (say, four lengths on each side) and nail to the flat surfaces of the gate posts only: -



This also ensures that any barbed-wire is kept away from the gate area.

Finally, tidy the site, remove all surplus materials and tools. Clean and load the later ready for the next job.

IMPORTANT

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