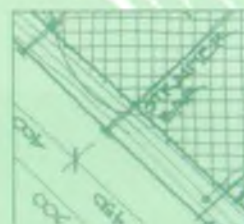


The National Rivers Authority  
**RECREATION FACILITY DESIGN MANUAL**



**NRA**

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ENVIRONMENT AGENCY



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## PART A

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### USER GUIDE

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NRA

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## PART A: USER GUIDE

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### 1. INTRODUCTION

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#### NRA Duties:

The NRA has a duty to take account of recreation in the performance of all its functions and specifically:

- the preservation and maintenance of access for the public to places of natural beauty and to buildings, sites and other objects of archeological, architectural or historic interest;
- to ensure that water and land under the NRA's control is made available for recreational purposes and that in doing so the needs of persons who are chronically sick or disabled are taken into account

In addition the NRA has a duty, generally, to promote the use of inland and coastal waters, and land associated with them for the purpose of recreation to the extent that it deems desirable. The Code of Practice on Conservation, Access and Recreation, issued by the Secretary of State gives practical guidance to the NRA on fulfilling these duties. The NRA's principal aim in relation to recreation is outlined in the National Recreation Strategy and is to:

- develop the amenity and recreational potential of inland and coastal waters and associated lands

this is to be achieved through three specific objectives:

- to maintain, develop and improve recreational use of NRA sites
- to take account of recreation in any proposals relating to any NRA function
- to promote the use of water and associated land for recreation purposes

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#### Purpose of the Manual:

The aim of this manual is to provide general guidance for NRA staff with recreation responsibilities on the provision of recreation facilities. The manual is not intended to be exhaustive and the range of basic designs given are intended to stimulate the imagination rather than stifle it. In many cases local variations in materials and therefore alterations to the design will be required. It should assist staff in developing NRA sites, contributing to collaborative projects and providing advice to the general public.

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## PART A: USER GUIDE

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### 2. SCOPE

Specialist items such as buildings and bridge design as well as bank stabilisation techniques have not been included as they require more specialist expertise. Soft landscaping works have also been excluded, as to provide any meaningful advice would require another manual in itself! In both cases it is essential to seek expert guidance. The manual is intended therefore, to focus principally upon the numerous small schemes that can be organised and carried out by NRA staff with recreation responsibilities. An attempt has been made to avoid technical terms. Any that have been used are included in the glossary in Part C. The Manual itself is divided into three parts:

Part A – The User Guide

Part B – Recommended Details

Part C – Reference Information



## PART A: USER GUIDE

### 3. SELECTING DETAILS

Before you start to select details and designs which you think may be suitable for a site there are a number of factors to consider which include: a management plan, site assessment and visitor requirements.

#### 3.1 MANAGEMENT PLANS

Any work carried out on a site should meet the objectives of a management plan. A management plan is a specific document prepared by the controlling owner, occupier or manager of a piece of land and which guides the planning and management of that land. They serve the following purposes:

- the provision of a well-researched and comprehensive reference record
- the formulation of explicit objectives and priorities for management decisions
- the identification of additional resources required and options for change
- an assurance for continuity of management within the guidance of the plan and programme of work

You should not start work on the site before a plan has been written. Even if the site is very small and you decide that a management plan is not needed you will still need to go through a similar process as part of your decision making and this will include at the very least an assessment of the site and the visitor requirements.

#### 3.2 SITE ASSESSMENT

An assessment is carried out in order to ensure that the facilities introduced are sensitive to the physical, biological, social and historical aspects of the site. Listed are some of the most important things to consider:

- a) **THE STATUS OF THE SITE** – does it have any designation for example, is it a Site of Special Scientific Interest, a Scheduled Ancient Monument or is there a Tree Preservation Order in force?

- b) **OPERATIONAL USES OF THE SITE** – do Flood Defence or Water Quality for example, require regular access to or across the site?
- c) **EXISTING USE** – Will your designs affect any of the existing users of the site, will fencing for example, prevent local people from taking a short cut.

NRA methodologies such as Site Management Plans, River Corridor Survey, River Landscape Assessment and River Habitat Survey should be used when looking at larger and more complicated sites.

The provision of any facility is likely to have a visual impact and it is possible to use the facility to do one of three things:

- reinforce existing site character
- seek to change the character
- have minimum impact

Site character can be influenced by a variety of features, for example:

- topography
- visibility
- extent and type of tree cover
- presence of water features
- historical and cultural associations
- special features or buildings
- local vernacular, expressed by type of path surface, gates, stiles, walls
- condition of landscape, from derelict to manicured

Looking at these points in turn it can be determined whether a site's character is positive, negative or neutral and consequently the approach to be adopted. Seeking to change a site's character demands particular care and if in doubt go for minimum impact.

It is important when assessing a site to liaise fully with other functions who may have an interest in the site. This may include not just operational requirements but also consents. Fencing or tree planting within the byelaw width of a river may require land drainage consent and you will need the agreement of the Flood Defence Function before you can go ahead.

## PART A: USER GUIDE

### 3. SELECTING DETAILS

#### 3.3 VISITOR REQUIREMENTS

In parallel to the site assessment it is essential that the requirements of future visitors are established before designs are selected. In order to do this it may be useful to draw up a visitor profile of these future visitors taking into account:

**WHOM** – age, gender, family groups

**WHEN** – time, weekday, weekend, month

**HOW OFTEN** – every lunchtime, once a week

**DURATION** – time on site, a lunch hour, afternoon

**SEASONAL VARIATIONS** – summer visitors, bank holidays

**SPECIAL NEEDS** – school groups, elderly, infirm, disabled

A simple example might be the provision of an interpretative board for a small wetland area.

**WHOM**, would be vitally important in order to determine the board's audience. This might range from primary children on organised school trips to specialist adult groups. Content, layout, level of detail, both textural and illustrative, mounting type and height will all vary dependent on the anticipated visitor profile. Numbers of visitors will also be important to assess likely levels of use or abuse and the consequent size and sturdiness of construction.

**WHEN**, is also important. If most visits are made in the summer, whether through choice or access control, a board illustrating wintering birds would be inappropriate. Other seasonal variations will help determine the need for access to the board or hard surfacing around it. Predominantly winter usage will significantly increase wear, whilst summer usage may require vegetation control. Time of visits may be critical if these are at dawn or dusk. The spread of visits over the week will also make a difference, low visitor number concentrated into narrow time bands may require more space around the board or a larger board to avoid overcrowding.

**HOW OFTEN**, represents the factor of familiarity. This is more critical to signage where a high number of repeat visits may significantly reduce the need for waymarking.

**DURATION**, on site will, with visitor numbers, allow calculation of the average number of visitors on site at various times and seasons. This is particularly important when deciding parking and path capacities. It is also useful in assessing the likely impact on the physical resource. Access control may be required if the impacts are unacceptable.

**SPECIAL NEEDS**, of various groups should also be identified so that a reasonable level of provision can be made. Groups with disabilities or young children might arrive by minibus for instance and require special set down areas, path surfacing and widths and interpretation boards may need to be set lower. Common sense and a reasonable level of provision should be the guide.

The provision of the initial facility may have knock on effects that are not recognised at the time. For example, the popularity of the interpretation boards might lead to a demand for guided walks, trails, informal seating, additional paths and planting. The need for these additional facilities should be anticipated as far as possible to ensure design continuity, compliance with available budgets and the protection of the physical and biological resource.

**ONE OF THE BEST WAYS OF ASSESSING VISITOR NEEDS IS BY ASKING THEM!**

#### 3.4 OBJECTIVES

Points arising from the analysis of both the visitor requirements and the site assessment should now be brought together to form a prioritised list of objectives for the facility in relation to the site. This should be consistent with any objectives set out by the management plan for the site, where there is one. As well as the site assessment and visitor requirements the objectives will be influenced by existing budgets, construction season, NRA consent requirements and other legal obligations.

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## PART A: USER GUIDE

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### 3. SELECTING DETAILS

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#### 3.5 SELECTION 1

Part B provides details on facilities which have been chosen from a wide range of options as being particularly suitable for the scope of the manual. Their suitability is not, however universal to all users and site requirements. Careful selection is required to ensure that the identified objectives are met.

To assist in this selection each facility has been scored for Capital Cost, Ease of Installation, Durability, Maintenance Implications, Sustainability and Access for all. In addition the recommended context of the details have also been given ie. rural/semi-rural/urban. In normal circumstances such contextual guidance takes precedence over all other criteria and there should be exceptional reasons for facilities being used outside their suggested context. For ease of quick visual reference scoring is on a simple high/medium/low or good/medium/poor rating. Because the relative value of each criteria will be variously influenced by project specifics it has been left to the NRA staff to decide on the relative weighting attached to these criteria.

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#### 3.6 SELECTION 2

A two-step process is suggested, consisting of:

1. Discarding facilities which fail to meet the objectives.
2. Positive selection from the remaining choice with the facility which achieves best fit with the stated objectives.

If no facility appears to fit your objectives, revisit them to see if they are too demanding, adjust them and rerun the exercise.

If selection is being made on a number of facilities for one site care should be taken that they project a similar image and level of provision or finish. The detail sheets in part B of the manual contain cross-references to other compatible designs.

## PART A: USER GUIDE

### 4. CONSULTATION

Before reaching this stage you should have already carried out some form of consultation with at least:

- The present users of the site
- Potential future visitors
- Other NRA Functions

Once you have selected your designs you may need to carry out another round of consultation/liaison to:

- Obtain planning permission if this is needed, especially where access from the public highway is involved or where buildings, structures or tree felling is proposed
- Obtain agreement to the designs from other NRA Functions who may have an interest, particularly Flood Defence
- Make sure the designs are suitable for the people who are going to use them
- If the site is designated, obtain agreement from the organisation responsible for the designation, for example English Nature if the site is an SSSI.

Depending on the size of the site and the scale of your plans you may also wish to consult

- Neighbouring land owners
- Other services such as electricity/gas/BT
- Local Conservation, Recreation and Archeological Organisations and amenity groups
- Parish Council

### 5. PROCUREMENT

As stated earlier the intention is that the chosen details should, where ever possible, require the minimum amount of subsequent work. Some can be issued direct to contractors or others placed direct with manufacturers. The notes accompanying the designs should be read carefully as they often contain choices on the available options. In more complex cases the sheets can be used to form the basis of negotiations with contractors or other professionals, in which case they will act as the NRA Officer's brief. It is strongly suggested that this is accompanied by a meeting on site.

IT IS IMPORTANT WHEN PROCURING ITEMS TO ABIDE BY THE REGULATIONS CONTAINED IN THE FINANCIAL MEMORANDUM AND SCHEME OF DELEGATION, AND TO ADHERE TO THE NRA'S ENVIRONMENTAL POLICY

### 6. FEEDBACK

A manual such as this one is only as good as its usefulness to others. Comments, using the attached proforma, on the structure, content and designs are welcome and should be forwarded to the Recreation and Navigation Officer at Head Office.

## PART A: USER GUIDE

### PROFORMA FOR COMMENTS

To retain its usefulness this manual needs to be both comprehensive and up to date, for this reason the manual's organisation allows additions and deletions to be made without affecting the overall structure.

The comments of all users of the manual are welcomed and we intend to take these comments on board and issue updates.

All comments should be made on a copy of the following proforma, this will assist us in the compilation of comments and ultimately increase the speed at which the manual is revised.

#### 1.0 DETAILS OF RESPONDENT

1.1 Comments supplied by:

\_\_\_\_\_

Tel:

\_\_\_\_\_

Fax:

\_\_\_\_\_

1.2 Job title:

\_\_\_\_\_

1.3 Are you directly involved in the specification of items on recreation sites:

Yes [ ] No [ ]

1.4 If so what is the approximate value of projects implemented in the last financial year?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

#### 2.0 PART A: USER GUIDE

2.1 This is intended as an introduction and guide to the entire document to help you the user to make the best use of the manual.

In what way could this section be improved?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

#### 3.0 PART B: DETAILS, PRODUCTS AND FACILITIES INFORMATION

3.1 This section is intended to be a comprehensive catalogue of all elements considered likely to be encountered by Recreation Officers.

What items should be added or omitted in future editions?:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



## PART A: USER GUIDE

### PROFORMA FOR COMMENTS

3.2 We have aimed at a comprehensive selection of details. What items would you like to see added in future editions?

1.0 Surfaces

2.0 Structures

3.0 Furniture

4.0 Specialist Items

Could you supply a detail and/or photograph for inclusion?

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### 4.0 PART C: REFERENCE INFORMATION

4.1 Are there any product references or suppliers you think should be added?

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4.2 Are there any useful organisations which should be added?

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4.3 Are there any publications which you are aware of which should be incorporated in the bibliography?

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### 5.0 FURTHER COMMENTS

5.1 Please make any further comments which you think could lead to improvements to the manual.

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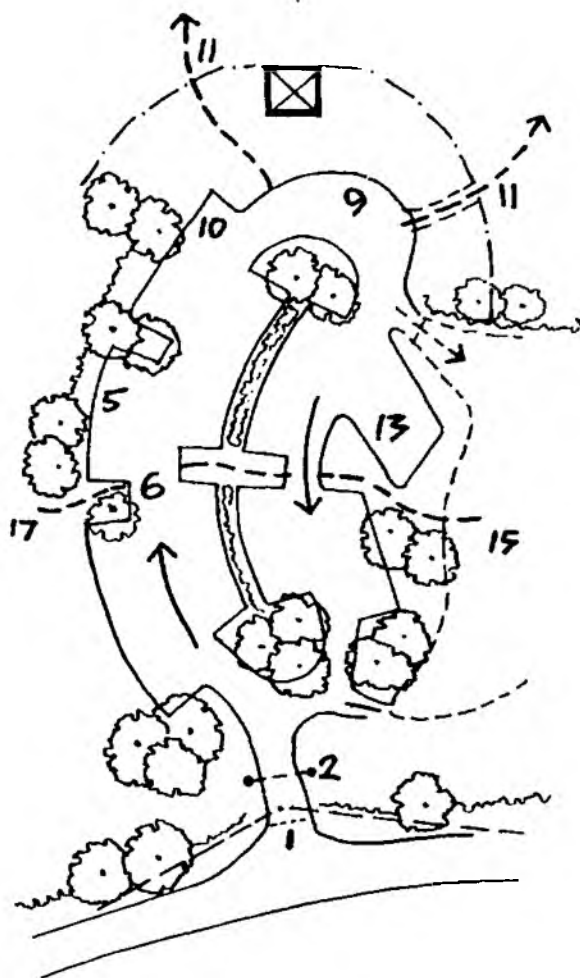
### 6.0 PLEASE RETURN FORM TO:

Recreation and Navigation Officer  
National Rivers Authority  
Head Office, Bristol

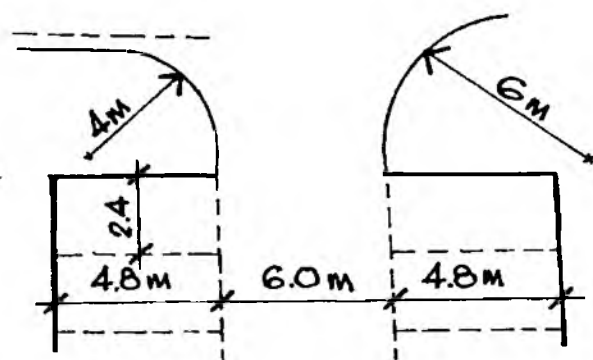
## 1.1 SURFACES: CAR PARKS

### 1.1.1 CAR PARKS: DESIGN GUIDELINES

1 OF 4



- |                     |                       |
|---------------------|-----------------------|
| 1. Access           | 10. Disabled parking  |
| 2. Access control   | 11. Vehicle restraint |
| 5. Bay groupings    | 13. Coach/mini-bus    |
| 6. Gradients        | 15. Overflow parking  |
| 9. Drop off/pick up | 17. Pedestrian links  |



Source: LUC

As most people will arrive by car, parking areas should be safe, logical and visually appropriate. A well designed car park will achieve these objectives and create a good initial impression to visitors.

Unless the parking provision is very limited skilled assistance will probably be required and in nearly all cases planning approval will be needed.

Whether you are designing the facility or briefing others the following considerations need to be made:

#### ACCESS:

Site car park to minimise loss of trees/vegetation, and maximise visibility. Bellmouth sizes and visibility splays will be determined by local authority regulations and local context (seek local authority advice). The limit of the public highway will require demarcation - two rows of granite setts is a typical solution (see 1.3.5).

#### ACCESS CONTROL:

Consider need for height restrictor (see 2.6.4) or lockable gate (see 2.5.1). Speed restrictions (see 1.1.8) may be necessary to slow vehicles on access roads.

#### LAYOUT:

Aim for a clockwise search pattern with a minimum of dead ends. Adapt layout to suit site particularly landform and existing hedges and trees. (Remember root spread is equivalent to branch spread and wherever possible avoid altering levels in these zones).

#### DIMENSIONS:

Use 2.4 x 4.8m bays at right angles to 6m wide aisles. This is the most cost and space effective parking system. (Oblique parking also requires more markings and vehicular control). Access road generally 5.5m width. Turning circles generally 4m minimum radii or 6m minimum radii if coach or service vehicle access is required.

## 1.1 SURFACES: CAR PARKS

### 1.1.1 CAR PARKS: DESIGN GUIDELINES

2 OF 4

#### BAY GROUPINGS:

Bays should generally be placed in groups of 8–20 cars divided by soft or hard landscape features dependent on context. Group sizes can vary to accommodate retained landscape features. Remember visibility considerations.

#### GRADIENTS:

Parking areas should be as near level as practical with 1:30–1:50 grades for drainage. Maximum tolerable gradients are around 1:20 across the short dimension of the bays and around 1:10 on the long dimension. The area between groups of bays can be useful for taking up differences in levels and ramps can be as much as 1:5 but allowance should be made for transition zones at junctions with shallower slopes. (These slopes will not be suitable for wheelchairs or buggy users).

#### SURFACES:

Section 1.1 gives details of possible surfaces and edge details. Consideration should be given to level of expected use, wear and tear, local materials, likely wet weather usage. Alternatives generally range from tar spray and chip on bitmac through scalping or Department of Transport Type 1.

#### DRAINAGE:

Unless a sealed surface is chosen drainage will be through the surface. Consider perimeter ditches on the down slope edges and their discharges.

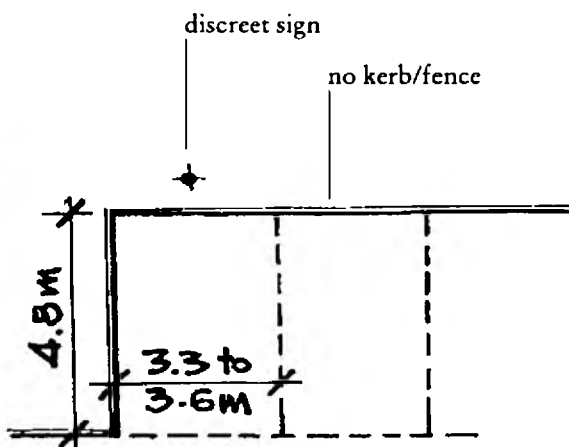
#### DROP OFF/PICK UP:

For car parks with a finite destination (entrance or built facility) a drop off/pick up facility may be advantageous. This should be 3.0m wide and 7.5m minimum length parallel to an access road.

#### DISABLED PARKING:

A limited number (5% of maximum) of bays should be provided as close as feasible to the drop off point, with level surface and 3.3–3.6m bay width. Consider surfaces more suitable to wheel-chairs, avoid kerbs and incorporate discreet signage.

See the Access for All design guidelines 1.8.1 for further details.



Source: LUC

## 1.1 SURFACES: CAR PARKS

### 1.1.1 CAR PARKS: DESIGN GUIDELINES

3 OF 4

#### VEHICLE RESTRAINT:

Consider use of bollards and low horizontal rails (see 3.3 and 2.6.1) for additional vehicular restraint. Consider use of motorcycle barriers and/or lockable maintenance access gate to control access to site itself.

#### SAFETY:

Achieve low vehicle speeds through use of localised road narrowing (3.5m minimum width), speed restrictors (see 1.1.8) tight radius kerbs and rumble strips.

#### MINI-BUSES AND COACHES:

Bay sizes if so required should be 3.5m wide x 5.2m length (mini-buses) and 4m wide x 12m length (coaches) with a 16m aisle width to allow access of 13m radius turning circle. If mini-bus or coach drop-off points are provided these must be on the nearside of the vehicle for safety reasons.

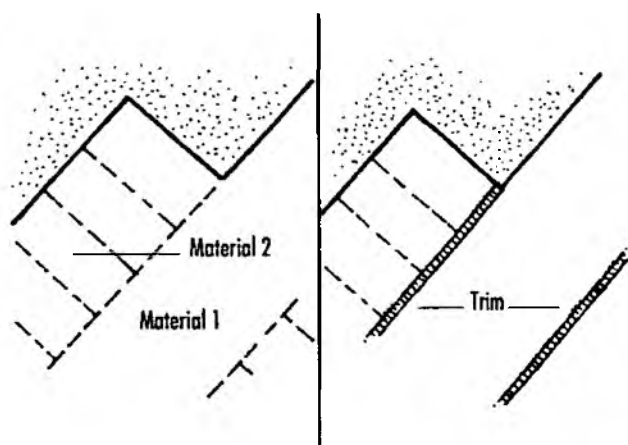
Coaches in particular tend to scour unsealed surfaces when using tight lock turns. Surface type or maintenance regimes should make allowance for this.

#### MARKING:

All likely surfaces preclude the easy marking of bays and the marking of individual bays would be inappropriate in most contexts. Orderly parking should be achieved through the layout of the groups of bays possibly emphasised by different surfacing to delineate aisle from bay or the use of trim (see 1.3) to demarcate the leading edge of the bays. Usage of bays will be inevitably less efficient with approximately 10% lost due to careless parking.

#### OVERFLOW PARKING:

Parking take up will typically vary and overflow parking areas should be considered for peak periods. Surfaces can be well drained level grass or more formal laid surfaces such as DoT Type 1. In either case entry, exit and other higher wear locations should be surfaced. The use of concrete or plastic reinforced grass is to be avoided unless there are overbearing visual reasons – these surfaces are 2–3 times more expensive than sealed surfaces and can provide difficulties for pedestrians.



Source: LUC

## 1.1 SURFACES: CAR PARKS

### 1.1.1 CAR PARKS: DESIGN GUIDELINES

4 OF 4

#### SIGNAGE:

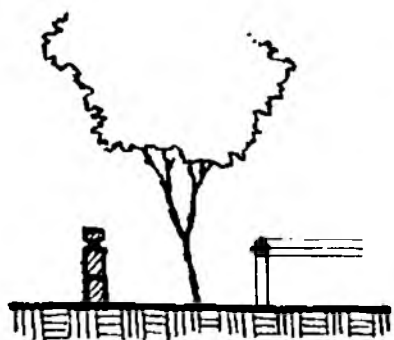
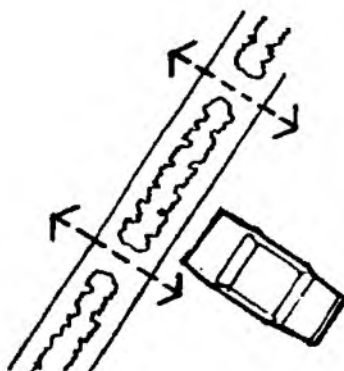
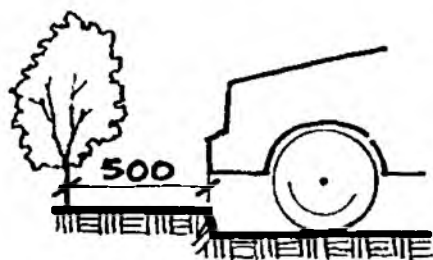
With a logical layout the need for signage should be restricted to: indication of entry and exit, one way circulation (if applicable) possible details as to name and opening times and NRA regulations, directional signs and interpretation (if applicable), disabled parking bays and drop-off/pick up points. Siting should consider vehicular speed and particularly visibility avoiding locations which will be obscured by parked cars.

#### PEDESTRIAN CIRCULATION:

Consider desire lines, safety and access for all requirements.

#### SOFT LANDSCAPE:

Attention to integration of car park levels to that of the surrounding terrain is equally important to vegetative screening. Remember this screening should not reduce logic nor safety of car park and should not impose itself on likely desire lines (or else trampled planting will follow). Where hedges are provided between ranks of cars allow 500mm from back of bay to hedge to allow for bumper overhang and provide periodic gaps for access between ranks. Protect trees by bollards or rails (see 2.6 and 3.3). Consider maintenance implications. Generally limited, well placed and appropriate planting is the most effective landscaping with the emphasis on perimeter screening - seek the professional advice of a Landscape Architect.



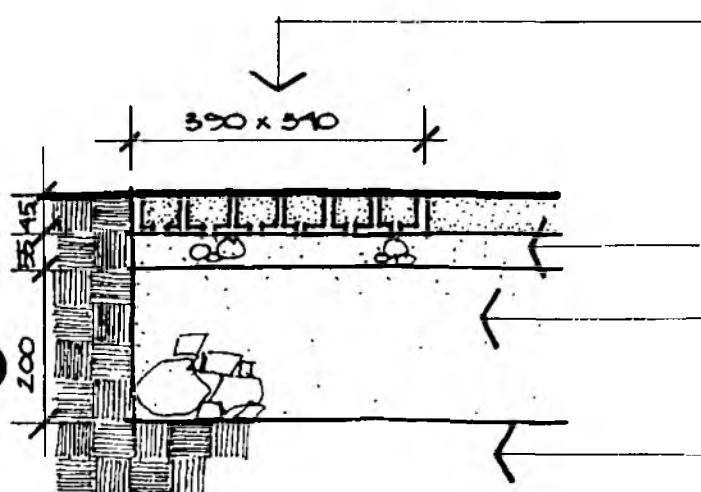
Source: LUC



## 1.1 SURFACES: CAR PARKS

### 1.1.2 PLASTIC REINFORCED GRASS

SCALE 1:10 1 OF 1



Section

Plastic panel unit size 390 x 340 x 45 mm. Voids of honeycomb unit filled with 50% approved top soil and 50% sharp sand.

Consolidated gravel layer

200mm DoT type 1 sub-base compacted and laid to falls.

Formation excavated to correct line/level and compacted. Weeds killed and proof rolled with any soft spots excavated and back-filled with suitable compacted material.

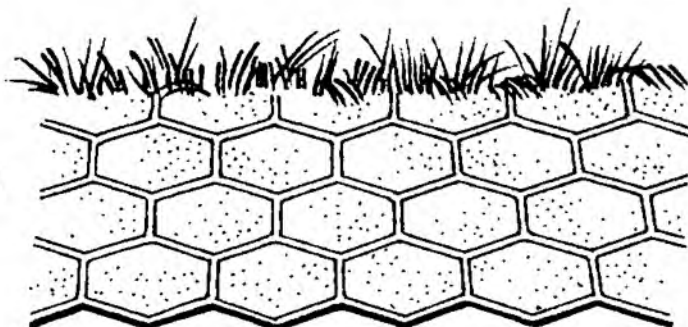
Source: LUC

#### USAGE

A high cost solution for accommodating occasional vehicular traffic on a grass surface. Allows emergency access routes to be placed in landscape areas without visual interference.

#### NOTES

Proprietary polyethylene units are available from several manufacturers, who should be contacted to obtain precise laying details for the loadings envisaged (ie. cars, buses, fire tenders, etc)



Refer to: 1.1.1 Car Parks: Design guidelines

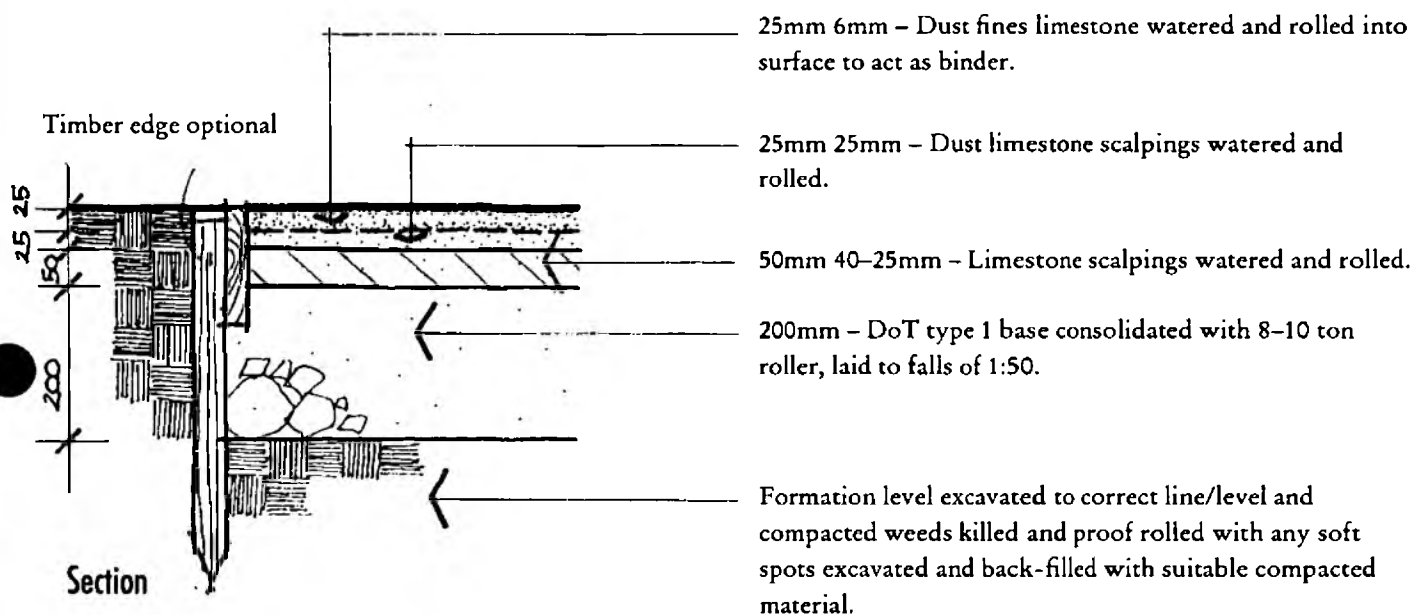
Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
—	+	+	+	•	•	<b>R/S/U</b>
Low + Medium • High —	Good + Medium • Poor —	Good + Medium • Poor —	Low + Medium • High —	Good + Medium • Poor —	Good + Medium • Poor —	Rural R Semi-rural S Urban U

## 1.1 SURFACES: CAR PARKS

### 1.1.3 SCALPINGS

SCALE 1:10

1 OF 1



Source: LUC

#### USAGE

A crushed stone surface with an appearance sympathetic to rural or semi-rural locations. Most appropriate in regions where limestone forms part of the local geology as the initial white/light grey colour of the material can be a little incongruous in other areas.

#### NOTES

An edge is optional and depends on the final appearance. The required presence of a timber edge will ensure a more formal appearance. Absence of an edge allows a very informal look as grass will 'bleed' into the surface.

Refer to: 1.1.1 Car Parks: Design guidelines / 1.3.3 Timber board edge

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
+	+	●	●	+	●	<b>R/S</b>
Low + Medium ● High –	Good + Medium ● Poor –	Good + Medium ● Poor –	Low + Medium ● High –	Good + Medium ● Poor –	Good + Medium ● Poor –	Rural R Semi-rural S Urban U

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## PART B

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### RECOMMENDED DETAILS, PRODUCTS AND FACILITIES INFORMATION

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PART B



NRA

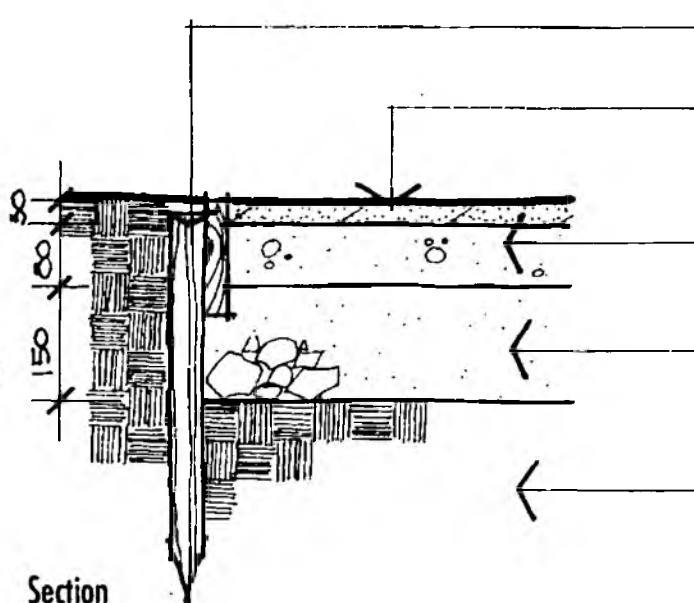
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## 1.1 SURFACES: CAR PARKS

### 1.1.4 BITMAC

SCALE 1:10 1 OF 1



Timber board edge (see sheet 1.3.3)

Wearing course of 10mm size open graded macadam to BS 4987, nominal thickness 30mm.

80mm – Tarmacadam base course in accordance with DoT clause 906 and BS 4987.

150mm – DoT type 1 sub-base compacted and laid to falls See DoT clause for material and laying.

Formation excavated to correct line/levels and compacted. Weeds killed and proof rolled with any soft spots excavated and back-filled with suitable compacted material.

Source: LUC

#### NOTES

Surface must be laid to falls; usually lateral falls of 1:40; Longitudinal falls of 1:100. In areas where a surface water drainage system is available, gulleys will need to be incorporated.

Refer to DoT "Spec. for road and bridge works 1976" for further detail of clauses.

Herbicide should only be used in accordance with NRA Policy.

For locations where goods traffic is expected a superior specification will be required.

#### USAGE

The hot rolled asphalt wearing course provides a smooth textured, black finish, probably only appropriate in urban situations where it can be easily white-lined to denote spaces for cars.

In rural and semi-rural locations for car parks and access roads – Tar, spray and chip surface gives an informal finish and better skid resistance.

Refer to: 1.1.1 Car Parks: Design guidelines / 1.3.3 Timber board edge

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
–	–	+	+	•	+	U
Low + Medium • High –	Good + Medium • Poor –	Good + Medium • Poor –	Low + Medium • High –	Good + Medium • Poor –	Good + Medium • Poor –	Rural R Semi-rural S Urban U



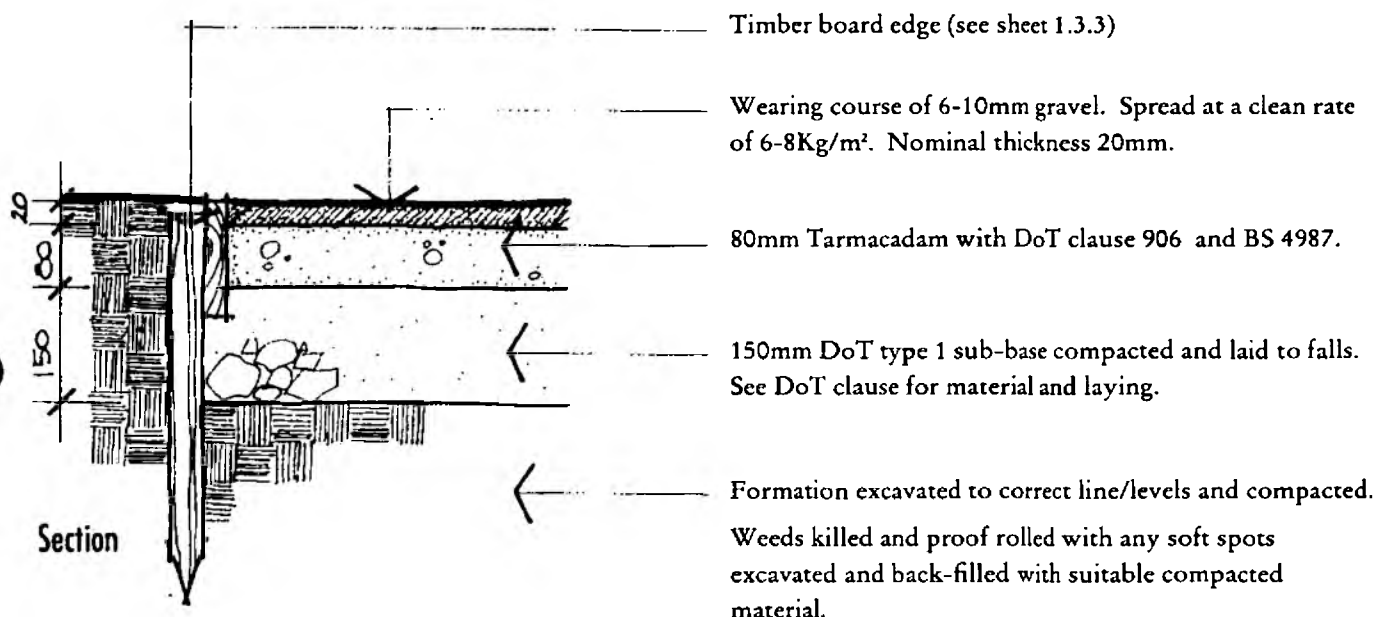
## 1.1 SURFACES: CAR PARKS

### 1.1.5 TAR SPRAY AND CHIP

SCALE 1:10

1 OF 1

Source: LUC



#### NOTES

Surface must be laid to falls; usually lateral falls of 1:40; Longitudinal falls of 1:100. In areas where a surface water drainage system is available, gulleys will need to be incorporated.

Refer to DoT "spec. for road and bridge works 1976" for further detail of clauses.

Herbicide should only be used in accordance with NRA Policy.

The use of locally sourced gravels will ensure that surfaces appear more sympathetic with the local environment.

Wearing course gravel as a binder in accordance with DoT 915 to binder of cationic emulsion classification K1-70 spread at a rate of 1.21/m<sup>2</sup> and temp 80°C, to DoT 916.

For locations where goods traffic is expected a superior specification will be required.

#### USAGE

A relatively inexpensive Bitmac surface for light vehicular wear. The gravel texture and colour creates an informal effect with good wearing qualities.

In rural, semi-rural and urban locations suitable for car parks and access roads. Tar, spray and chip surface gives an informal finish and better skid resistance than smooth Bitmac.

Refer to: 1.1.1 Car Parks: Design guidelines / 1.2.4 Footpaths: Tar spray and chip / 1.3.3 Timber board edge

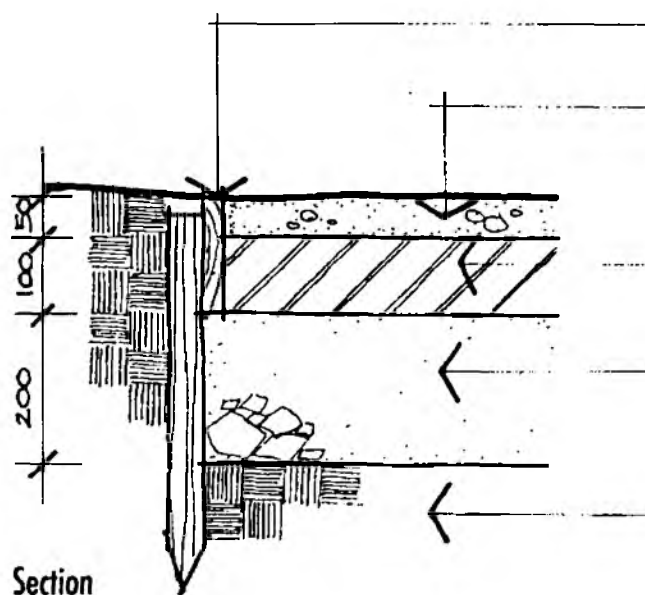
Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
●	●	+	+	●	+	<b>R/S/U</b>
Low + Medium ● High -	Good + Medium ● Poor -	Good + Medium ● Poor -	Low + Medium ● High -	Good + Medium ● Poor -	Good + Medium ● Poor -	Rural R Semi-rural S Urban U

## 1.1 SURFACES: CAR PARKS

### 1.1.6 GRAVEL DRESSED HOGGIN OR LOCAL EQUIVALENT

SCALE 1:10

1 OF 1



Source: LUC

Timber board edge optional (see sheet 1.3.3)

20mm clean rounded (not crushed) gravel won from local source and rolled into Hoggin layer.

100mm approved Hoggin from local source compacted with 500Kg vibrating roller.

200mm DoT type 1 sub-base compacted and laid to falls.

Formation excavated to correct line/levels and compacted.

Weeds killed and proof rolled with any soft spots excavated and back-filled with suitable compacted material.

#### USAGE

An informal car park surface suitable for rural locations.

#### NOTES

Gravel is to be incorporated into the Hoggin in areas of vehicular traffic. In time further gravel should be added to prevent rutting of Hoggin especially on corners which receive considerable wear.

Herbicide should only be used in accordance with NRA Policy.

Refer to: 1.1.1 Car Parks: Design guidelines / 1.2.2 Footpaths: Hoggin / 1.3.3 Timber board edge

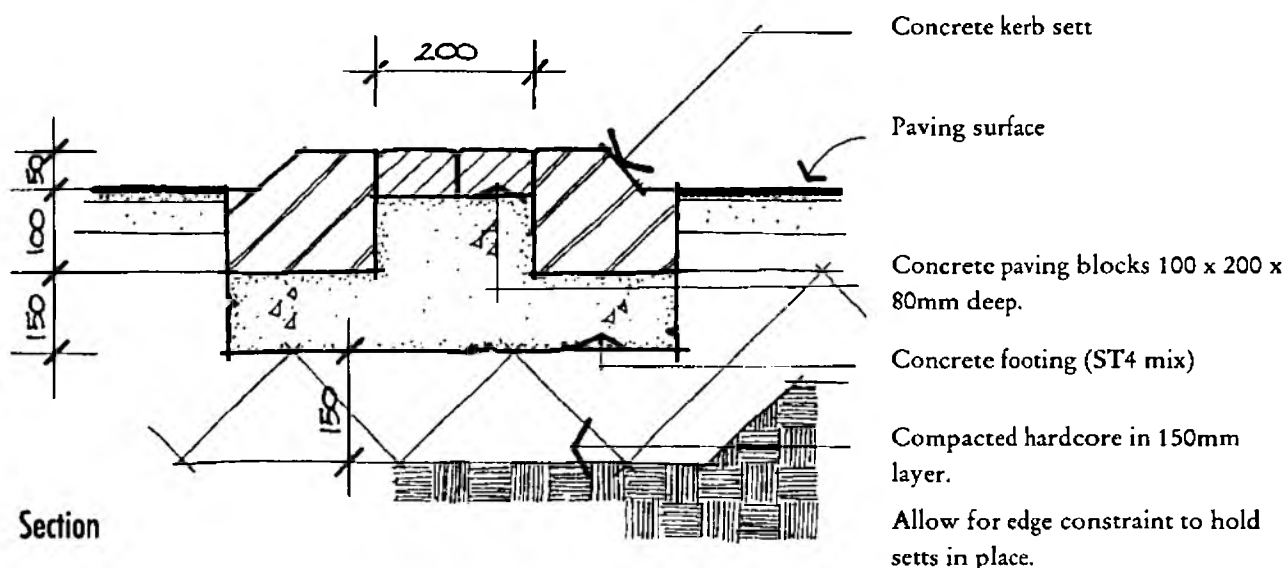
Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
+	+	●	●	+	●	<b>R/S</b>
Low + Medium ● High -	Good + Medium ● Poor -	Good + Medium ● Poor -	Low + Medium ● High -	Good + Medium ● Poor -	Good + Medium ● Poor -	Rural R Semi-rural S Urban U

## 1.1 SURFACES: CAR PARKS

### 1.1.7 CONCRETE BLOCK SPEED RESTRICTOR

SCALE 1:10

1 OF 1



Source: LUC, Adapted from Littlewood, M, (1993).

#### USAGE

A detail for urban and semi-rural situations where rumble strips with a quality finish are required to slow traffic. This detail is preferable to Bitumen Macadam Sleeping Policemen and other solutions.

#### NOTES

Concrete paving blocks are widely available in metre sizes and in a variety of colours. Granite setts can be used as an alternative. Concrete kerb setts are available from various suppliers in different formats.

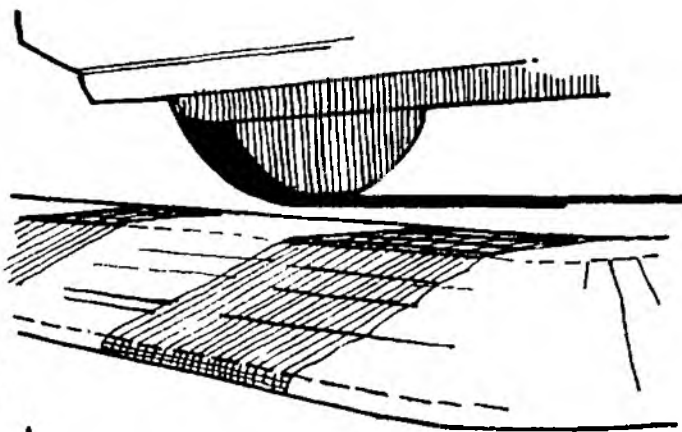
Refer to: 1.1.1 Car Parks: Design guidelines / 1.1.8 Proprietary speed restrictor / Part C 1.0 Suppliers

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
●	●	+	+	●	●	<b>U</b>
Low + Medium ● High -	Good + Medium ● Poor -	Good + Medium ● Poor -	Low + Medium ● High -	Good + Medium ● Poor -	Good + Medium ● Poor -	Rural R Semi-rural S Urban U

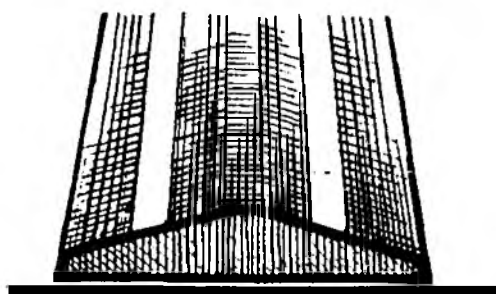
## 1.1 SURFACES: CAR PARKS

### 1.1.8 PROPRIETARY SPEED RESTRICTOR

1 OF 1



A



B



C

#### SPECIFICATIONS

Size – Speed restrictors can be cut to fit any width of road and will suit any road camber.

Finish: Black rubber polymer with yellow strips for day time warning and with built in cat eyes for night time warning.

Fixing: Bolt into ground as manufacturer's detail specifies.

#### USAGE

Suitable for urban and some semi-rural locations.

Particularly useful in pedestrian priority areas to slow down traffic.

#### NOTES

Options: Speed restrictors can be specified either to slow speed to 5 mph or to 10–15 mph.

Use speed restrictor traffic signs in conjunction with speed ramps to be installed as manufacturer's specification.

Refer to: 1.1.1 Car Parks: Design guidelines / 1.1.7 Speed restrictor / Part C: suppliers

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
+	+	+	+	•		<b>R/S/U</b>
Low + Medium • High –	Good + Medium • Poor –	Good + Medium • Poor –	Low + Medium • High –	Good + Medium • Poor –	Good + Medium • Poor –	Rural R Semi-rural S Urban U

## 1.2 SURFACES: FOOTPATHS

### 1.2.1 FOOTPATHS: DESIGN GUIDELINES

1 OF 1

#### FUNCTION:

The primary function of any pedestrian paved surface is to provide a hard, dry, non-slip surface which will carry the required pedestrian loads. However footpaths also have other functions including:

#### Direction:

The orientation and surfacing of paths can manipulate the way in which people circulate around a site. However this cannot be taken to extremes, as the "desire line" (shortest and most convenient route between A and B) must be catered for, otherwise worn paths across grass will result.

#### Hierarchy:

By using paths of different widths and surfaces within a site a hierarchy of routes can be established.

#### Hazard:

Where pedestrian surfaces meet vehicular routes a change in material helps to indicate change of function. This technique can also draw attention to changes in level, e.g. steps/ramp.

#### Ownership:

Change of material can indicate change in land ownership.

#### Repose:

A subtle change in material can indicate a seating area or viewing point.

#### CHOICE OF MATERIAL:

It is preferable to reflect the local vernacular as this creates a sense of place. The following checklist will assist in the selection of an appropriate surface.

#### Cost and Availability:

High capital cost is usually, but not always, matched by low maintenance costs. Locally quarried materials are generally easily obtained, cost effective and will suit the local vernacular.

#### Appearance and Weathering:

Textural range and colour suitability should be considered. Natural materials tend to weather unevenly, but in so doing become more attractive and are especially suitable in rural and semi-rural locations.

#### Safety:

Surfaces which become slippery when wet are obviously to be avoided.

#### Drainage:

Do ground conditions or site location suggest the use of an impervious surface with full drainage, or can a natural pervious paving be used?

#### DESIGN:

Consider the following:

#### Width:

The relative hierarchy of a path will determine the width required. A minor path wide enough for one person need be only 600mm wide, whilst a shared cycle and pedestrian path must be a minimum of 2m wide.

#### Orientation:

While it is important to accommodate desire lines, straight paths are monotonous for pedestrians. The alignment of a path should present pedestrians with a varied range of views, with the control of adjacent vegetation 'windows' can be opened up to further vary the visitors experience.

#### Surfaces:

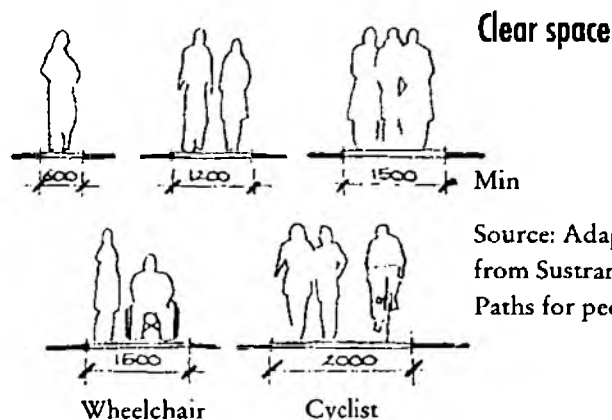
Consult detail sheets and refer to Choice of Material.

#### Gradients:

Wherever possible 1:12 should be the maximum gradient used, gradients greater than this are not easily negotiable by wheelchair or buggy users.

#### Drainage:

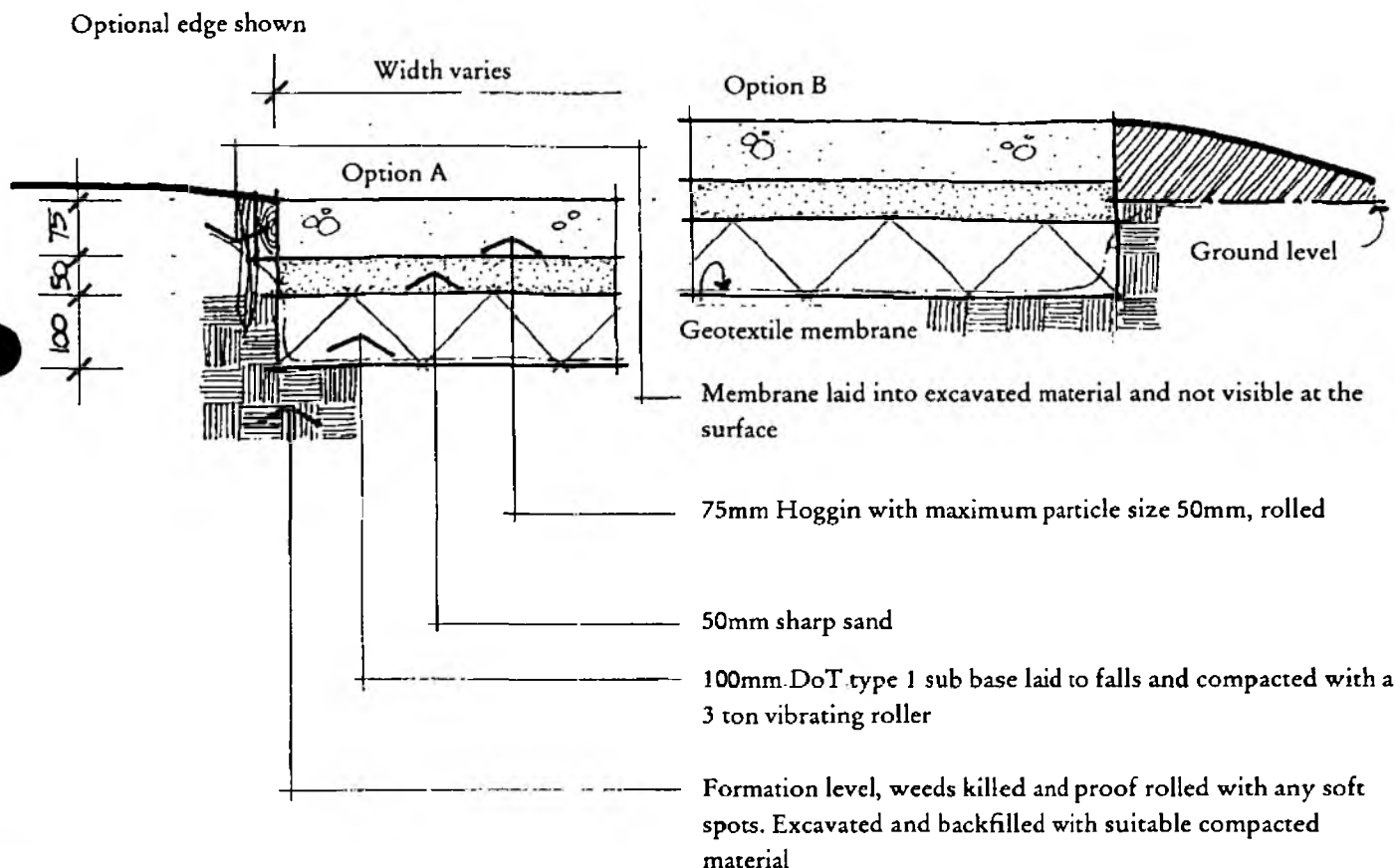
Unless a sealed surface is chosen drainage will be through the surface. Generally a cross fall of between 1:50 and 1:40 is recommended on all surfaces. In urban areas where surface water discharge facilities are available these will have to be utilised with the incorporation of gullies and underground piped connections.



## 1.2 SURFACES: FOOTPATHS

### 1.2.2 HOGGIN

SCALE 1:10 1 OF 1



#### Notes

For membrane notes see sheet 1.2.3

#### Usage

A natural buff colour material suitable for pedestrian surfaces in rural and semi-rural locations. Hoggin requires a degree of moisture to ensure binding. However, it is not suitable for very damp conditions where it may become saturated and impassable.

Refer to: 1.1.6 Car Parks: Gravel dressed hoggin / 1.2.1 Footpaths: Design guidelines / 1.3.3 Timber board edge

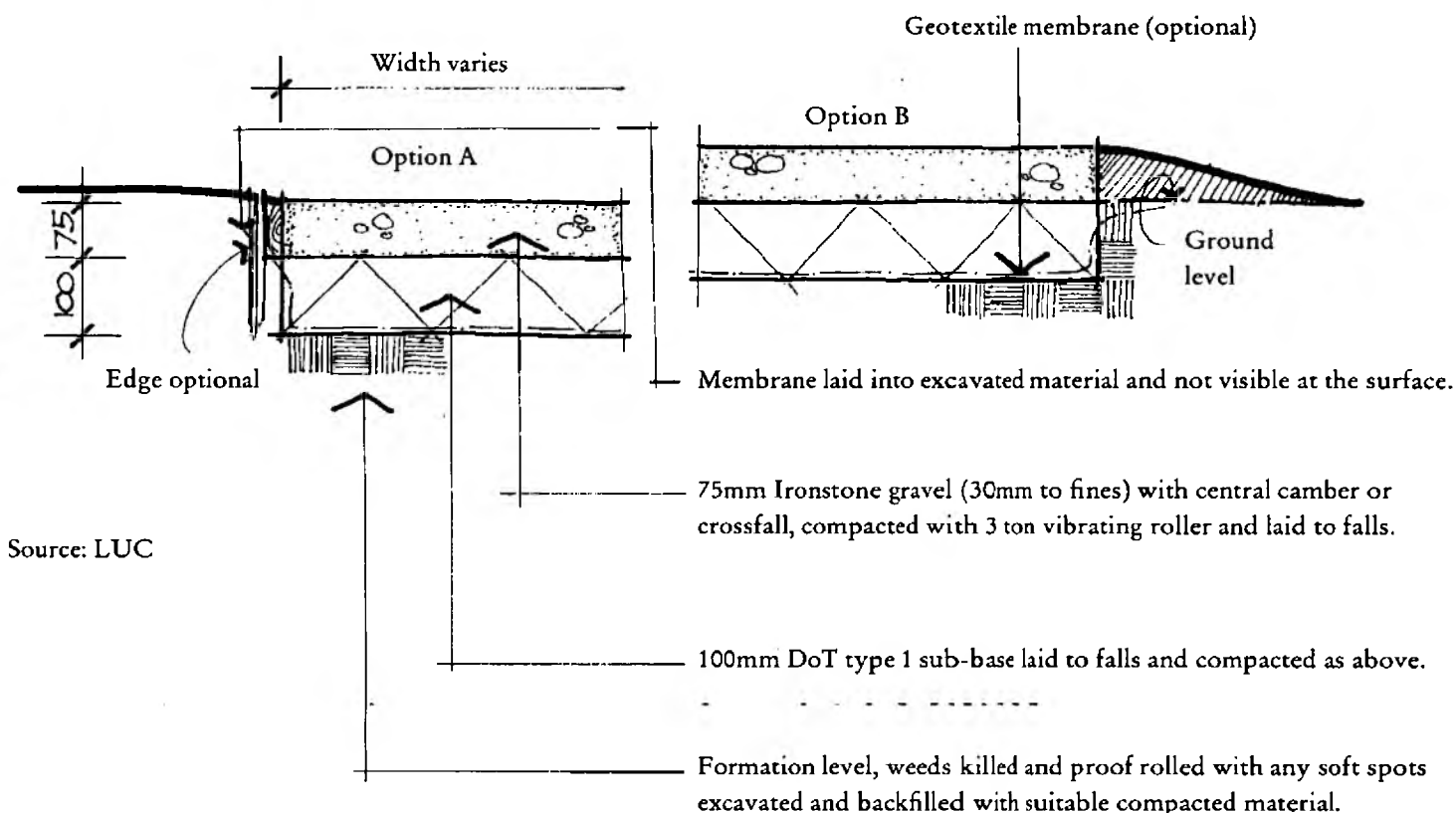
Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
+	+	•	—	+	—	<b>R/S</b>
Low + Medium • High —	Good + Medium • Poor —	Good + Medium • Poor —	Low + Medium • High —	Good + Medium • Poor —	Good + Medium • Poor —	Rural R Semi rural S Urban U

## 1.2 SURFACES: FOOTPATHS

### 1.2.3 IRONSTONE GRAVEL

SCALE 1:10

1 OF 2



Source: LUC

#### USAGE

A natural amber coloured material suitable for pedestrian surfaces in rural and semi-rural situations. Its relatively free draining nature makes it more suitable for wet areas than Hoggin (see sheet 1.2.2)

Use of a Timber edge is appropriate where a more formal finish is required.

#### NOTES

Options A and B show alternative construction methods.

Herbicides should only be used in accordance with NRA Policy.

Geotextile membrane laid over formation level and extending up sides to depth of excavation; All joints lapped to min of 200mm.

Membrane is essential in areas where:

- Ground conditions are damp or wet
- Weeds are present and herbicide treatment is not possible.

Refer to: 1.2.1 Footpaths: Design guidelines / 1.3.3 Timber board edge

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
+	+	●	●	+	●	<b>R/S</b>
Low + Medium ● High -	Good + Medium ● Poor -	Good + Medium ● Poor -	Low + Medium ● High -	Good + Medium ● Poor -	Good + Medium ● Poor -	Rural R Semi rural S Urban U

## 1.2 SURFACES: FOOTPATHS

### 1.2.3 IRONSTONE GRAVEL

SCALE 1:10 2 OF 2

#### Option A:

Ground excavated to full depth of construction. Path edge is flush with surrounding ground level. This results in large quantities of material for disposal on or off-site and may result in drainage problems in wet areas.

#### Option B:

Only half of the construction depth is excavated with much of the arisings used to build up path edges. This results in the path being raised above the surrounding ground level and reduces resultant arisings and ensures a drier path surface in damp conditions.

Refer to: 1.2.1 Footpaths: Design guidelines / 1.3.3 Timber board edge

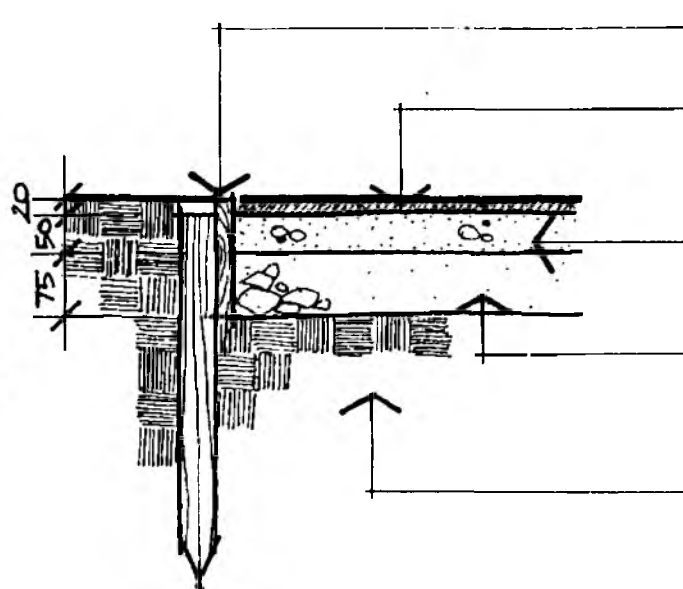
Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
+	+	●	●	+	●	<b>R/S</b>
Low + Medium ● High —	Good + Medium ● Poor —	Good + Medium ● Poor —	Low + Medium ● High —	Good + Medium ● Poor —	Good + Medium ● Poor —	Rural R Semi-rural S Urban U



## 1.2 SURFACES: FOOTPATHS

### 1.2.4 TAR SPRAY AND CHIP

SCALE 1:10 1 OF 1



Timber board edge (see sheet 1.3.3)

Wearing course of 6-10mm gravel spread at a rate of 6-8Kg/m<sup>2</sup>  
Nominal thickness 20mm.

50mm Tarmacadam base course in accordance with DoT clause 906 and BS 4987.

75mm DoT type 1 sub-base compacted and laid to falls.  
See DoT clause for material and laying.

Formation level excavated to correct line/level and compacted. Weeds killed and proof rolled with any soft spots excavated and back-filled with suitable compacted material.

Source: LUC

#### USAGE

A Bitmac surface for primary pedestrian routes in rural, semi-rural or urban sites.

The use of locally found gravels will ensure that surfaces appear sympathetic with the local environment.

#### NOTES

Surface should be laid either with a central camber or cross fall of min 1:50.

Herbicide should only be used in accordance with NRA Policy.

Refer to: 1.1.5 Car parks: Tar spray and chip / 1.2.1 Footpaths: Design guidelines / 1.3.3 Timber board edge

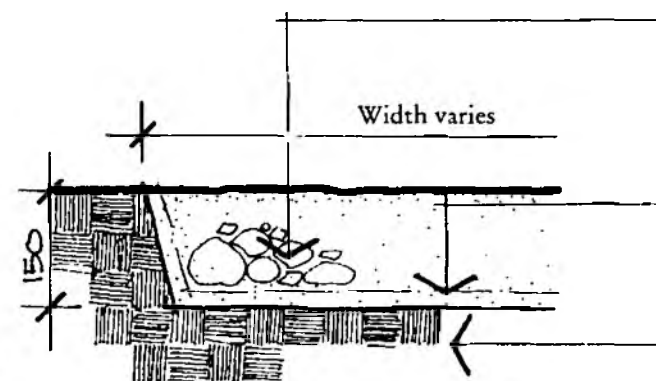
Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
●	●	+	+	●	+	<b>R/S</b>
Low + Medium ● High -	Good + Medium ● Poor -	Good + Medium ● Poor -	Low + Medium ● High -	Good + Medium ● Poor -	Good + Medium ● Poor -	Rural R Semi-rural S Urban U

## 1.2 SURFACES: FOOTPATHS

### 1.2.5 ROAD PLANINGS

SCALE 1:10

1 OF 1



Section

Road planings (waste product produced from road resurfacing works) laid to a depth of 150–200mm and compacted with a vibrating roller.

Geotextile membrane laid across excavation and not visible at surface.

Formation level excavated to correct line/level and compacted. Weeds killed and proof rolled with any soft spots excavated and back-filled with suitable compacted material.

Source: LUC

#### USAGE

An inexpensive path surface for rural and semi-rural locations.

Road planings will be free of charge once a local source from Highway Authority or contractor has been found.

#### NOTES

Initially the surface will have a rather coarse appearance. This can be diminished by spreading a small amount of soil/subsoil over the path edges. This will fill the interstices and encourage grass to 'bleed' over the path edges.

Herbicide should only be used in accordance with NRA Policy.

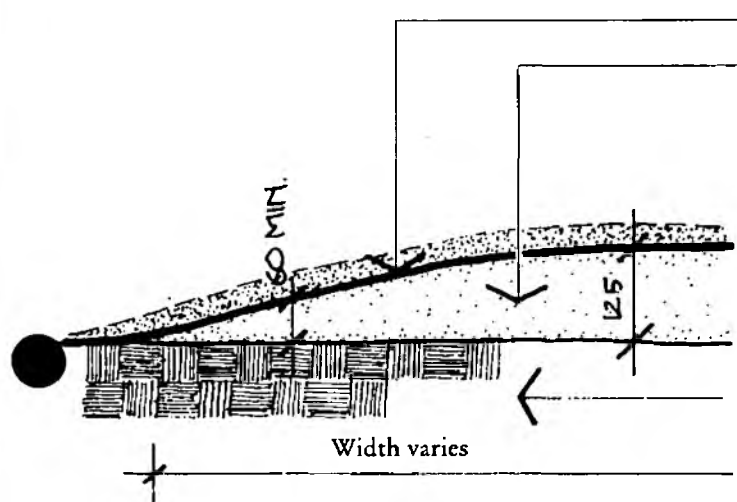
Refer to: 1.2.1 Footpaths: Design guidelines

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
+	+	+	+	+	●	R/S
Low + Medium ● High –	Good + Medium ● Poor –	Good + Medium ● Poor –	Low + Medium ● High –	Good + Medium ● Poor –	Good + Medium ● Poor –	Rural R Semi-rural S Urban U

## 1.2 SURFACES: FOOTPATHS

### 1.2.6 GRASS

SCALE 1:10 1 OF 1



50mm topsoil and grass seed layer

Layer of:

a) Pit gravel 25mm fines laid with central camber. Central depth of 125mm and lightly compacted

alternatively –

b) Site won gravel material if available can be laid in the same manner.

Formation level cleared of undergrowth and pernicious weeds, lightly compacted and refilled.

#### Section

Source: LUC

#### USAGE

An inexpensive path surface for lightly trafficked routes in rural or semi-rural areas.

#### NOTES

Grass is allowed to grow over path surface but pedestrian wear will suppress vegetation leaving the path defined. The free draining material ensures that the path remains passable when surrounding areas may be too wet underfoot.

Refer to: 1.1.2 Plastic reinforced grass / 1.2.1 Footpaths: Design guidelines

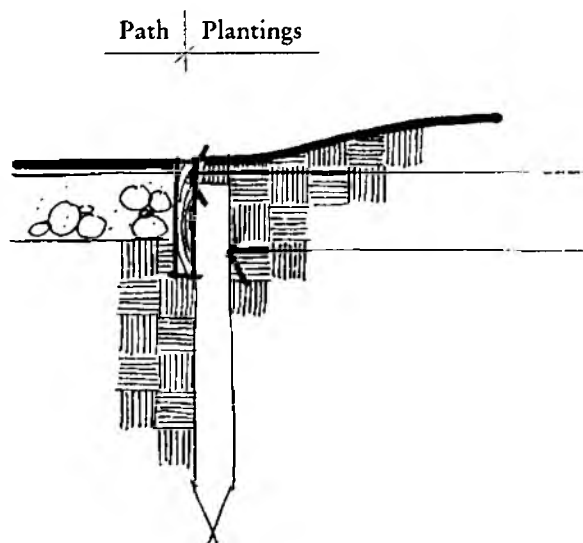
Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
+	+	•	+	+	–	<b>R/S</b>
Low + Medium • High –	Good + Medium • Poor –	Good + Medium • Poor –	Low + Medium • High –	Good + Medium • Poor –	Good + Medium • Poor –	Rural R Semi-rural S Urban U

## 1.3 SURFACES: EDGING

### 1.3.3 TIMBER BOARD EDGE

SCALE 1:10

1 OF 1



Softwood board 150 x 19mm for timber edge.

Softwood peg 38 x 38 x 450mm at min. 1200mm centres.

Double peg all board joints.

Peg tops to be 25mm below top of board.

Each peg to be twice nailed to board with galv. clout nails.

Radius boards to be notched on both sides to attain smooth curves.

Source: LUC

#### NOTES

Softwood to be pressure impregnated to BS 1282 (1975)

#### USAGE

Good cheap informal edging particularly suited to loose or bound gravel surfaces.

Will not withstand more than occasional trafficking by vehicles.

Refer to: 1.1 Car Parks / 1.2 Footpaths / 1.7 Steps and ramps

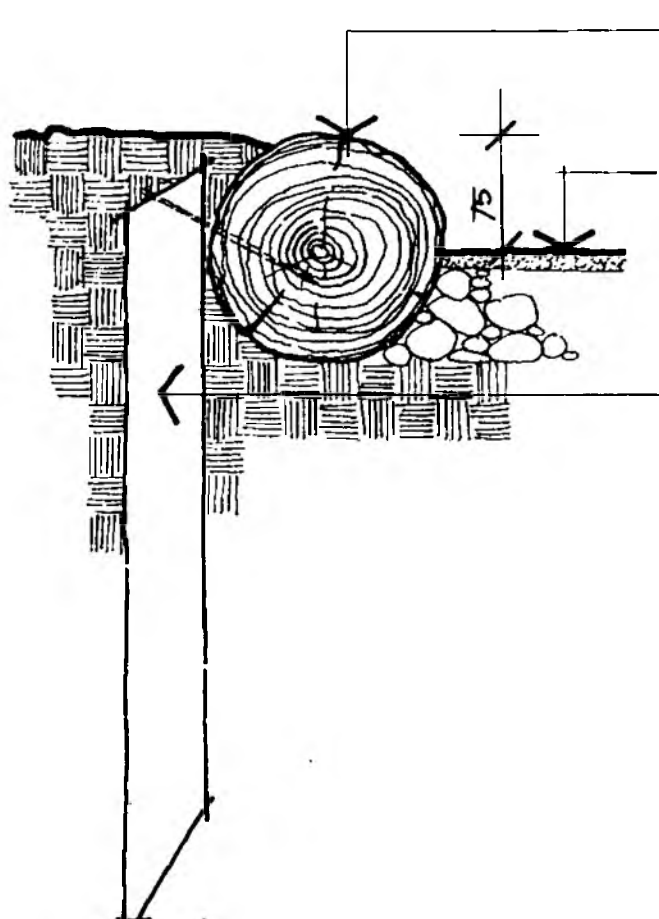
Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
+	+	•	•	+	•	<b>R/S/U</b>
Low + Medium • High –	Good + Medium • Poor –	Good + Medium • Poor –	Low + Medium • High –	Good + Medium • Poor –	Good + Medium • Poor –	Rural R Semi-rural S Urban U

## 1.3 SURFACES: EDGING

### 1.3.1 LOG EDGE

SCALE 1:5

1 OF 1



150 or 200 x 2000mm long softwood log

75mm gravel or other flexible surface

50 x 75 x 500mm driven softwood pegs placed at 1m centres and at either end of each horizontal. Fix with galv. steel nail.

#### USAGE

A simple low-key edge for rural sites where logs may be available on site. Life-span is relatively limited.

#### NOTES

All softwood to be pressure impregnated to BS 1282 (1975) unless it is site won material.

Source: LUC

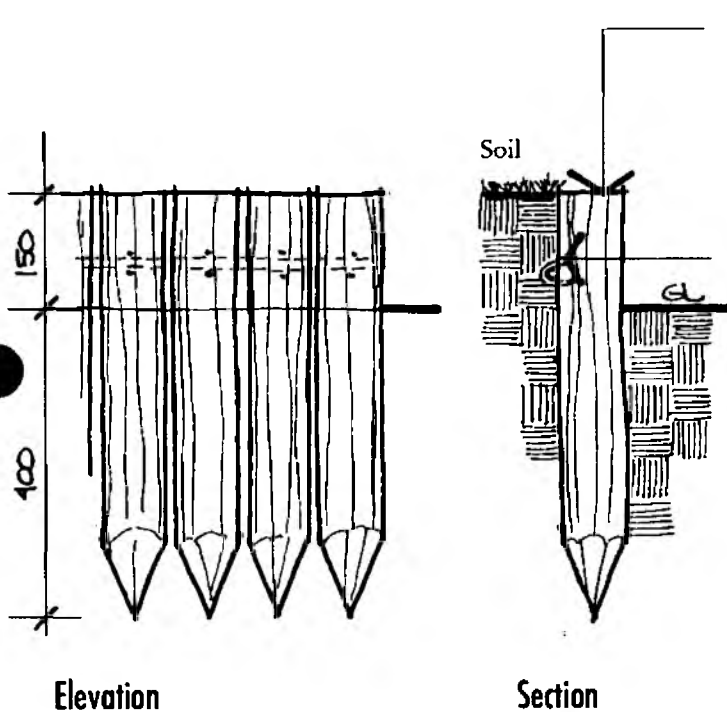
Refer to: 1.1 Car Parks / 1.2 Footpaths

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
+	+	●	●	●	●	R/S
Low + Medium ● High —	Good + Medium ● Poor —	Good + Medium ● Poor —	Low + Medium ● High —	Good + Medium ● Poor —	Good + Medium ● Poor —	Rural R Semirural S Urban U

## 1.3 SURFACES: EDGING

### 1.3.2 TIMBER STAKE EDGE

SCALE 1:10 1 OF 1



75mm diameter softwood posts driven into the ground  
Tops to be sawn level after posts are driven home  
All posts to be butt-jointed.

Heavy gauge wire stapled to 'inside' face of log kerb.

#### USAGE

A detail for rural locations where retaining edges are required to flexible surfaces such as gravel and Hoggin.

#### NOTES

Driven stakes are only appropriate where ground is soft/moderately soft. In firmer conditions it will be necessary to cut a trench and haunch the stakes in concrete, meaning pointed stakes are unnecessary.

All softwood to be pressure impregnated to BS 1282 (1975).

Source: LUC

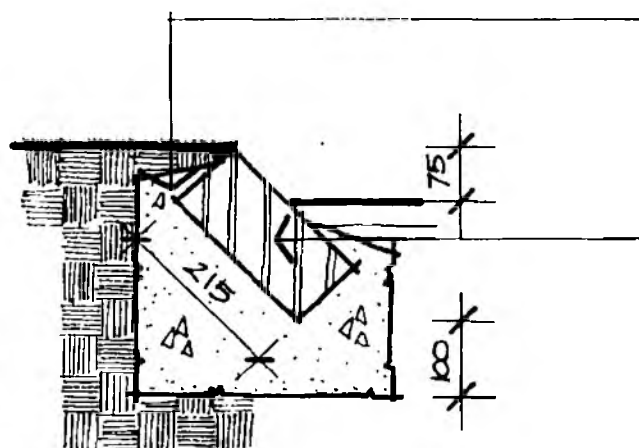
Refer to: 1.1 Car Parks / 1.2 Footpaths

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
+	+	-	●	+	-	<b>R</b>
Low + Medium ● High -	Good + Medium ● Poor -	Good + Medium ● Poor -	Low + Medium ● High -	Good + Medium ● Poor -	Good + Medium ● Poor -	Rural R Semi-rural S Urban U

## 1.3 SURFACES: EDGING

### 1.3.4 COUNTRYSIDE KERB

SCALE 1:10 1 OF 1



Haunch to allow soil to edge of kerb

Countryside kerb 250 x 215 x 100mm silver grey colour  
lain on batter, well haunched ST4 mix concrete.

Section

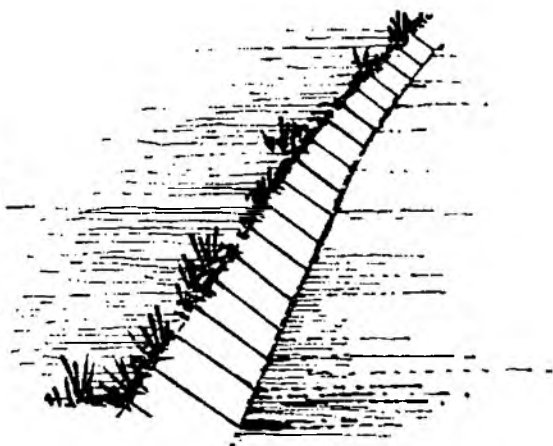
Source: LUC

#### USAGE

General purpose kerb use with Bitmac, tar spray or similar  
surfaces on access roads or parking areas in all contexts.

#### NOTES

Will not permit drainage run-off to reach soil  
surroundings – alternative means of discharge needed.



Refer to: 1.1 Car Parks / 1.2 Footpaths

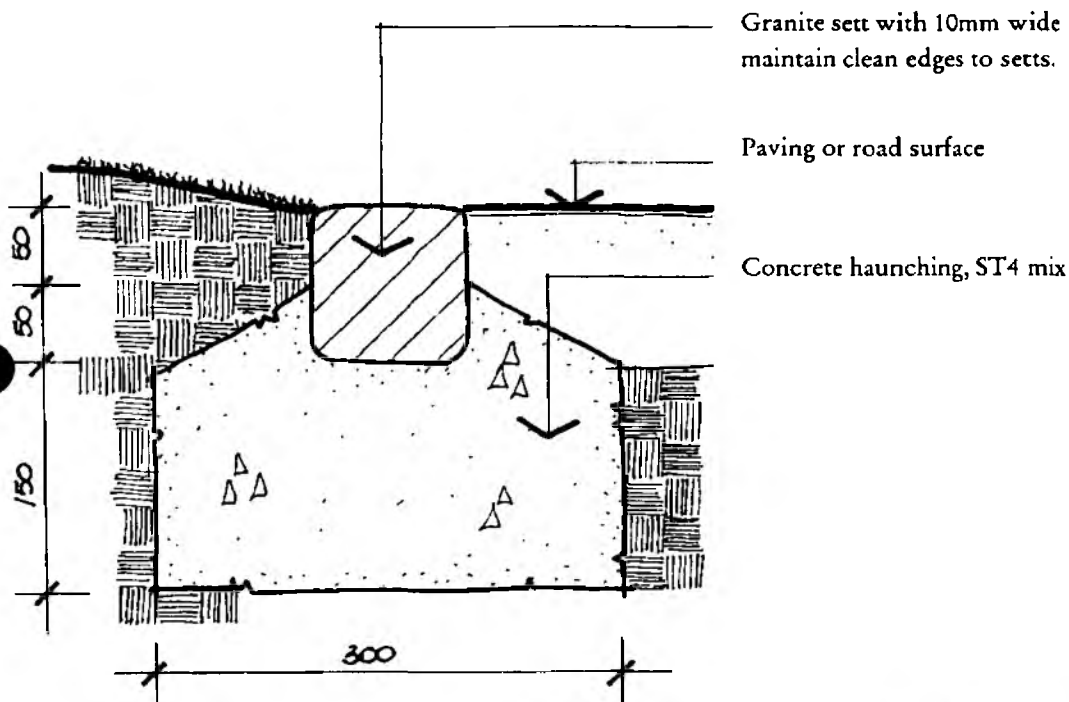
Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
–	•	+	+	•	–	<b>R/S/U</b>
Low + Medium • High –	Good + Medium • Poor –	Good + Medium • Poor –	Low + Medium • High –	Good + Medium • Poor –	Good + Medium • Poor –	Rural R Semi-rural S Urban U

## 1.3 SURFACES: EDGING

### 1.3.5 GRANITE SETT EDGE

SCALE 1:5

1 OF 1



Source: LUC

#### USAGE

Kerb or edge suitable for path or road edging in all contexts where appearance is important.

#### NOTES

1. Setts to BS 435 (1975) available new or reclaimed, standard sizes are 100 x 100 x 100mm or 100 x 100 x 20mm.
2. Not suitable for laying by any but experienced workforce.

Refer to: 1.1 Car Parks / 1.2 Footpaths

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
—	•	+	+	•	—	<b>R/S/U</b>
Low + Medium • High —	Good + Medium • Poor —	Good + Medium • Poor —	Low + Medium • High —	Good + Medium • Poor —	Good + Medium • Poor —	Rural R Semi-rural S Urban U



## 1.4 SURFACES: CYCLEWAYS

### 1.4.1 CYCLEWAYS: DESIGN GUIDELINES

#### FUNCTION:

A cycleway should offer a dry and smooth surface for cycling. With the increased interest in recreational cycling, cycleways have an important function in channelling cyclists through rural areas vulnerable to trespass or damage. A well signposted cycleway will guide cyclists along the correct route, allowing safe and convenient countryside access, and avoiding damage to vulnerable areas.

#### MATERIALS:

All the surface details included under footpaths (see 1.2) are suitable for cycleways as loadings are similar, except for the grass-path (1.2.6). The criteria for choice of materials are also as for footpaths however given the choice most cyclists would probably opt for a smooth bitumen macadam surface, as cycling on this is least effort. However cost may rule this out and it is important that, especially in rural sites aesthetic considerations are taken into account.

#### DESIGN

##### Configuration:

Cycleways are of three types (a) those which are totally separate from any footpath surface (b) those where footpath runs alongside, and (c) those which are shared footpath and cyclepath surfaces.

##### Delineation:

In a) and b) it helps if the cycleway can be denoted by the use of a different material. Red is the commonly used colour for cycle routes and this can be achieved subtly by using a slightly red aggregate in a tar, spray and chip surface (see 1.1.5). In cases where footpaths run parallel to cycleways a minor change in level using a kerb also delineates the relevant surfacing. Signage with fingerposts in rural areas and surface marking in more urban areas is important.

##### Routes:

When planning a cycleway route remember that cyclists generally travel for greater distances than pedestrians at higher speed and small detours are not such an anathema to them. Providing the cycleway is smooth, relatively level

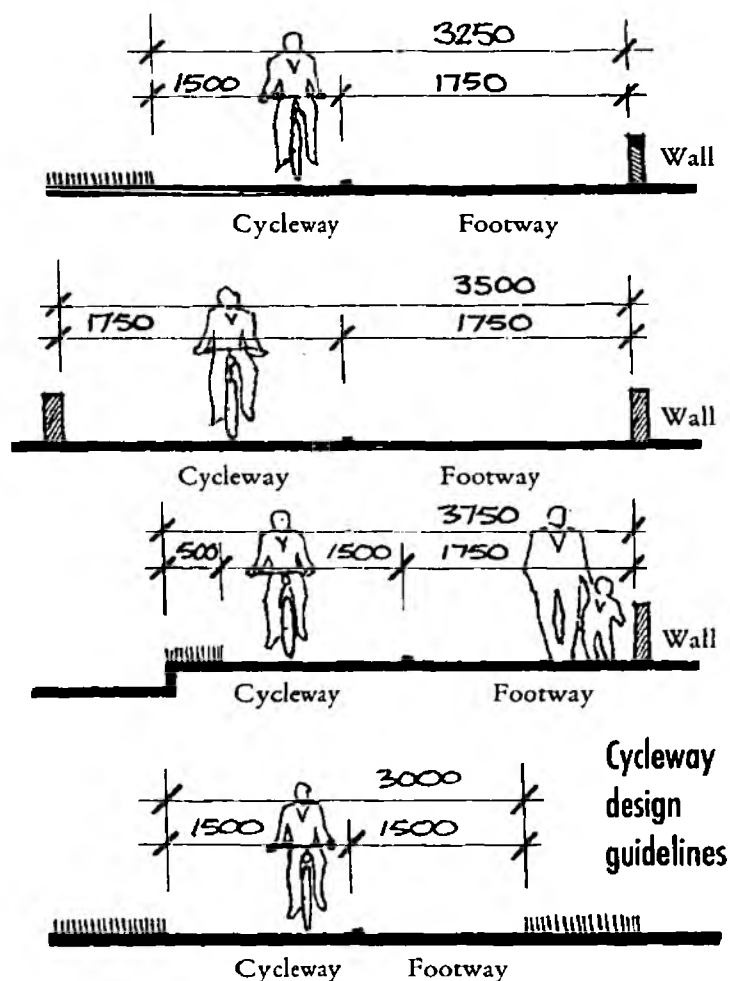
and continuous the cyclist will not generally insist on using the shortest A to B route. Obviously for recreational use a circular route is the ideal.

##### Width:

This must always be related to volume and frequency of use. The standard width for dedicated routes is 2.75m for one-way cycle traffic (min. 2m) and 3.6m for two-way traffic.

##### Gradients:

Maximum gradient for recreational cyclepaths is ideally 1:20 (5%) however a route at a consistently even grade would be a dull experience and the lie of the land should be expressed in the path design.



Source: LUC, Adapted from Sustrans: Paths for people.

## 1.5 SURFACES: BRIDLEWAYS

### 1.5.1 BRIDLEWAYS: DESIGN GUIDELINES

1 OF 2

#### FUNCTION:

A bridleway is a route for horse-traffic ideally serviceable in all weather. In addition to bridleways which are Rights of Way and have a legal status it may on some sites be beneficial to provide other bridleways. By doing this one can funnel horse-traffic away from footpaths/cycleways or vulnerable landscapes where considerable damage could be done.

#### MATERIALS:

The material chosen must be capable of taking the equestrian traffic and should preferably be available from local sources so that sympathy with the local vernacular is ensured. Easy availability of material, for topping up at a later date, is also desirable.

The riding surface should exhibit as many of the following qualities as possible:

- (a) non-slip
- (b) resilient
- (c) well-drained
- (d) require minimal maintenance

A compromise will always have to be made between the quality of surface and the type of material available locally, suitable materials are:

**Hoggin:** laid to a minimum depth of 150mm this is a long-lasting relatively low maintenance surface liked by riders. Only where gravel is available.

**Granular Sub-Base (as DoT type 1 and 2 sub-bases):** graded granular material which compacts to a dense homogeneous mass. Not particularly attractive and relatively expensive, but creates a satisfactory surface.

**Limestone Scalpings:** a satisfactory surface but does deteriorate under continual impact of hooves.

**Sand:** for free-draining sites this is an excellent surface laid to a depth of 75mm, however it is relatively expensive.

**Road Planings:** tarmac particles produced during road resurfacing works, these are readily available from road contractors/highway authorities, and produce a good surface laid at 150mm depth.

**Woodchips:** an excellent riding surface where cost allows, but only suitable for dry conditions, should be laid in a compacted thickness of 225mm.

#### DESIGN:

##### Route:

When planning a route it is important to incorporate a variety of experiences, therefore not all obstacles need to be cleared away and a variety of gradients need to be incorporated. Shallow water should not be considered an obstacle.

##### Delineation:

Signage and the different surface/width of the bridleway will identify it from pedestrian routes etc.

##### Drainage:

The surface of the bridlepath should have a central camber with a gradient of around 1:30 to ensure efficient discharge of water.

##### Width:

Minimum usable width on a bridleway – 3m.

Where it is required to turn a horse (eg. when a gate is to be closed), minimum space required is a diameter of – 2.9m.

Between gateposts (S.145, Highways Act 1980) – 1.5m.

##### Height:

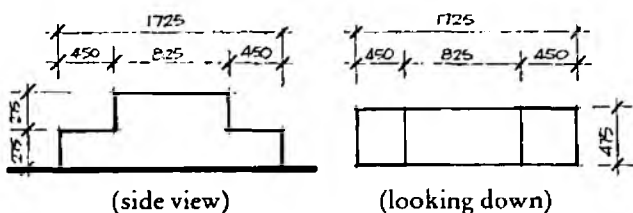
Overgrowth of the sides of a bridleway, byway or road should be cleared to a height to allow a rider to pass.

Where an underpass is constructed minimum height – 3.4m.

## 1.5 SURFACES: BRIDLEWAYS

### 1.5.1 BRIDLEWAYS: DESIGN GUIDELINES

2 OF 2



Suggested designs for mounting blocks

Other design features to bear in mind when planning a bridleway include:

#### Gates:

Should be negotiable from the mounted position. This can easily be achieved by raising the height of the gatepost and upright of the gate and providing a throw-over chain loop. This is easy to manage, adjusts to any slippage of the posts and cannot be opened by animals.

#### Fencing:

Should ideally be of post and rail, or of post and plain wire.

#### Underpasses:

Minimum height 11ft/(3.4m)

Maximum height 10ft/(3m)

When "cattle height" for an underpass is locally agreed as acceptable for riders, they would be expected to dismount, mounting blocks should therefore be provided. There is no specific model for a mounting block, but the steps should be the width of a riding boot's foot length and the block should be capable of being used from each side.

Suggested patterns are shown:

#### Sign posts etc:

Regard should be given to the siting of these and other "street furniture" so that they do not block riders' passage.

#### Consultation:

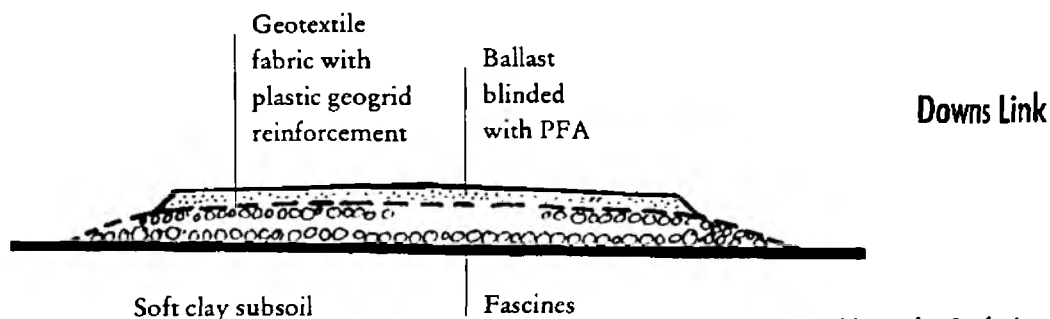
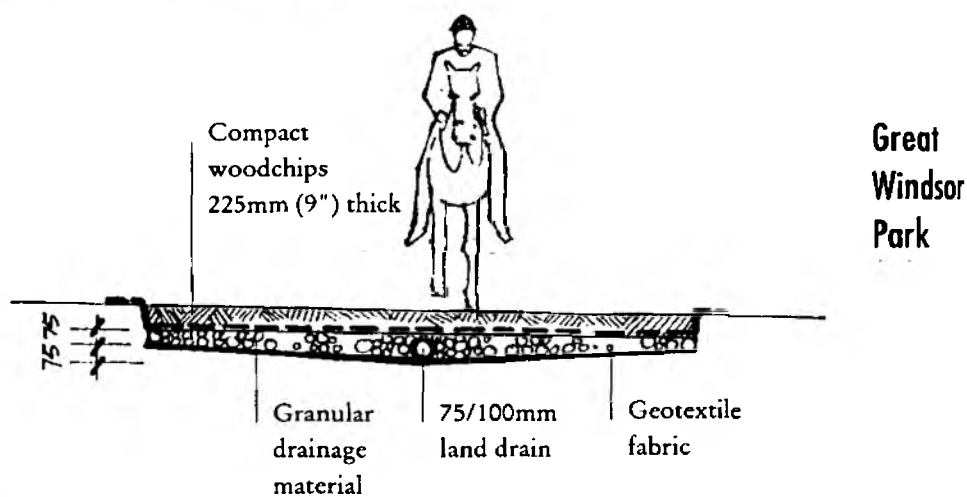
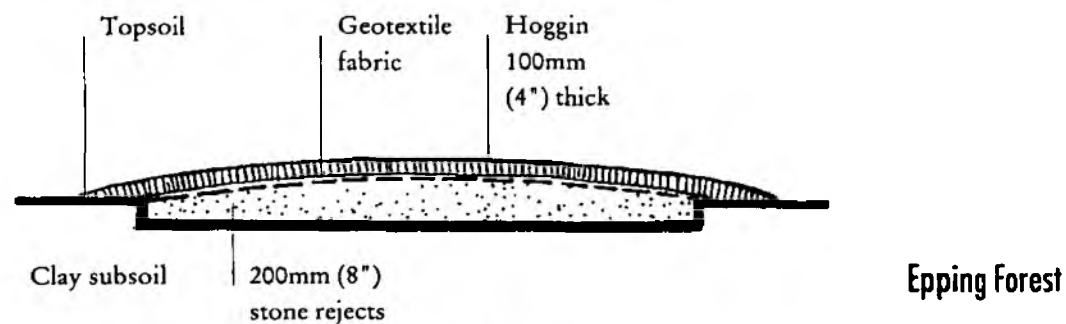
Further advice is available from the British Horse Society and when planning a bridleway or horse path contact either their local representative or a local riding club.

## 1.5 SURFACES: BRIDLEWAYS

### 1.5.2 BRIDLEWAYS: SURFACING

1 OF 2

These are some examples of surfacing that has been used in different situations.

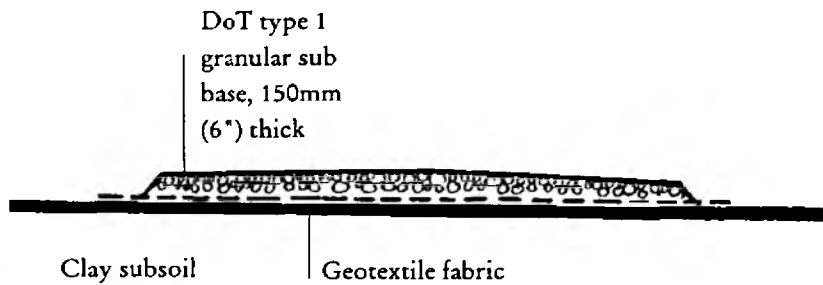


Source: 'A Guide to the Surfacing of Bridleways & Horse-Tracks' BH Soc.

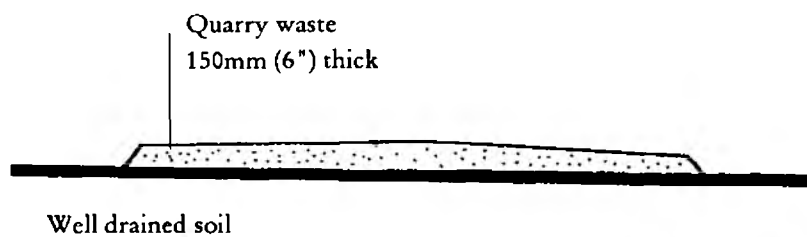
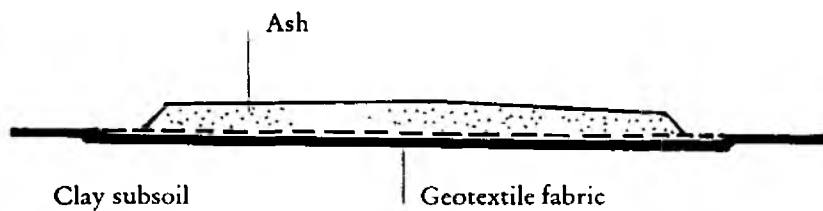
## 1.5 SURFACES: BRIDLEWAYS

### 1.5.2 BRIDLEWAYS: SURFACING

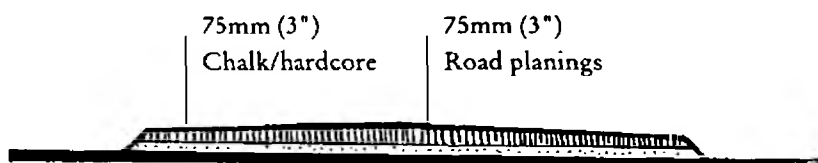
2 OF 2



Br No 191 Shipbourne, Kent

Forestry commission  
construction method

Beeches Farm, Surrey

County Council  
construction method

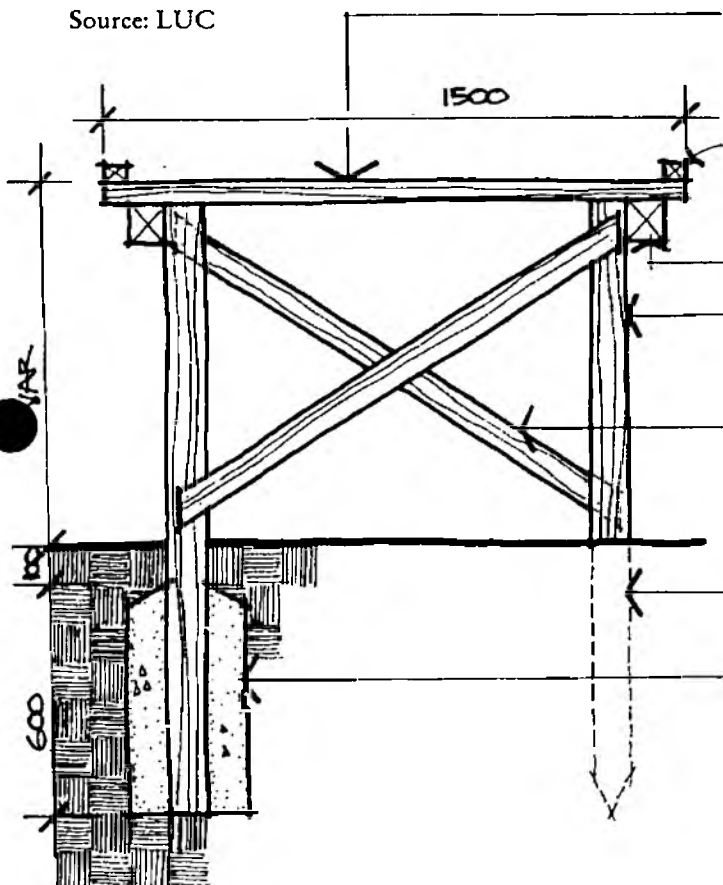
Source: 'A Guide to the Surfacing of Bridleways & Horse-Tracks' BH Soc.

## 1.6 SURFACES: BOARDWALKS

### 1.6.1 BOARDWALK

SCALE 1:20 1 OF 2

Source: LUC



Softwood decking 150 x 50 x 1500mm. Allow 10mm spacing. Fix with 100mm Galv. nails/coachscrews to stringers.

Edge rail 50 x 50 x 2000mm Softwood. Fix with 75mm Galv. Nails.

Stringer 100 x 75 x 2000mm S.W.

Post 100 x 100 x var. mm S.W. (length to vary according to ground level), at 2m centres.

Cross-brace 75 x 38mm S.W. for heights above G.L. in excess of 600mm.

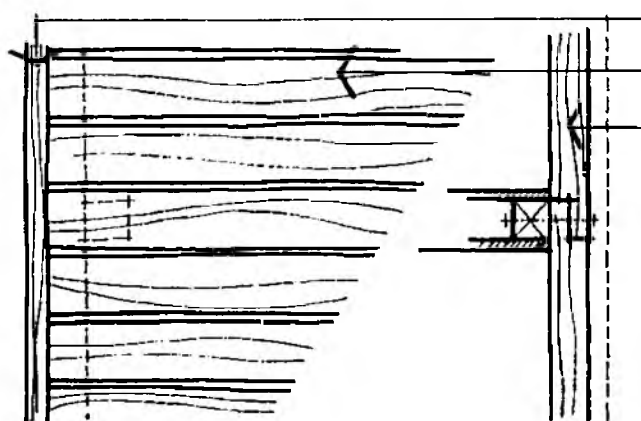
#### FOUNDATION:

A. Post driven into soft ground, pointed end, min. 600mm deep

B. Concrete ST4 mix foundation for firm ground 300 x 300 x 600mm, min. depth.

Support decking between posts with 75 x 100 x 150mm timber brace fixed to posts.

Section



Deck plan

Support structure

#### Edge rail

Softwood deck. You may need to incorporate anti-slip measures.

Stringer lap joint and bolted through at post.

#### IMPORTANT

Softwood timber should be pressure impregnated to BS 1282 (1975) and all fixtures galvanised to BS 729 (1986).

HOWEVER this is not acceptable on nutrient poor bogs of high conservation interest due to leaching of copper and arsenic. In these cases Larch or a Hardwood should be used with non-galvanised fittings.

Refer to: 1.8 Access for all / 2.1 Bridges / 4.1 Fishing platforms

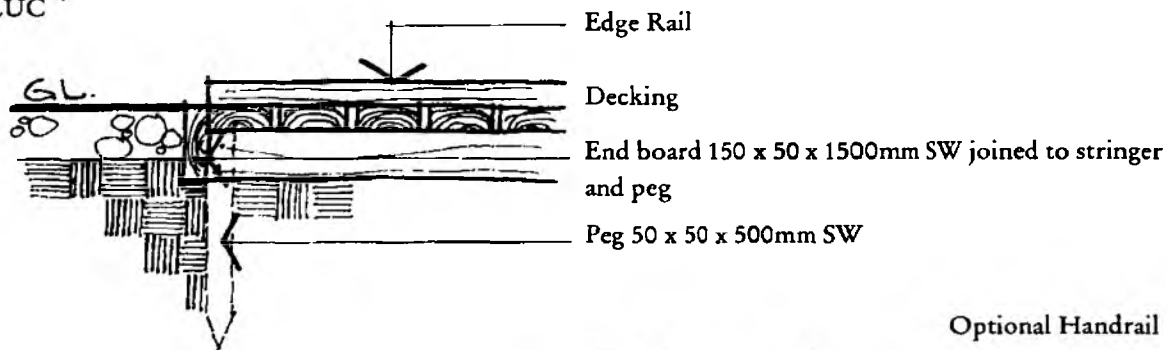
Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
—	•	+	+	+	+	R/S
Low + Medium • High —	Good + Medium • Poor —	Good + Medium • Poor —	Low + Medium • High —	Good + Medium • Poor —	Good + Medium • Poor —	Rural R Semi-rural S Urban U

## 1.6 SURFACES: BOARDWALKS

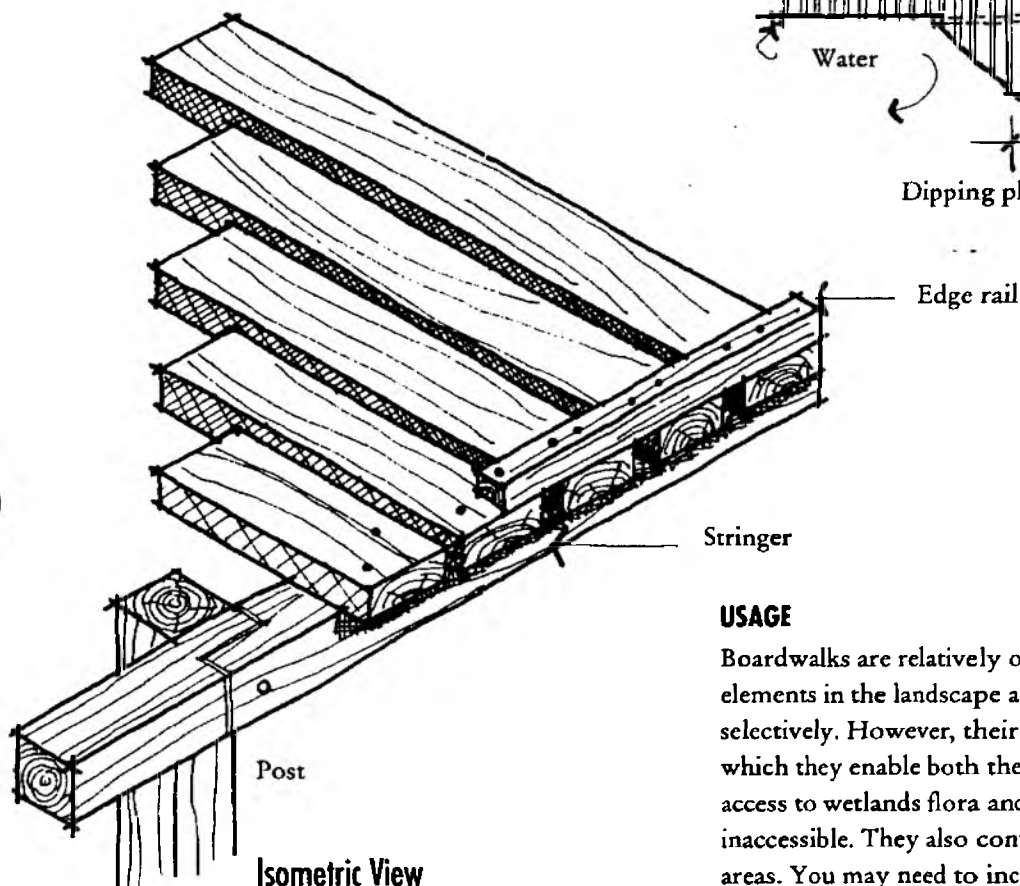
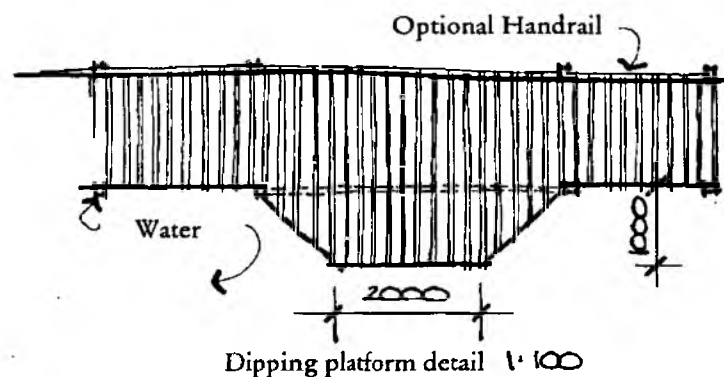
### 1.6.1 BOARDWALK (INCLUDING DIPPING PLATFORM)

2 OF 2

Source: LUC



Detail at end of Board Walk (Scale 1:20)



#### USAGE

Boardwalks are relatively obtrusive and expensive elements in the landscape and should therefore be used selectively. However, their unique quality is the way in which they enable both the able and disabled to gain close access to wetlands flora and fauna which is otherwise inaccessible. They also control access/damage to sensitive areas. You may need to incorporate anti-slip measures.

Refer to: 1.8 Access for all / 2.1 Bridges / 4.1 Fishing platforms

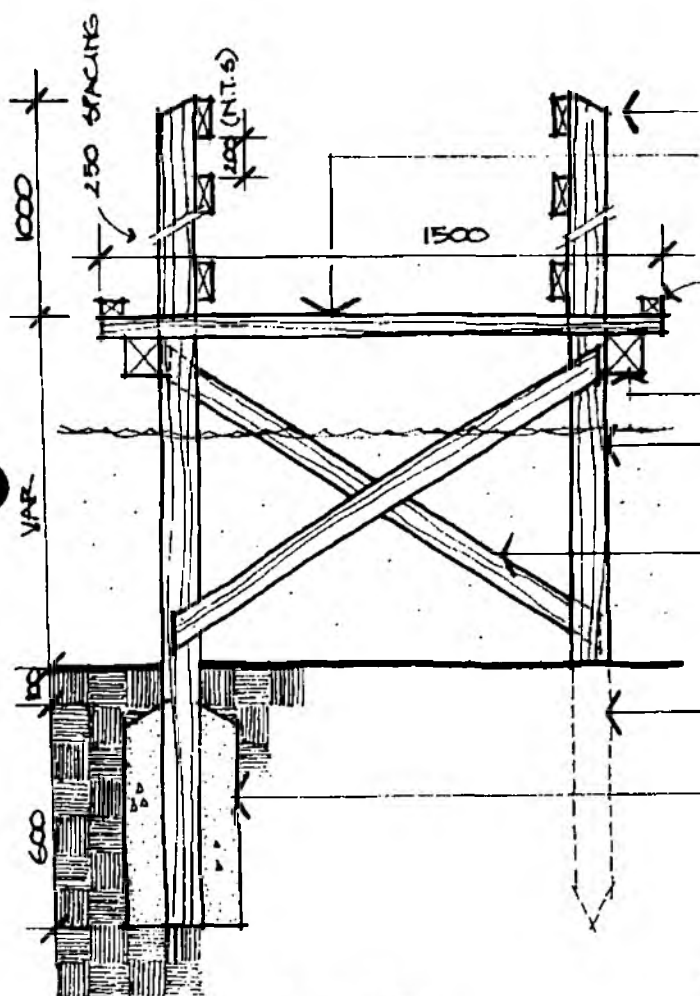
Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
—	●	+	+	+	+	<b>R/S</b>
Low + Medium ● High —	Good + Medium ● Poor —	Good + Medium ● Poor —	Low + Medium ● High —	Good + Medium ● Poor —	Good + Medium ● Poor —	Rural R Semi-rural S Urban U

## 1.6 SURFACES: BOARDWALKS

### 1.6.2 BOARDWALK WITH HANDRAIL

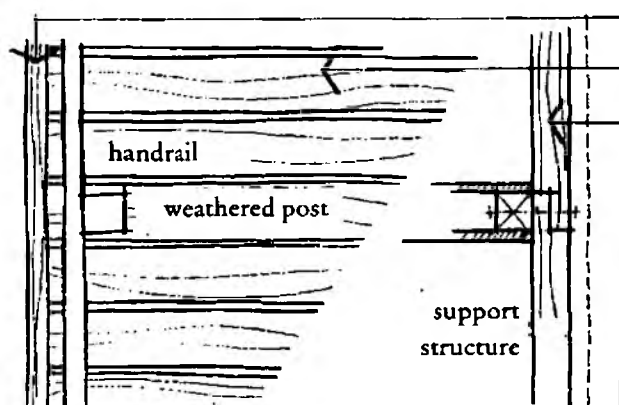
SCALE 1:20

1 OF 2



Section

Source: LUC



Deck plan

Optional intermediate and bottom rail

Top handrail

Softwood decking 150 x 50 x 1500mm

Allow 10mm spacing. Fix with 100mm galv. nails/coach screws to stringers.

Edge rail 50 x 50 x 2000mm softwood. Fix with 75mm galv. nails.

Stringer 100 x 75 x 2000mm S.W.

Post 100 x 100 x var mm S.W. (Length to vary according to ground level), at 2m centres.

Cross-brace 75 x 38mm S.W. for heights above G.L. in excess of 600mm.

#### FOUNDATION:

A. Post driven into soft ground, pointed end, min. 600mm deep.

B. Concrete ST4 mix foundation for firm ground, 300 x 300 x 600mm, min. depth.

Softwood handrail 100 x 50mm with planed radius top and ends. Fix with counter-sunk galv. bolts to post. Post extended through decking for rail uprights. 1 x weathered top to post.

Edge rail

Softwood deck

Stringer lap joint and bolted through at post.

#### NOTES

Use of handrail with only a top rail should be restricted to remote areas where only able-bodied adults are expected.

Refer to: 1.8 Access for all / 2.1 Bridges / 4.1 Fishing platforms

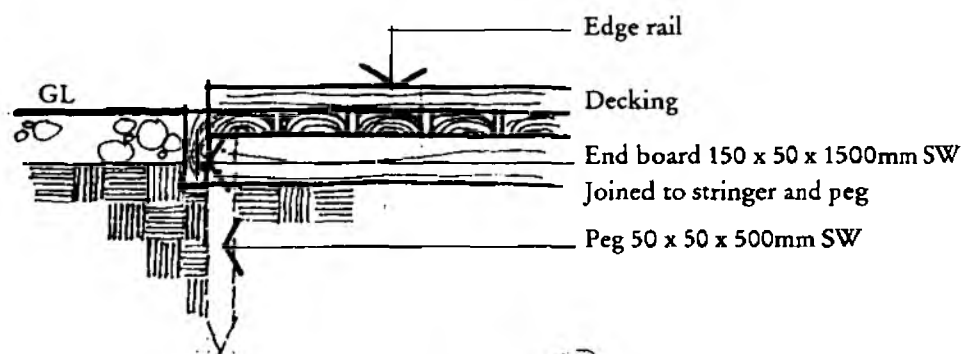
Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
-	•	+	+	+	+	<b>R/S</b>
Low + Medium • High -	Good + Medium • Poor -	Good + Medium • Poor -	Low + Medium • High -	Good + Medium • Poor -	Good + Medium • Poor -	Rural R Semi-rural S Urban U



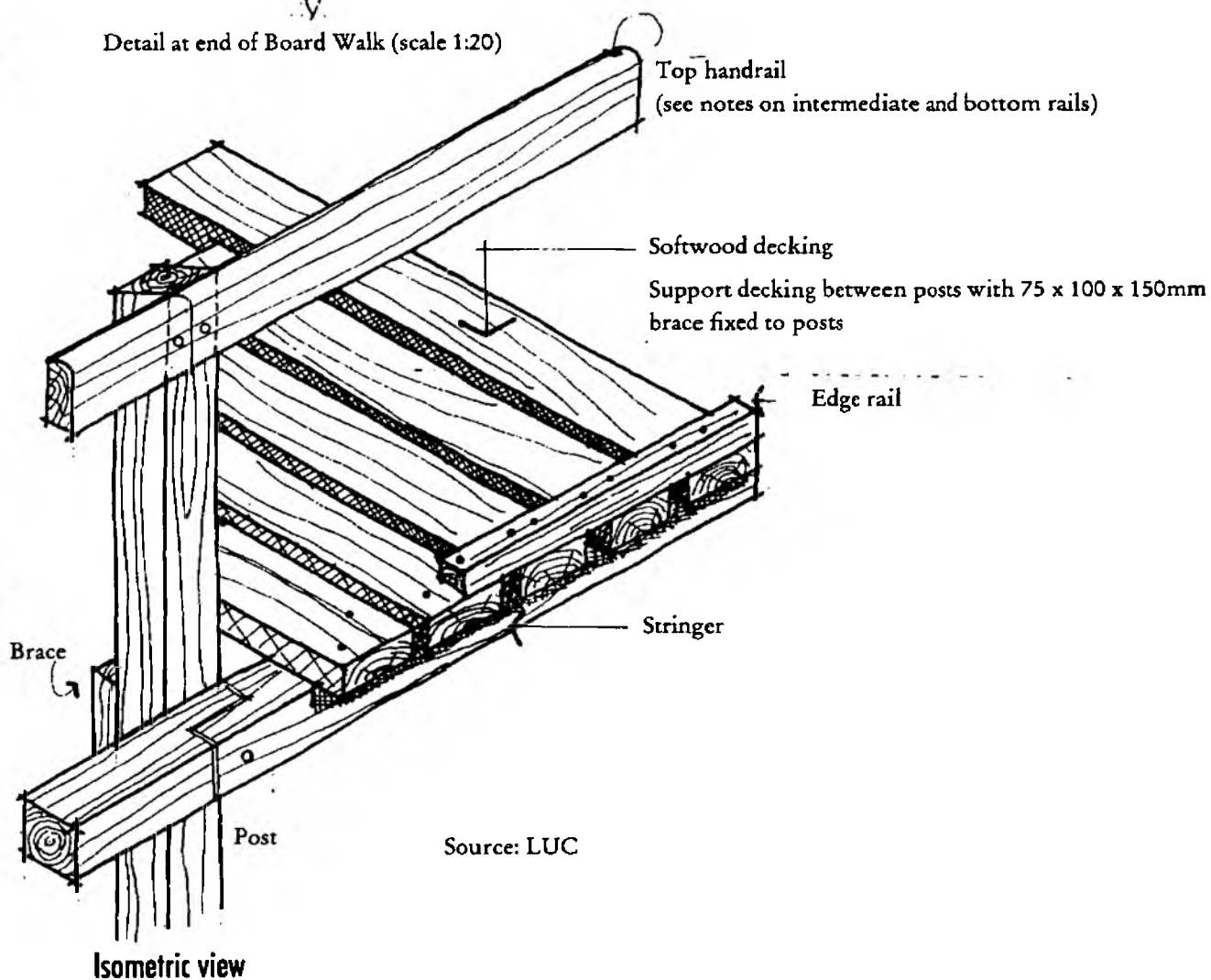
## 1.6 SURFACES: BOARDWALKS

### 1.6.2 BOARDWALK WITH HANDRAIL

2 OF 2



Detail at end of Board Walk (scale 1:20)



Isometric view

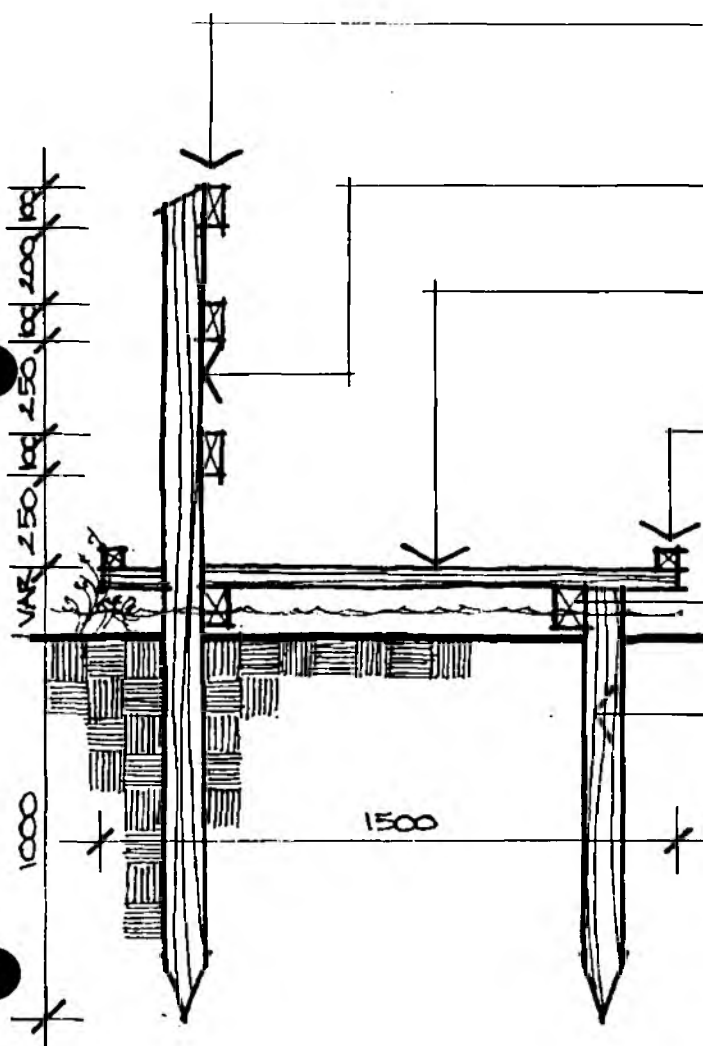
Refer to: 1.8 Access for all / 2.1 Bridges

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
—	●	+	+	+	+	<b>R/S</b>
Low +	Good +	Good +	Low +	Good +	Good +	Rural R
Medium ●	Medium ●	Medium ●	Medium ●	Medium ●	Medium ●	Semi-rural S
High —	Poor —	Poor —	High —	Poor —	Poor —	Urban U

## 1.6 SURFACES: BOARDWALKS

### 1.6.3 BOARDWALK OVER WETLAND

SCALE 1:10 1 OF 1



Softwood rails 100 x 50mm. Top handrail with planed radius top. All ends to be rounded, fix with counter-sunk galv. bolts to post.

Post 100 x 100mm extended through decking for rail upright. 1 x weathered top.

Decking 150 x 50 x 1500mm. Allow 10mm spacing. Fix with 100mm galv. nails/coachscrews to stringers.

Edge rail 50 x 50 x 2000mm fixed with 75mm galv. nails to decking.

Stringer 100 x 75 x 2000mm. Lap jointed and bolted at posts.

Post driven into soft ground pointed end, min 600mm deep.

#### USAGE

Simple boardwalk for crossing sensitive wetlands/marsh or bog areas where pedestrian traffic would cause damage.

#### IMPORTANT

See note on 1.6.1 concerning use of boardwalks to cross nutrient poor bogs of high conservation value.

Source: LUC

Refer to: 1.8 Access for all / 2.1 Bridges

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
-	•	+	+	+	+	<b>R/S</b>
Low + Medium • High -	Good + Medium • Poor -	Good + Medium • Poor -	Low + Medium • High -	Good + Medium • Poor -	Good + Medium • Poor -	Rural R Semi-rural S Urban U

## 1.7 SURFACES: STEPS AND RAMPS

### 1.7.1 STEPS AND RAMPS: DESIGN GUIDELINES

1 OF 1

#### FUNCTION:

Ramps are required where a path has to negotiate a change of level and steps are required if a gradient of 1:12 or shallower is not achievable. Ramped steps can be used on gradients of between 1:12 and 1:4 and offer an excellent way of climbing long hills. Steps and stepped ramps offer enormous possibilities in articulating and creating character in a landscape, but do present an obstacle to the disabled, parents with prams etc. A balance has to be achieved to allow reasonable access for all (see 1.8)

#### MATERIALS:

Materials used at the top and bottom of the steps or for an adjacent retaining wall should dictate the materials used in the steps themselves. Risers and treads do not always have to be of the same materials but should be chosen with care, as steps receive considerable wear, and should not become slippery in wet weather.

#### DESIGN:

The chosen material will dictate the form of the proposed steps and the steps should be used to reinforce the character of a site.

Steps consist of the following elements:

**risers** - should be between 80 and 170mm high and well marked.

**treads** - should be not less than 280mm wide. Each tread should have a fall of 5mm to shed water which may otherwise make steps dangerous, especially in winter.

**landings** - ideally the maximum number of steps between landings should be 12 with the landings being 1-2m wide. However there are many rural locations where this may not be possible, or desirable.

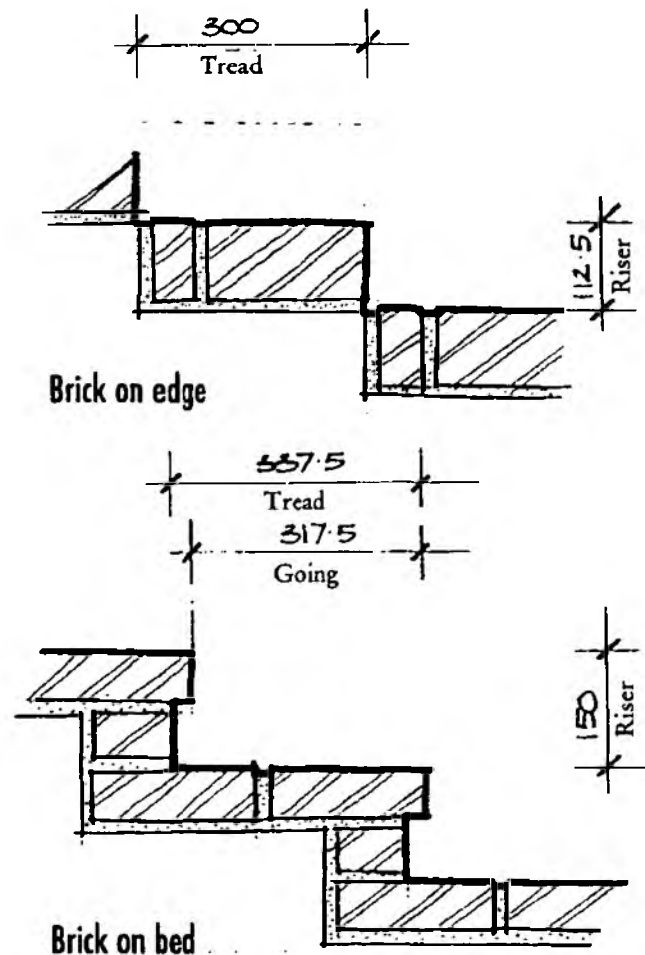
**handrail** - should be provided if extensive use by the infirm is expected or if a drop of over 600mm is present to one side (see 1.7.8).

#### Stepped Ramps:

The ramped sections should have a consistent slope of 1:12 and a dimension of not less than 900mm and preferably 1500mm, thus allowing 3 paces to each tread. Nosings of treads must be defined by change of colour or texture. The riser dimension should not exceed 100mm to allow access for those using prams, etc.

#### Ramps:

Ideally ramps should have a maximum gradient of a 1:12 this being achievable for wheelchairs. Ramp lengths should not exceed 10m, and level landings should be provided at intervals. Surfaces should be non-slip and water shed across and not directly down the ramp.



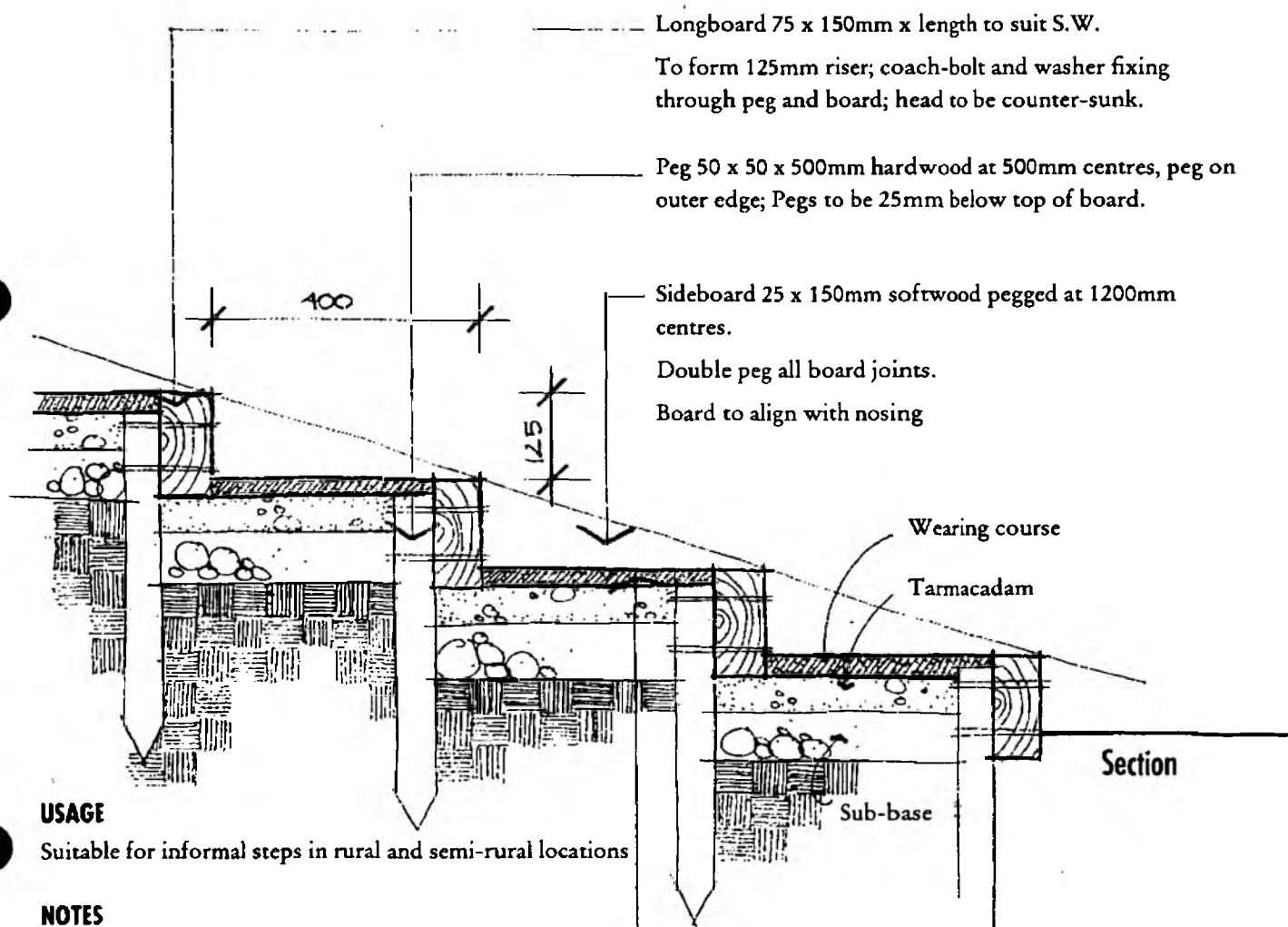
Source: LUC

## 1.7 SURFACES: STEPS AND RAMPS

### 1.7.2 TIMBER AND TAR SPRAY STEPS

SCALE 1:10 1 OF 1

Source: LUC



#### NOTES

Softwood to be pressure impregnated to BS 1282 (1975)

When applying tar spray the exposed areas of timber risers and treads should be masked in order to obtain a cleaner finish.

Tread material may be Hoggins (see 1.7.3) or Ironstone Gravel (see 1.2.3 – Footpaths – for thickness)

Wearing course of 6–10mm gravel spread at a clean rate of 6–8Kg/m<sup>2</sup> nominal thickness 20mm.

50mm Tarmacadam base course in accordance with DoT clause 906 and BS 4987.

75mm DoT type 1 sub-base compacted and laid to falls see DoT clause for material and laying.

Refer to: 1.1.5 Car parks: Tar spray and chip / 1.2.4 Footpaths: Tar spray and chip  
1.3.3 Timber board edge / 1.7.7 Stepped ramp / 1.8 Access for all

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
●	●	+	+	●	–	<b>R/S</b>
Low + Medium ● High –	Good + Medium ● Poor –	Good + Medium ● Poor –	Low + Medium ● High –	Good + Medium ● Poor –	Good + Medium ● Poor –	Rural R Semi-rural S Urban U

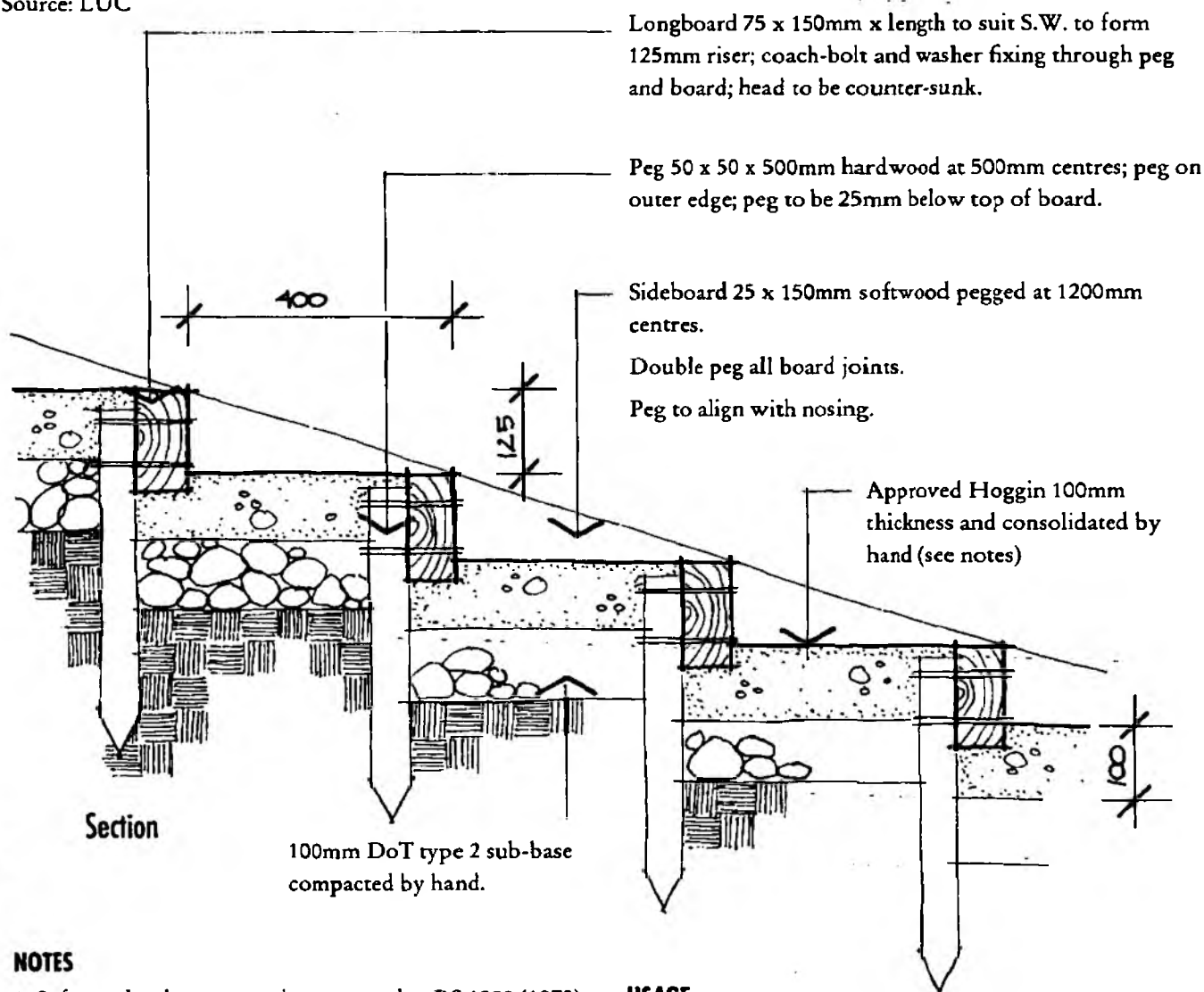
## 1.7 SURFACES: STEPS AND RAMPS

### 1.7.3 TIMBER AND HOGGIN STEPS

SCALE 1:10

1 OF 1

Source: LUC



#### NOTES

1. Softwood to be pressure impregnated to BS 1282 (1975)
2. Tread material may be tar spray and chip or ironstone gravel (see surfaces for thickness)
3. A local equivalent to Hoggin may be available

#### USAGE

Suitable for informal steps in rural locations.

Refer to: 1.1.6 Car parks: Gravel dressed hoggin / 1.2.2 Footpaths: Hoggin

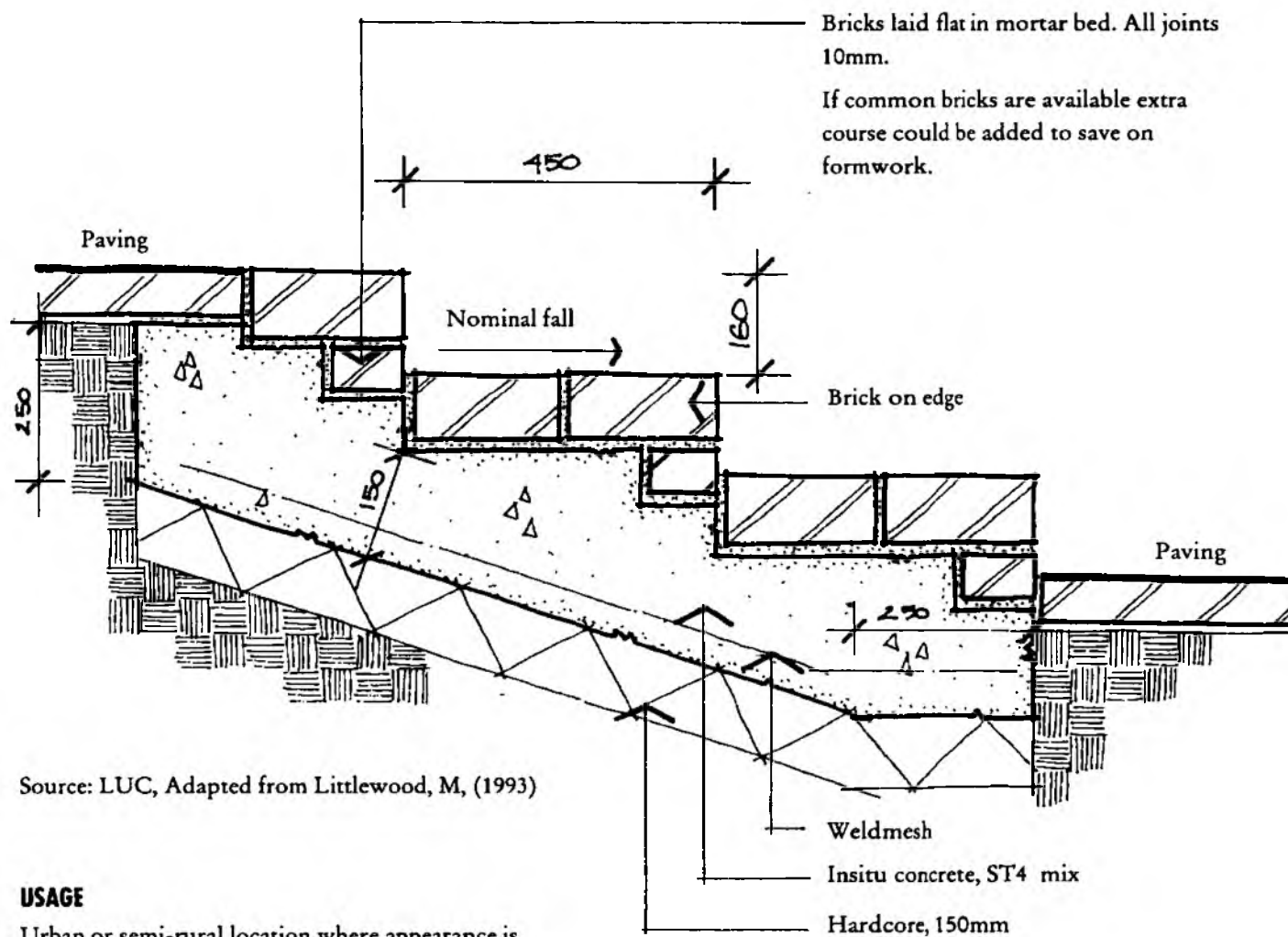
1.3.3 Timber board edge / 1.8 Access for all

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
+	+	●	—	●	—	<b>R/S</b>
Low + Medium • High —	Good + Medium • Poor —	Good + Medium • Poor —	Low + Medium • High —	Good + Medium • Poor —	Good + Medium • Poor —	Rural R Semi-rural S Urban U

## 1.7 SURFACES: STEPS AND RAMPS

### 1.7.4 BRICK STEPS

SCALE 1:10 1 OF 1



Source: LUC, Adapted from Littlewood, M, (1993)

#### USAGE

Urban or semi-rural location where appearance is important or where local context suggests use of all brick steps.

#### NOTES

1. Class A or B engineering bricks to be used or hard stockbricks if some weathering is tolerable
2. Brick type should respect local vernacular
3. Flush joints, 1:4 plain mortar, stack bond

Refer to: 1.2 Footpaths / 1.8 Access for all

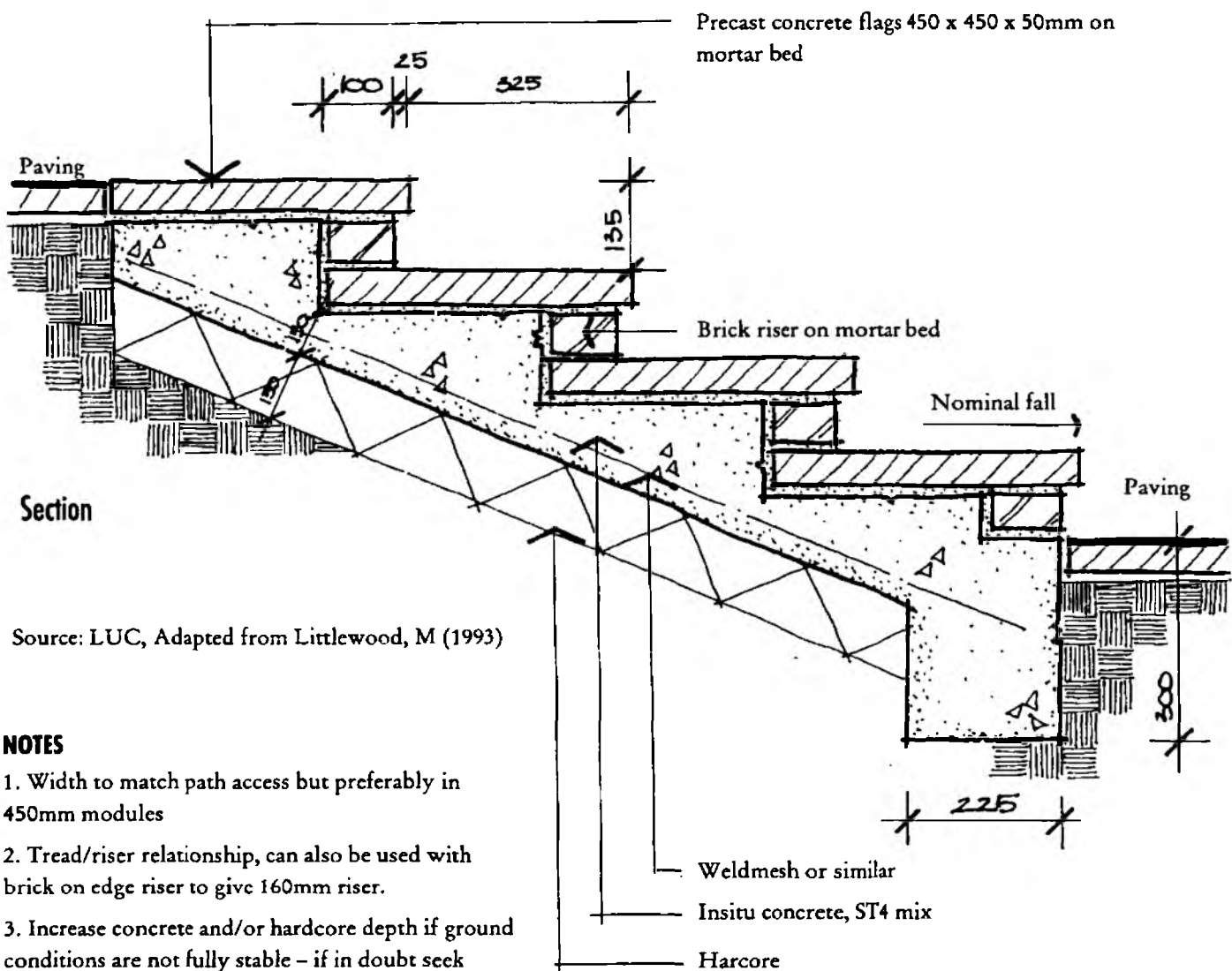
Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
—	—	+	+	●	—	<b>S/U</b>
Low + Medium ● High —	Good + Medium ● Poor —	Good + Medium ● Poor —	Low + Medium ● High —	Good + Medium ● Poor —	Good + Medium ● Poor —	Rural R Semi-rural S Urban U

## 1.7 SURFACES: STEPS AND RAMPS

### 1.7.5 CONCRETE SLAB AND BRICK STEPS

SCALE 1:10

1 OF 1



#### NOTES

1. Width to match path access but preferably in 450mm modules
2. Tread/riser relationship, can also be used with brick on edge riser to give 160mm riser.
3. Increase concrete and/or hardcore depth if ground conditions are not fully stable – if in doubt seek professional advice

#### USAGE

General purpose medium cost steps where better appearance is required.

Refer to: 1.2 Footpaths / 1.8 Access for all

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
●	—	+	+	●	—	<b>S/U</b>
Low +	Good +	Good +	Low +	Good +	Good +	Rural R
Medium ●	Medium ●	Medium ●	Medium ●	Medium ●	Medium ●	Semi-rural S
High —	Poor —	Poor —	High —	Poor —	Poor —	Urban U

## 1.7 SURFACES: STEPS AND RAMPS

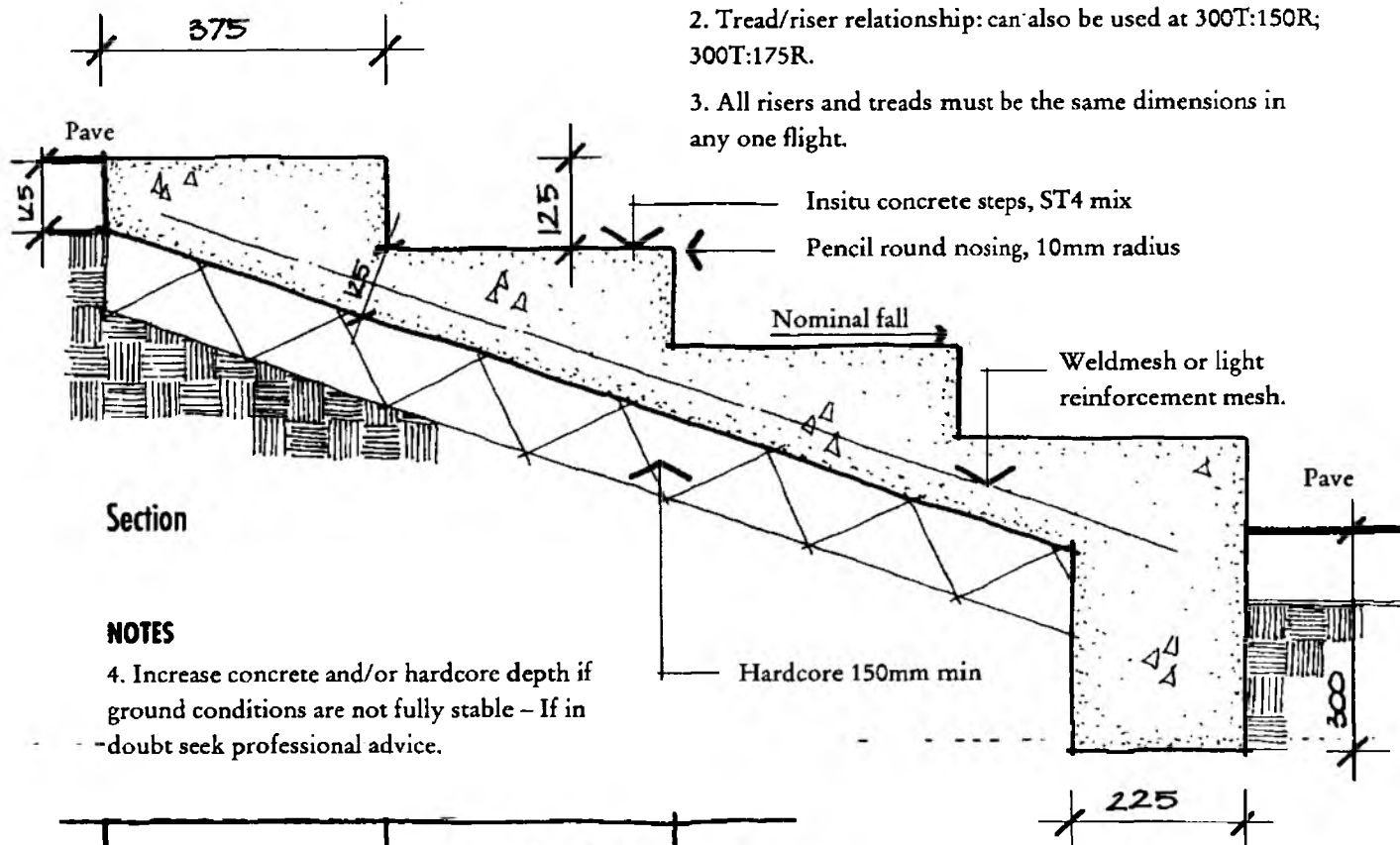
### 1.7.6 IN SITU CONCRETE STEPS

SCALE 1:10

1 OF 1

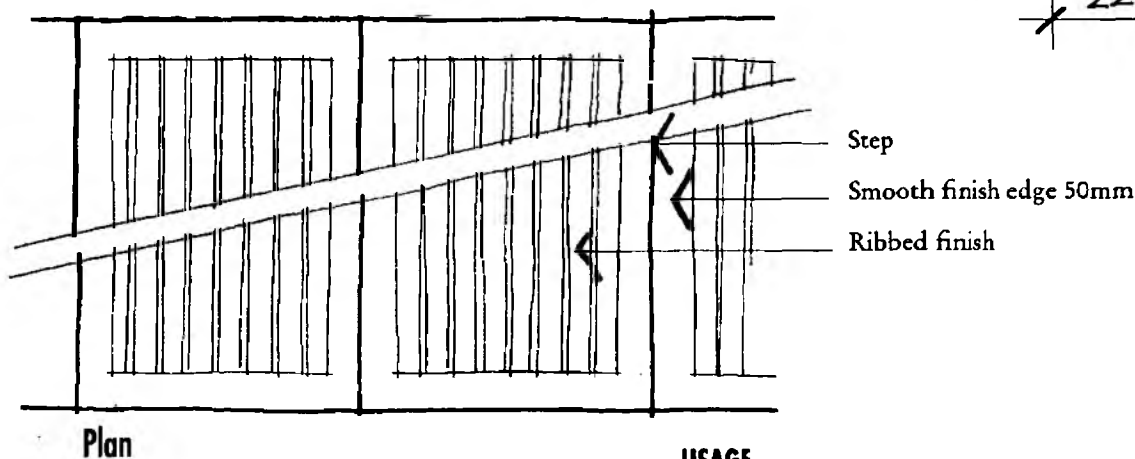
#### NOTES

1. Width to match path access
2. Tread/riser relationship: can also be used at 300T:150R; 300T:175R.
3. All risers and treads must be the same dimensions in any one flight.



#### NOTES

4. Increase concrete and/or hardcore depth if ground conditions are not fully stable – If in doubt seek professional advice.



#### USAGE

General purpose low cost steps where appearance is not critical.

Source: LUC, Adapted from Littlewood, M, (1993)

Refer to: 1.2 Footpaths / 1.8 Access for all

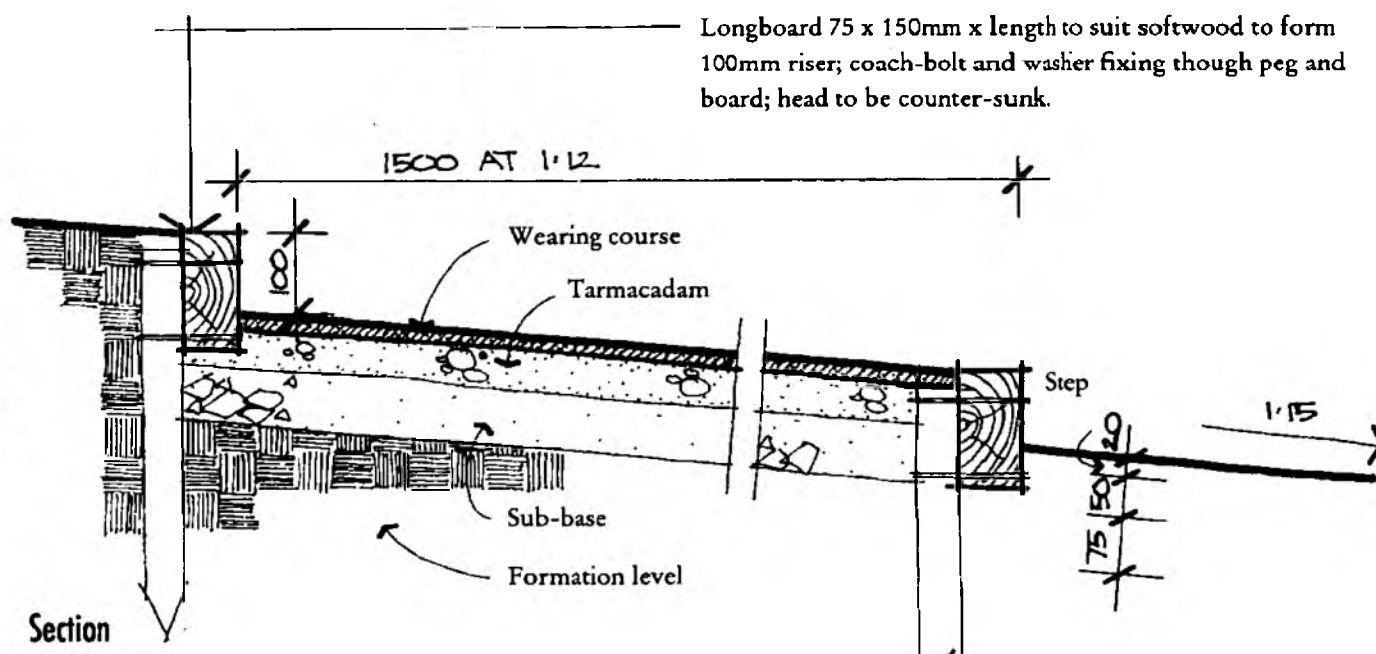
Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
•	–	+	+	•	–	<b>S/U</b>
Low + Medium • High –	Good + Medium • Poor –	Good + Medium • Poor –	Low + Medium • High –	Good + Medium • Poor –	Good + Medium • Poor –	Rural R Semi-rural S Urban U



## 1.7 SURFACES: STEPS AND RAMPS

### 1.7.7 TIMBER AND TAR SPRAY STEPPED RAMPS

SCALE 1:10 1 OF 1



#### USAGE

Suitable for informal stepped ramps in rural and semi-rural locations. To allow easy negotiation by prams/wheelchairs, riser dimensions must not exceed 100mm and tread not less than 900mm pref. 1500mm (as above).

#### NOTES

All Softwood pressure impregnated to BS 1282 (1975)

When applying tar spray the exposed areas of timber risers – and treads should be masked in order to obtain a cleaner finish.

Tread material may be Hoggins (see 1.2.2) or Ironstone Gravel (See 1.2.3) or local equivalent.

Ramp gradient should be 1:12 max and be consistent for entire length.

Peg 50 x 50 x 500mm hardwood at 500mm centres; peg on outer edge; pegs to be 25mm below top of board.

Wearing course of 6 – 10 mm gravel spread at a clean rate of 6-8 Kg/m<sup>2</sup> nominal thickness 20mm.

50mm Tarmacadam base course in accordance with DoT clause 906 and BS 4987.

75mm DoT type 1 sub-base compacted and laid to falls. See DoT clause for material and laying.

Formation level excavated to correct line/level and compacted. Weeds killed and proof rolled with any soft spots excavated material.

Source: LUC

Refer to: 1.1.5 Car parks: Tar spray and chip / 1.2.4 Footpaths Tar spray and chip

#### 1.7.2 Steps: Timber and tar spray

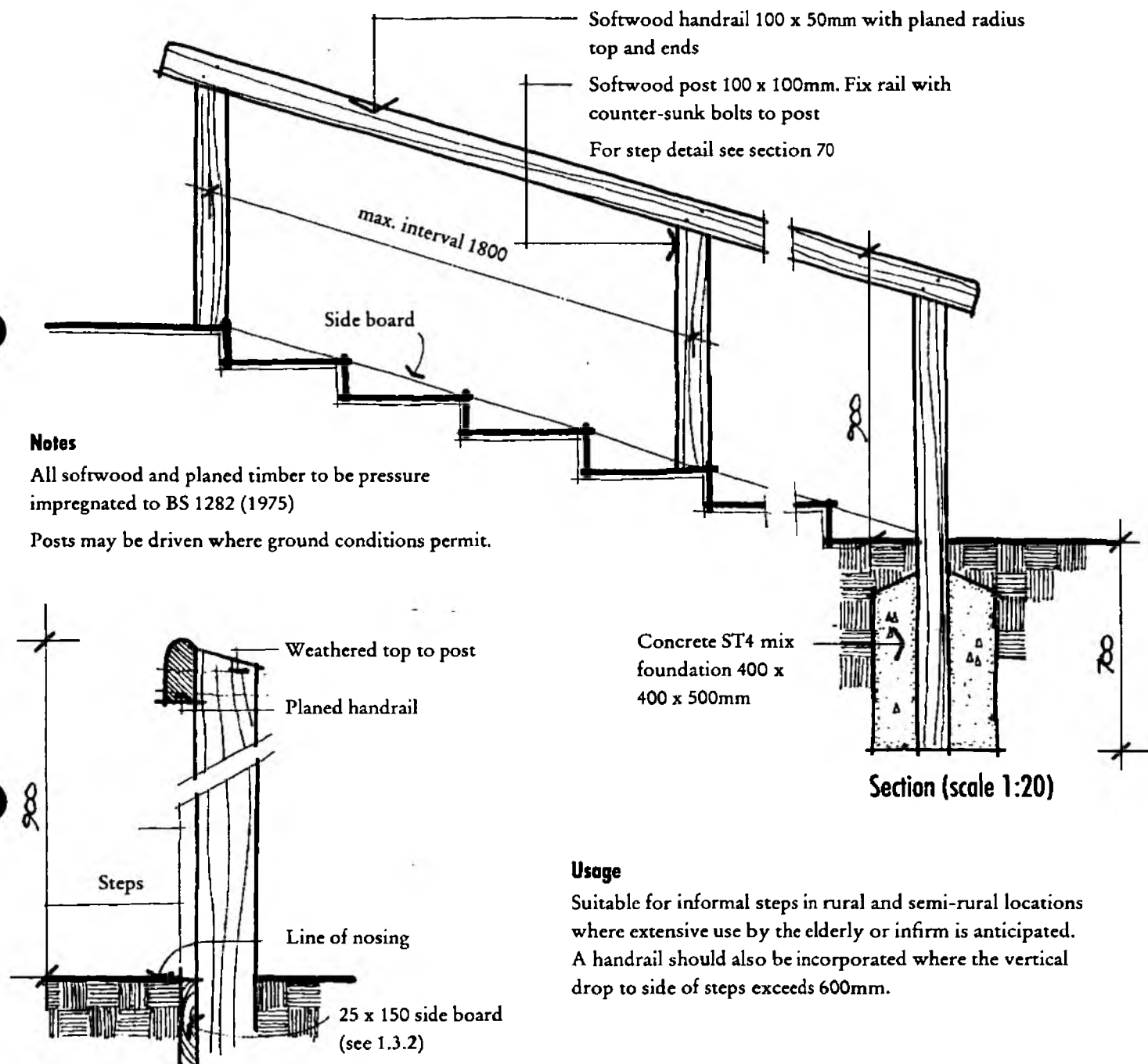
Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
●	●	+	+	●	–	<b>R/S</b>
Low + Medium ● High –	Good + Medium ● Poor –	Good + Medium ● Poor –	Low + Medium ● High –	Good + Medium ● Poor –	Good + Medium ● Poor –	Rural R Semi-rural S Urban U

## 1.7 SURFACES: STEPS AND RAMPS

### 1.7.8 OPTIONAL TIMBER HANDRAIL

SCALE AS SHOWN

1 OF 1



Refer to: 1.7.2 – 1.7.7 Step details / 1.8 Access for all

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
+	+	+	+	+	•	<b>R/S</b>
Low + Medium • High –	Good + Medium • Poor –	Good + Medium • Poor –	Low + Medium • High –	Good + Medium • Poor –	Good + Medium • Poor –	Rural R Semi-rural S Urban U

## 1.8 ACCESS FOR ALL

### 1.8.1 DESIGN GUIDELINES

1 OF 7

When designing new facilities, the aim should be to consider the needs and constraints of disabled users and combine their requirements to provide access and facilities for all. The approach should be comprehensive to be successful and must cover all aspects of a site, from footpaths to site furniture and car parks. Integration of users rather than segregation is preferable although separate, specific facilities may sometimes be needed. Conversely, not all situations are appropriate for adoption for disabled users for example, areas already providing a challenge to able bodied people such as remote and inaccessible countryside.

These guidelines have been divided into two sections. The first section outlines different disabilities and the parameters involved to help provide an understanding of how they will affect a person's use and enjoyment of the countryside. The second section is a checklist of items to be considered when designing facilities suitable for use by disabled people. The guidance notes cover general facilities only, specialist items are covered elsewhere. The guidance notes for wheelchair users can be equally applied for prams and pushchairs. The guidance provided here is necessarily general and is not a substitute for consultation. Suggested references and contacts have been provided in Part C.

#### SECTION A:

##### Ambulant Disabled People:

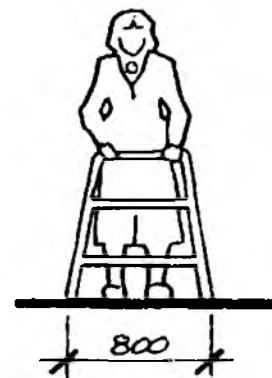
often include people with respiratory problems making long periods of physical exertion difficult. They may be partially paralysed or infirm linked with old age meaning they will be less mobile or flexible. Smooth, non-slip surfaces, ergonomically designed facilities and frequent resting places are all important. Steep gradients, uneven steps and other obstacles should be avoided.

##### Visually impaired people:

include both blind and partially sighted people. Over 75% of these people are also pensioners and therefore may also be infirm. White sticks and long canes used by visually impaired people can detect obstacles in front of them, but cannot identify any obstructions above waist height. Good colour contrasts or clear changes in texture will help to create definitions between different areas. Clear signage will also aid interpretation and enjoyment of recreational areas. Clutter and confusing elements should be avoided and all pathways kept clear.

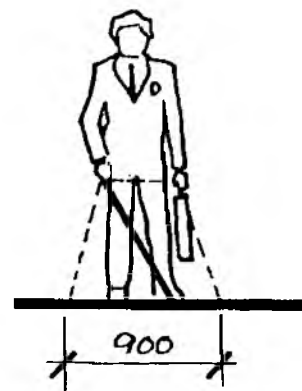


Crutches



Walking frame

##### Blind person using cane

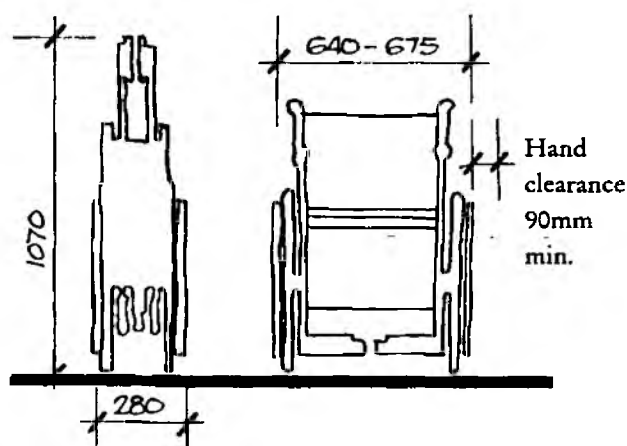
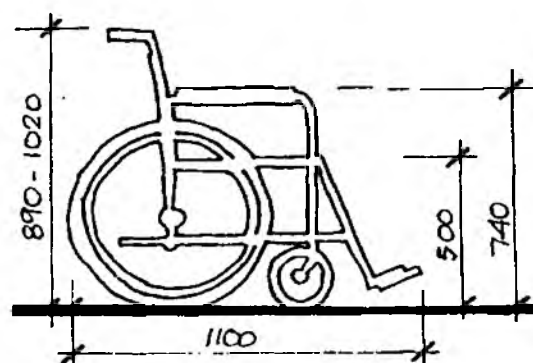


Refer to: 1.1 Car Parks / 1.2 Footpaths / 1.6 Boardwalks / 1.7 Steps and ramps / 2.5 Gates and stiles / 3.1 Seating / 4.1 Fishing platforms / 4.3 Toilet facilities / Part C: Useful organisations

## 1.8 ACCESS FOR ALL

### 1.8.1 DESIGN GUIDELINES

2 OF 7



#### Wheelchair users:

It will not always be the case that people who use wheel chairs are more severely disabled than people who are walking. Many, whose arms are unaffected are extremely mobile and can propel themselves for long distances unaccompanied. Others may need to be pushed. The main difficulties for wheelchair users in the countryside are rough or muddy ground, deep gravel, steep gradients and cambered surfaces and locked or narrow gates and stiles.

#### Deaf people:

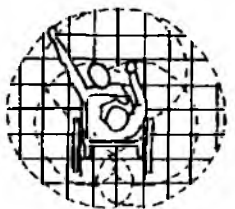
As so much environmental information is visual, deafness may be deemed to present fewer mobility problems than some disabilities. However, traffic noise, signals and hazard warnings, which can be detected only by ear may go completely unnoticed. It is therefore important to ensure that clear visual indication of hazards is also given. Speech problems are often associated with deafness. Signs should therefore be unambiguous and in simple language so that further advice does not have to be sought.

#### People with Learning Disabilities:

Learning disability may also be associated with other impairments such as cerebral palsy and epilepsy leading to a lack of balance and co-ordination, difficulty in movement and an inability to 'order' one's environment mentally. Many of the suggestions already discussed apply equally here but most important is the need to avoid confusion, ambiguity and clutter.



Vertical plane

Horizontal plane  
at floorHorizontal plane  
at waist level

Source: RJ Sorensen,  
Countryside Commission (1994)

(each square measures 200 x 200mm)

## 1.8 ACCESS FOR ALL

### 1.8.1 DESIGN GUIDELINES

3 OF 7

#### Section B: Design checklist

##### Walkways:

Footpaths, flights of steps etc. should be 1.2m minimum width (0.9m minimum between obstacles) or 1.7m to allow wheelchairs and prams to pass. On more informal paths or those less frequently used a 1.2m wide path with passing places may be more appropriate. Pronounced cambers to paths should be avoided with central cambers preferable.

##### Surfaces:

These should be firm, fixed, non-slip and possibly slightly textured. Rough or muddy ground should be avoided and deep gravel or shingle can be especially difficult for wheelchairs. The most appropriate materials are tarmac, asphalt, concrete, bricks, (other than engineering or other non-porous bricks) or paving slabs for more urban contexts and well compacted, crushed rock, gravel or hoggin for more rural locations.

##### Boardwalks and small footbridges:

The same general principals discussed under walkways apply. Access onto a bridge or boardwalk should be level or ramped to a gradient not greater than 1:12. Decking should be laid with gaps of 10mm between them. Non-slip measures may be needed but they should not increase the difficulty of access. Kerbs and bottom rails of hand rails can provide a tapping edge for use by the blind or partially sighted.

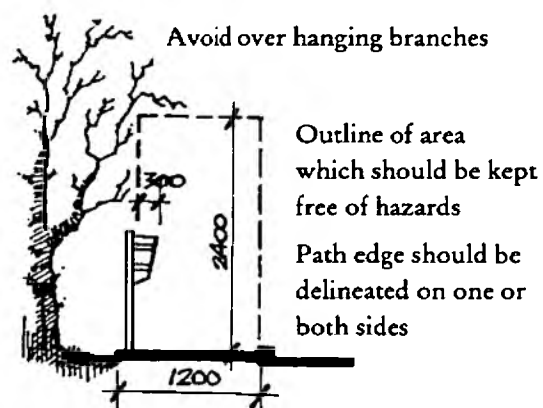
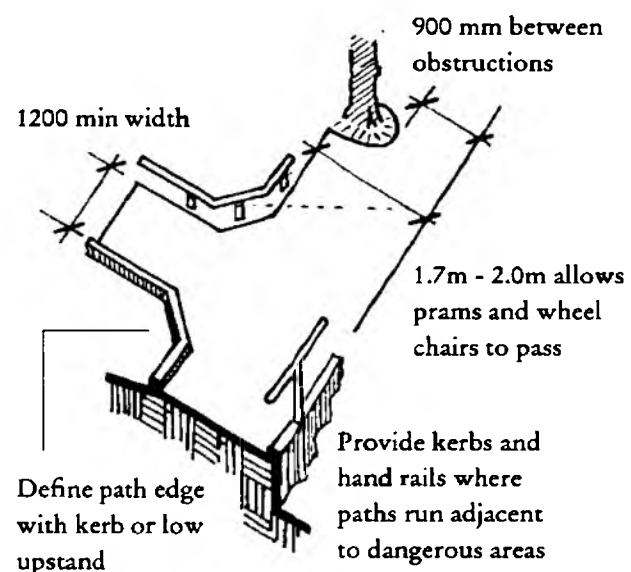
##### Edges:

Edges to paths, ramps etc. should be clearly defined with colour or texture contrasts for visually impaired people. Upstand edges of 100-150mm are useful for wheelchair users and act as important tapping edges for long canes used by visually impaired people. Raised edges are essential where pathways run adjacent to dangerous hazards.

##### Hazards and Obstacles:

Obviously all pathways must be kept clear of obstructions. This includes avoiding single steps or raised manhole covers, gully gratings etc. where possible. All furniture such as seats, litter bins should be set back from the main pathways. No 'obstructions' should extend into the pathway unless their presence can be detected at ground level by a cane.

Where junctions exist or where pathways cross roads for example their presence should be indicated by a change in texture or surface treatment to the footpaths.



Elements which can be detected at ground level may project into the hazard-free area if necessary, but only to a maximum 300mm depth

## 1.8 ACCESS FOR ALL

### 1.8.1 DESIGN GUIDELINES

4 OF 7

#### Drop Kerbs:

These are necessary at road crossings for wheelchair users and infirm people. Gradients should be no greater than 1:10 and width of dropped section should be at least 1.4m. It is also desirable to indicate route across the road by use of contrasting surface. This will also help identify pedestrian crossing points to cars.

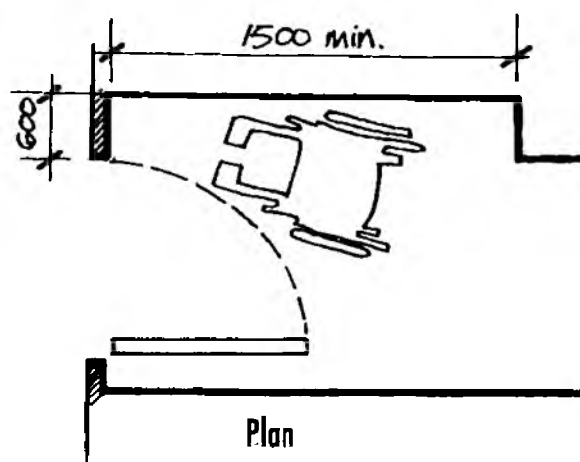
#### Gates and Entrances:

Allow 850mm maximum clear opening. Where gate occurs at end of a confined path allow 600mm of clear space between opening edge of gate and nearest upright restriction to allow wheelchair users to open gate. Latches etc. should be simple and easy to handle and use and set 750-800mm off ground. Lever latch mechanisms are preferable to knobs or handles. The base of gates should have 'kicking plates' to withstand impact of wheelchair users.

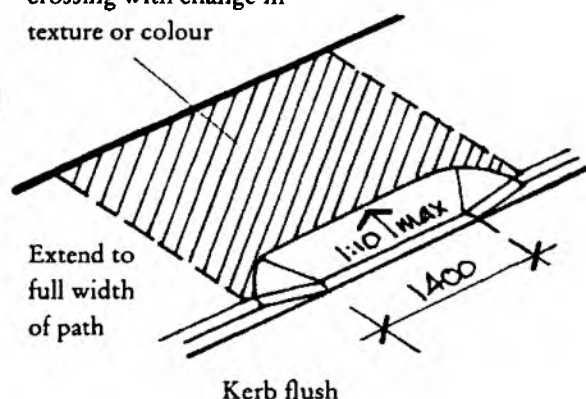
This is especially important where a gate has a self-closing mechanism.

#### Seats and Furniture:

Seats, bins etc. should be readily distinguishable from their surroundings. Seats should not be made of materials that do not retain heat, such as metal. Wood should be planed to avoid splinters. Allow 900mm space at end of seats for wheelchair users to sit alongside.

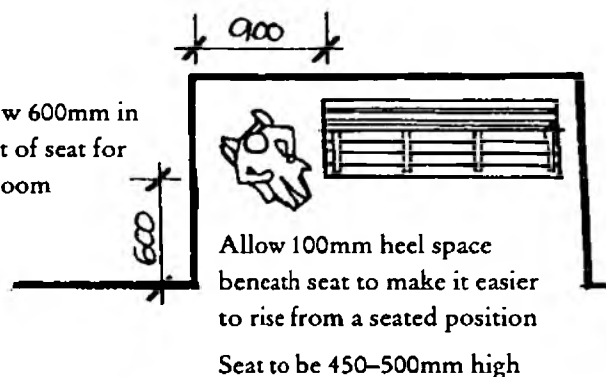


Indicating position of crossing with change in texture or colour



900mm gap allows pram, wheelchair etc. to be parked by seat

Allow 600mm in front of seat for leg room



Plan

## 1.8 ACCESS FOR ALL

### 1.8.1 DESIGN GUIDELINES

5 OF 7

Length of ramp	Up to 3m	3.6m	Over 6m
Ambulant disabled	1:9	1:12	1:12
Independent wheelchair user	1:10	1:16	1:20
Wheelchair pushed by a companion	1:9	1:12	1:20
Electric wheelchairs	1:16	1:16	1:20

#### Ramps:

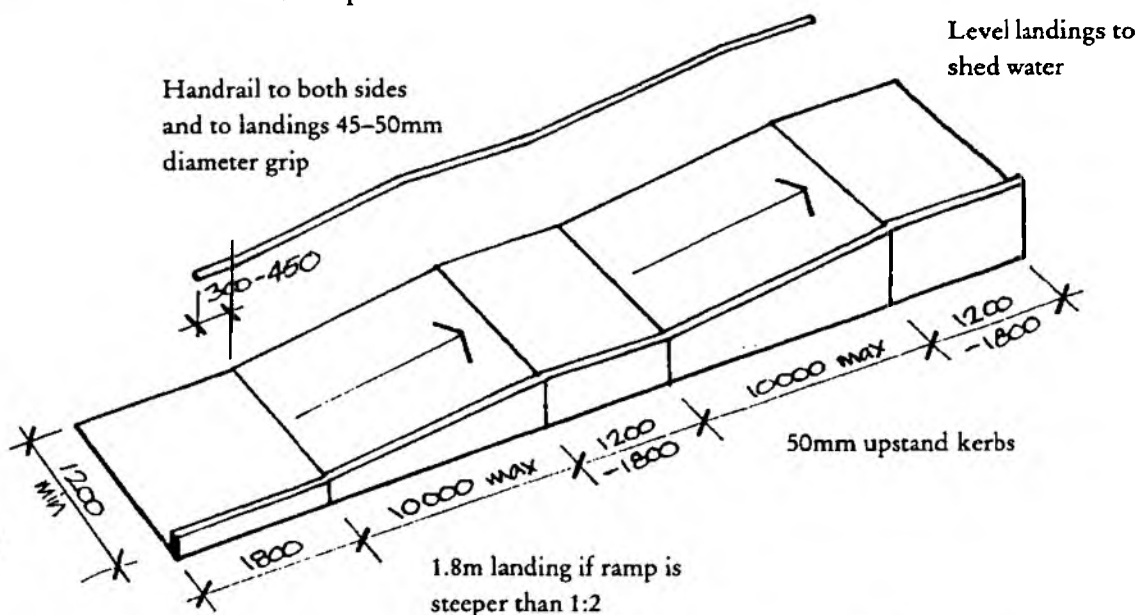
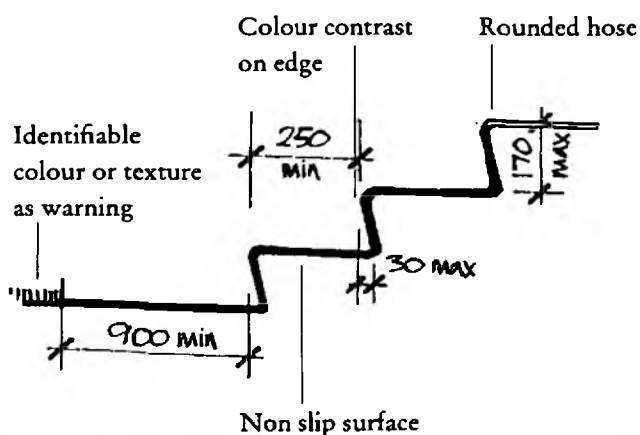
Paths over 1:20 gradient are considered ramps. They should be provided as an alternative to steps, not a substitute (many ambulant disabled people prefer steps to ramps). Maximum gradients depend on length of slope and types of disability. On long ramps a resting platform at 10m (or 800mm vertical rise) is required. This should be 1.2–1.8m length. Level landings are also required, top and bottom. Handrails are required to one or both sides of ramp. Handrails should be 0.9–1m high and/or 0.75m above ground for wheelchair users and children. Where no handrails exist, a 1m level strip should be provided adjacent to path and any potential hazard.

#### Handrails:

These should be smooth surfaced and easy to grasp. Diameter of rail should be 40–50mm.

#### Steps:

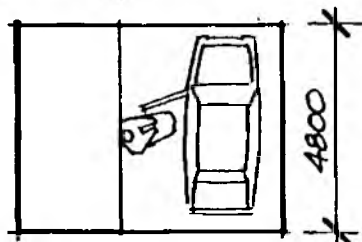
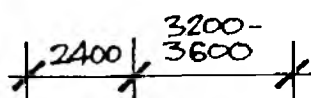
Single steps should be avoided since they tend to create a trip hazard. Otherwise steps suitable for ambulant disabled people should have 280mm minimum length treads and 170mm maximum risers. Nosings should be rounded and any overhang should be less than 30mm. Surfaces should be non-slip with nosings preferably highlighted in a different material or colour. Steps will require handrails set at 750–800mm above nosing height and should extend beyond steps at least 300mm top and bottom.



## 1.8 ACCESS FOR ALL

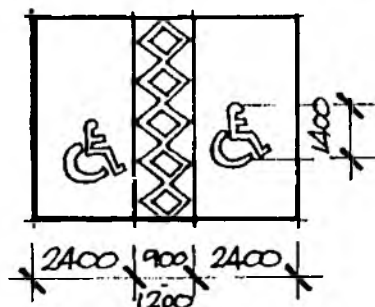
### 1.8.1 DESIGN GUIDELINES

6 OF 7



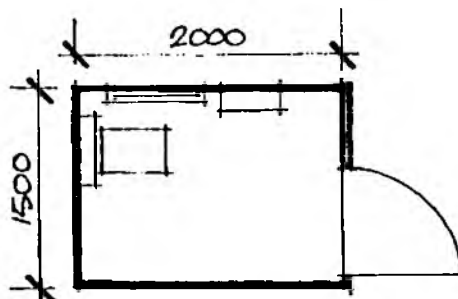
Standard bay  
and wheelchair  
user bay

Plan



Alternative  
layout for  
wheelchair users

Plan



WC cubicle for  
wheelchair users

Plan

#### Car Parking:

Parking represents a major consideration for disabled people and it is essential to provide some special parking spaces. The recommended proportion is one for every twenty standard spaces, but as a minimum every car park should have two wide spaces (3000–3600mm x 4800mm). Marking the bays with the international disability symbol will help to prevent it being used by others. In addition, car spaces for disabled people should be sited where there is level access to adjoining footpaths and ideally a distance of not more than 50 metres from the facility. If the distance is greater than this then seats or 'perches' should be provided at regular intervals or a drop-off point provided nearer the facility.

#### Toilets:

Toilet facilities can constitute a major problem for disabled people. It is best to seek expert advice but the Centre for Accessible Environment's publication "Designing for Accessibility - an introductory guide" is a good starting point.



International symbol  
of accessibility

Source: S Goldsmith



## 1.8 ACCESS FOR ALL

### 1.8.1 DESIGN GUIDELINES

7 OF 7

#### Standard eye level height

Adult male: 1625mm

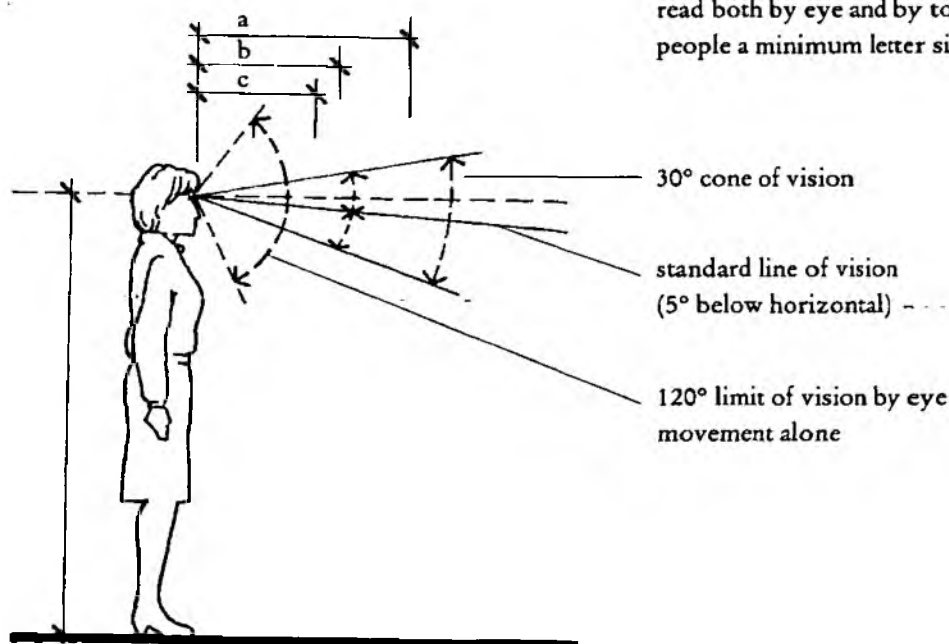
Adult female: 1525mm

Child, 6–10 yrs: 1016–1143mm

Child, 11–15 yrs: 1270–1525mm

NB children's eye level heights vary greatly, these are only guidelines.

- a: maximum normal reading distance: 737mm
- b: good reading norm, 508mm
- c: minimum comfortable reading distance: 406mm



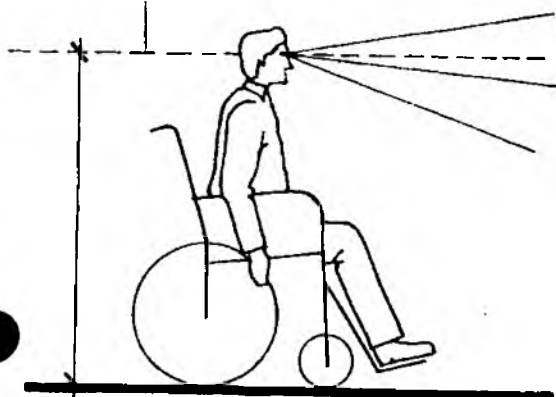
#### Signage:

The use of signage should be kept to a minimum and used only where necessary to impart information. They should be clearly located and set back from main pathways. They should be set approximately 1.5m above ground level to be read by both ambulant people and wheelchair users. A grip rail beneath the sign or perch seat may help infirm users. For visually impaired people, the greater the colour contrast between the writing on a sign and its background the more easily it can be read. Raised or inscribed lettering, diagrams and maps are also helpful. It is important to consider the size of lettering, large print being easier to read both by eye and by touch. For partially sighted people a minimum letter size of 18 point is recommended.

#### Average wheelchair seated eye level:

Adult male: 1219mm

Adult female: 1115mm



Source: Countryside Commission (1994)

## 1.8 ACCESS FOR ALL

### 1.8.2 DISABLED FACILITY CHECK LIST

1 OF 2

A first step towards providing a 'barrier-free' environment might be to ascertain just how accessible the existing countryside is to disabled visitors. The following checklist, based on one compiled by the Disabled Living Foundation, might help to assess this.

#### GENERAL:

- Is the site accessible to wheelchairs?
- Is there an easily-seen plan of the site at the car park or visitor centre?
- Are walks that are capable of being taken by disabled people shown on the plan or in some other way?
- Are audio or touch maps and guides available?
- Are closing times clearly indicated?
- Can a wheelchair or other vehicle be hired or borrowed and is prior notice necessary?
- How many facilities are accessible to a disabled person, whether blind, in a wheelchair or with limited walking ability (for instance refreshments, visitors, gardens, nature trails, aviaries)?

#### CAR PARKING:

- Is the access symbol displayed on some reserved spaces?
- Are spaces accessible and wide enough for door to open fully on either side of the vehicle?
- How close is the car park to the facility served eg. visitor centres, toilets, trails, places of special interest, walks, etc?

#### SHELTERS:

- Are shelters provided against inclement weather and are these accessible to disabled people?

#### FOOTPATHS:

- Are there paths without steps?
- Is the path wide enough? Have passing places been made for wheelchairs on narrow paths?
- Are cambers reduced to the minimum?
- Are ramps and handrails provided where necessary?
- Are rest benches or other forms of seating provided alongside longer or sloping paths?

#### SURFACES:

- Are the surfaces of some paths level and smooth and free from clutter and blockages to help those with wheelchairs and walking aids?
- Are the edges clearly defined?
- Is there any guidance available for blind people by means of tapping rails or distinctive surface colour and texture?

#### KERBS:

- Have kerbs which have to be crossed been removed where possible and ramped?
- Are kerbs provided where necessary for safety and guidance?

#### STEPS:

- Are steps safe?

#### RAMPS:

Is the gradient of ramps too steep?

#### GATES AND STILES:

- Could a person in a wheelchair get through or round the gates and stiles provided?
- Can people with difficulty in walking negotiate the stiles?

#### SEATS:

- Are seats at a suitable height with arms and backrests? Are "perches" provided?
- Are they situated at interesting and accessible places?

#### PICNIC TABLES:

- Do tables allow for a person in a wheelchair to sit at them?

#### TOILETS:

- Is there a toilet cubicle suitably designed for wheelchair users?
- Are toilets kept locked, and if so where is the key kept? Do locks comply with RADAR's National Key Scheme?
- Do notices indicate the location of toilets, and are they reasonably close to parking facilities?

## 1.8 ACCESS FOR ALL

### 1.8.2 DISABLED FACILITY CHECK LIST

2 OF 2

#### PLANTING:

- Do the species of plants used play on more senses than just sight?

#### SIGNS:

- Is information conveyed in a simple, clear way, in contrasting colour and in large print for those with poor vision to read?
- Are they low enough for a person in a wheelchair to see?
- Has any method been used to convey information to blind people?

#### PUBLICITY:

- Are relevant local associations, services, television, radio and newspapers (including talking newspapers) informed of the facilities available?
- Could more be done to make the facilities known to disabled people in the area?

#### TRANSPORT:

- Is transport available to enable people who may otherwise be house-bound to make use of facilities for countryside recreation?

#### TAKING ACTION:

Having established what needs to be done to make the site more accessible and using the information given in this manual and other sources listed in Part C steps can now be taken to put ideas into action. The following hints show how this can be done:

- Begin with a check of disabled people in the catchment area, to see whether there is any type of disability that should be catered for. Is there a special school or residential centre in the vicinity? The local social services department will assist here.
- Initiate and maintain contact with local clubs, schools and associations for disabled people, and enlist their help and advice.
- For large jobs and buildings, enlist the services of an architect - one of the disability associations listed in Part C may be able to advise about those with experience of designing for disabled people. Smaller tasks can easily be undertaken by unskilled, even voluntary labour.

#### PUBLICITY AND PROMOTION:

The final, but important step, is to publicise your facilities. It is vitally important to ensure that as many people as possible, particularly locally, know about your services, where they are and where further information can be obtained from if they want to find out more.

#### Contact:

- the social services department in your own and neighbouring areas;
- any local clubs or organisations for the disabled.;
- local newspapers and radio stations, including talking newspapers;
- tourist boards and tourist information centres;
- national organisations for the disabled (Part C) who can distribute information to their branches throughout the country;
- BBC radio programmes for blind and disabled people that reach a wide audience and provide an important information exchange.

None of the facilities for disabled people described in this manual debar use by the abled-bodied; the converse is sadly, seldom true. With a little thought, consultation and imagination, it is possible to create a countryside that can be enjoyed, not just by those lucky enough to be in perfect health, but by a far larger number of people who had previously been ignored



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## PART B

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### 2.0 STRUCTURES

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2.0 STRUCTURES



NRA

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## 2.1 STRUCTURES: BRIDGES

### 2.1.1 BRIDGES: DESIGN GUIDELINES

1 OF 2

Footbridges have an obvious purpose and for this reason are frequently ignored as purely function objects. In most cases a footbridge is only a means of getting somewhere else, occasionally the obstacle, and its spanning is of interest. The visual accent which a footbridge can contribute to the landscape is often not achieved, this section aims to set out the aspects for consideration.

Professional design advice should always be sought on the design of bridges (and their foundations).

**CRITERIA** to be considered when choosing site and design:

- **who will use the bridge?** people, (in what sort of numbers) disabled people, cyclists, riders on horseback, motor-cyclists, vehicles (what size/weight), and livestock? As well as considering the necessary loadings, one must consider unplanned use by motor-cyclists, livestock etc. and plan to prevent it. Also who will require clearance below the bridge? is the bridge necessary? is a detour possible around the watercourse, or would stepping stones suffice (the latter being of no use to the disabled).
- **is the bridge necessary?** is a detour possible around the water course, or would stepping stones suffice (the latter being of no use to the disabled)
- **where is the best location?** if the bridge is necessary where is the shortest span and the best foundation conditions, which location gives the best access for all, which location gives the best flood clearance?
- **what resources are available?** what is the budget, are materials, plant and labour available, is a planning and design service available?

#### **PROCUREMENT:**

Once it has been decided to go ahead with a bridge, there are 3 basic methods of procurement:

- for small rural spans construct the bridge using locally available wood and/or secondhand materials;
- also for small spans purchase a self assembly kit bridge of the right appearance, these are available in sizes up to around 9m.
- commission a specially designed bridge, for spans of over 9m a designer must be consulted.

#### **DESIGN:**

The design of a footbridge will have to be determined with knowledge of the site character, span requirement, foundation conditions, construction costs and maintenance available. The following is a selection of widely used designs:

- **simple beam or slab** – versatile and relatively cheap, can be all timber or with steel beams and timber deck/rails;
- **continuous beam or slab** – similar to above design but is capable of much larger spans, up to 20m.
- **propped beam or slab** – suitable for spans up to 25m and could be utilised as a visual accent within a masterplan design.
- **cable stayed** – good solution for long spans (up to 35m) with only one intermediate pier required. Design is complex and will require professional advice from an experienced engineer. As above, an excellent visual accent.

## 2.1 STRUCTURES: BRIDGES

### 2.1.1 BRIDGES: DESIGN GUIDELINES

2 OF 2

Once the technical aspects have been considered it is vital that the more aesthetic points are not forgotten:

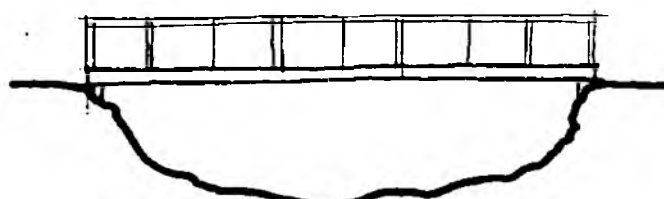
- relationship to the footpath: a bridge should form an extension to the footpath. Consider access for all;
- design of the footpath: how will the surface of bridge and path relate?
- colour: when using timber the rich earth colours of hardwood and preserved softwood are recommended. Observe the local vernacular and design to suit, in some areas white painted handrails are typical and punctuate the scene;
- good workmanship: is vital, prefabrication is recommended where only unskilled labour is available for erection;
- abutments: consider how these will be treated, a fine bridge can be ruined by unsympathetic treatment of abutments.

#### CONSENTS:

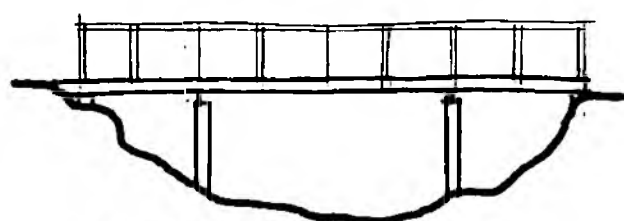
must also be considered:

- pedestrian footbridges generally require planning permission, contact the local planning authority for advice;
- for all stream and river crossings an assessment of the likely flood levels must be made, and the footbridge constructed to survive these.

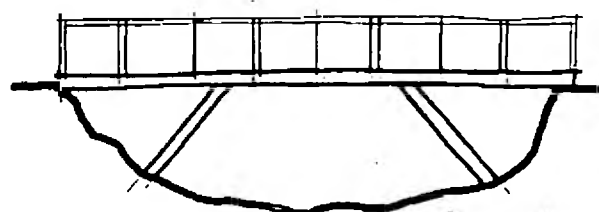
#### Bridge elevations



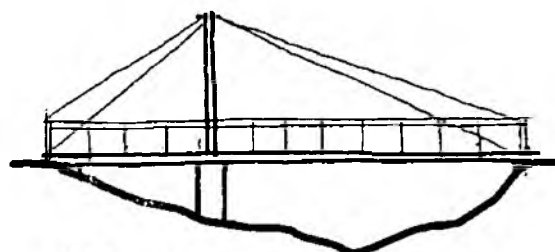
Simple beam or slab



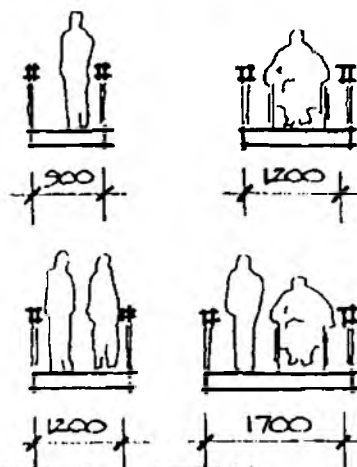
Continuous beam or slab



Propped beam or slab



Cable stayed



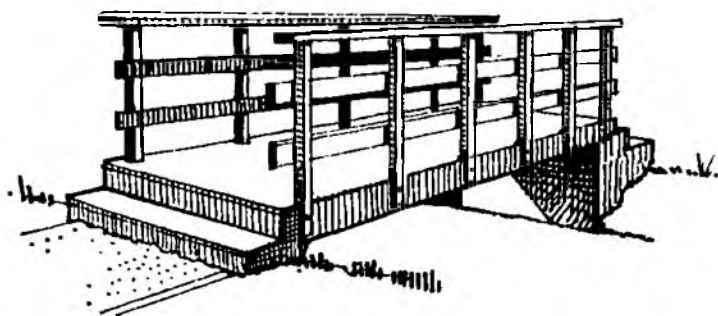
Source: LUC

Bridge widths

## 2.1 STRUCTURES: BRIDGES

### 2.1.2 KIT BRIDGES

1 OF 1



#### LENGTHS

Kit bridges are generally available in lengths of about 2.7 metres up to about 9 metres

#### WIDTHS

These can vary from 450mm to 2400mm but other widths may be available upon request.

#### MATERIALS

Many kit bridges are made from tropical hardwoods and it is advisable to check the source and ensure that it meets the requirements of the NRA's environmental policy.

#### FIXING

Concrete or Timber abutments details required at either end, although for smaller bridges foundations are not necessary needed.

#### USAGE

Suitable for rural /semi-rural locations. Black or dark stained timber bridges should be used in urban sites.

#### NOTES

Provided bridges are of suitable appearance and size kit bridges are a relatively low-cost solution. No skilled labour is necessary to erect kit-bridges and kits are relatively easy to position even in areas with restricted access.

Refer to: 1.6 Boardwalks / 1.8 Access for all / 2.1.1 Bridges: Design guidelines / Part C 1.0 Suppliers

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
—	●	+	+	+	+	<b>R/S/U</b>
Low + Medium ● High —	Good + Medium ● Poor —	Good + Medium ● Poor —	Low + Medium ● High —	Good + Medium ● Poor —	Good + Medium ● Poor —	Rural R Semi-rural S Urban U



## 2.2 STRUCTURES: WALLS

### 2.2.1 WALLS: DESIGN GUIDELINES

1 OF 2

The choice of walling materials today is vast and great care must be taken to ensure that the appearance of any new wall is in harmony with its setting - whether urban or rural.

An experienced professional needs to be consulted when designing walls.

CRITERIA to consider when selecting design and materials include:

**Function:**

divided into four basic groups:

**Physical/Visual Barriers:**

the precise function of a physical barrier must be established, is it to keep people and/or stock in or out?

A visual barrier is a large scale structure, and can be very obtrusive being over 1700mm.

**Space Definition:**

definition of space, marking of boundaries or the control of pedestrian/vehicle movements.

**Noise Barriers:**

screening of unpleasant effects of noise, usually passing traffic.

**Wind Breaks:**

in exposed areas walls can be used to create a sheltered environment.

Retaining Walls: See 2.3.1

**Permanence:**

Walls offer a permanent solution, but at a relatively high capital cost.

**Durability:**

Walls also offer varying durability against wear, vandalism and weathering. The required life of the enclosure must be established.

**Landscape Character:**

Look at the character of the surrounding landscape or townscape, the visual appearance of a new wall/s should be sympathetic to its surroundings.

**Local Techniques:**

Wherever possible investigate using these, generally they exploit readily available local materials and are often the most appropriate technique for the site. A hedge or fence may be more appropriate than a wall.

**Availability of Materials:**

Check local availability of materials, this frequently has an impact on time and cost.

**Local Site Conditions:**

Abnormal site conditions must be considered eg. in areas of extreme exposure or unstable soil conditions take special care when choosing form and materials, and obtain professional advice.

**Cost and Upkeep:**

Generally the more durable the material the higher the capital cost.

MATERIALS available include the following:

**Brick:**

The most commonly used material for walls. It is often assumed that any building brick will serve for a free-standing wall, however in this instance bricks are highly vulnerable to weathering being exposed on both sides. Bricks can be used in almost any locality - usually urban or semi-rural, provided the selected colour is appropriate to the area.

Brick manufacturers should be consulted on the technical aspects of the suitability of bricks.

**Natural Stone:**

Generally most appropriate in rural areas, where the local material and technique will provide the style of design. Only the local stone should be used and this is normally the cheapest.

**Concrete Blocks:**

A wide range of concrete blocks are available for free-standing situations, always check with manufacturer for suitability. Very strong and larger than bricks, concrete blocks are less expensive both in material and construction costs than bricks. Unless rendered or painted use best restricted to urban areas.

## 2.2 STRUCTURES: WALLS

### 2.2.1 WALLS: DESIGN GUIDELINES

2 OF 2

#### WALL CONSTRUCTION:

All walls should be referred to a structural engineer for checking, and stability calculations for such walls may be required by the district engineer or building inspector.

Planning approval is required from the local authority when the height of a wall exceeds 1m adjacent to a highway or 2m in other cases.

The following points summarise the elements of a brick wall, and are intended only as a guideline for briefing others:

#### Foundations:

depth and width depend on type of subsoil. A depth of 450-600mm is sufficient on average subsoils, but must be increased to 900mm or greater on shrinkable clays. A width of 525mm is normal for a 215mm wall, but site conditions should determine the final size.

#### Damp Proof Course:

unless frost-resistant bricks are used a damp-proof is essential 150mm from ground level to prevent saturation of the wall. Ideally two courses of engineering brick or two courses of 5mm slates should be used. Bituminous damp proof courses should be avoided as they undermine the stability of a wall.

#### Copings:

prevent water penetrating the top of a wall, and may also throw water clear of the wall face. For brick walls three basic types are used:

- **brick an edge**, not all bricks are suitable for copings and those which are porous will require a damp-proof course below the coping. Check with brick manufacturer for suitability.
- **brick specials**, such as half round copings and saddle back copings visually add enormously to the appearance of a wall but are relatively expensive.
- **pre-cast concrete coping units** are only really relevant in urban areas and visually best avoided.

#### Brick Bonds:

have a subtle but very important visual impact and local existing examples of walls should set the precedent. Traditional bonds for 215mm thick free-standing walls are shown.

#### Jointing and Mortars:

the mortar creates the permanent bond between the bricks to resist lateral pressure. Type of mortar must be related to type of brick and whether the brickwork is above/below ground.

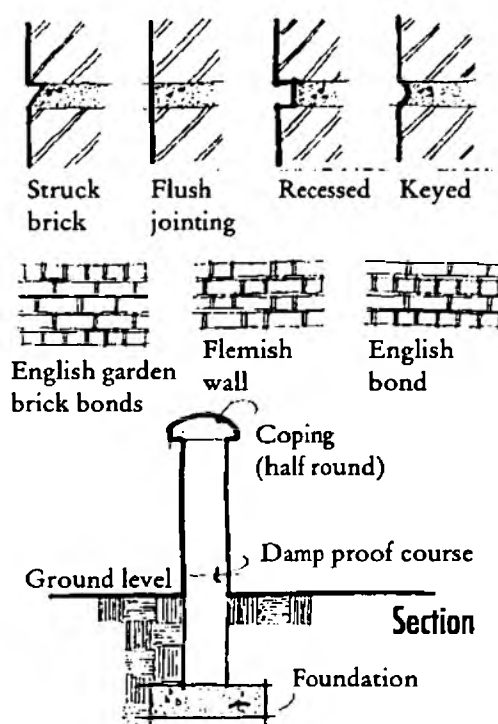
Colour of mortar is also an important consideration as is the way in which the brick joints are finished, four traditional jointing methods are shown.

#### Wall Thickness:

unless the site is particularly exposed a wall 215mm thick without piers should be adequate for height up to 2m. Walls on exposed sites or walls of considerable length or height over 1.8m should be structurally designed.

#### Expansion Joints:

necessary to accommodate thermal expansion. A 10mm joint should be provided every 12m for brick/concrete block walls. Expansion joints may be left open or filled with proprietary board and jointing mastic.

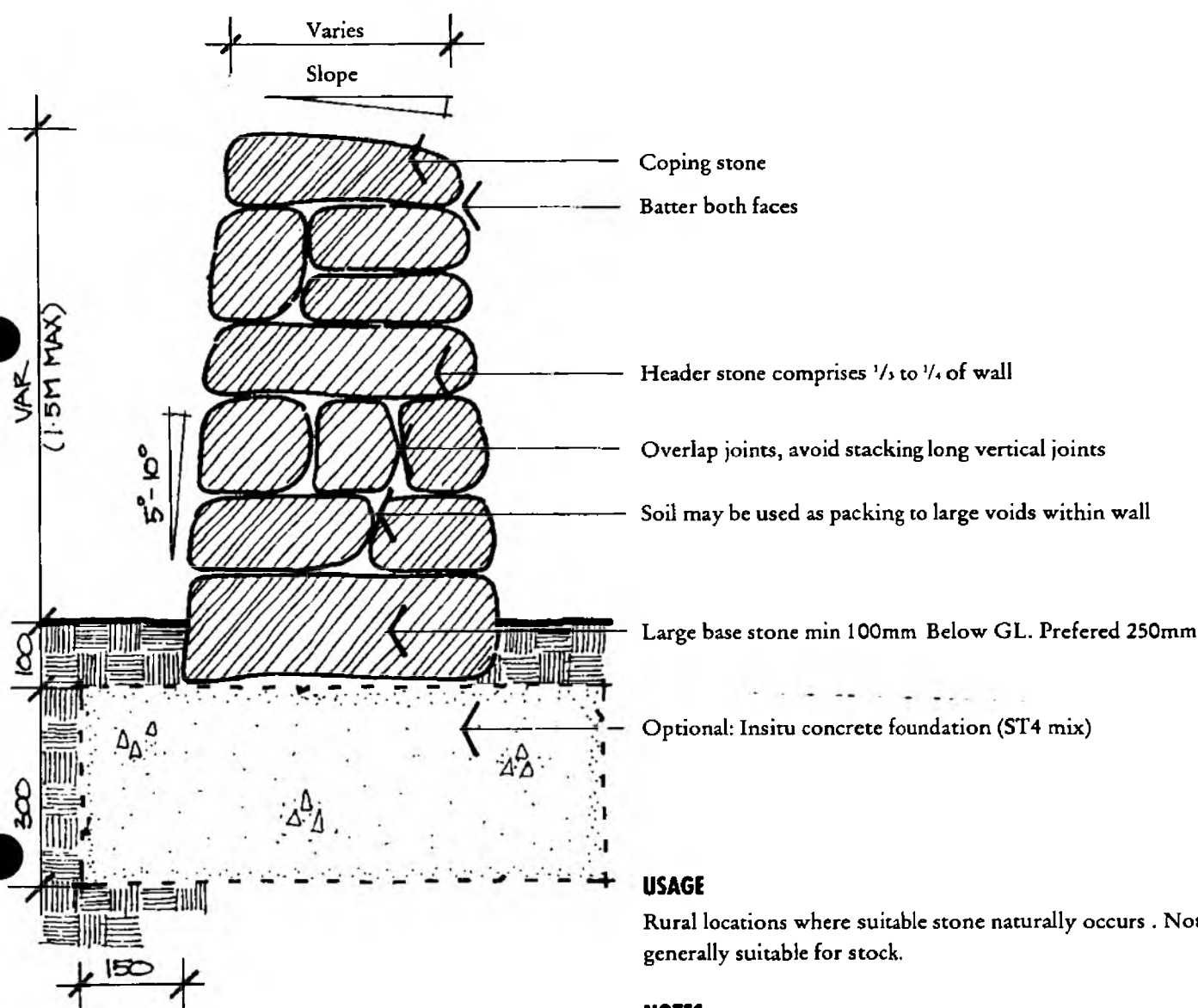


Source: LUC

## 2.2 STRUCTURES: WALLS

### 2.2.2 DRYSTONE WALL: SINGLE TIER

SCALE 1:10      1 OF 1



## Section

Source: LUC, Adapted from Littlewood, M, (1993)

## USAGE

Rural locations where suitable stone naturally occurs . Not generally suitable for stock.

## NOTES

Any easily/cheaply obtainable stone provided that naturally occurring pieces are of sufficient size, are of local provenance, and are not prone to excessive weathering

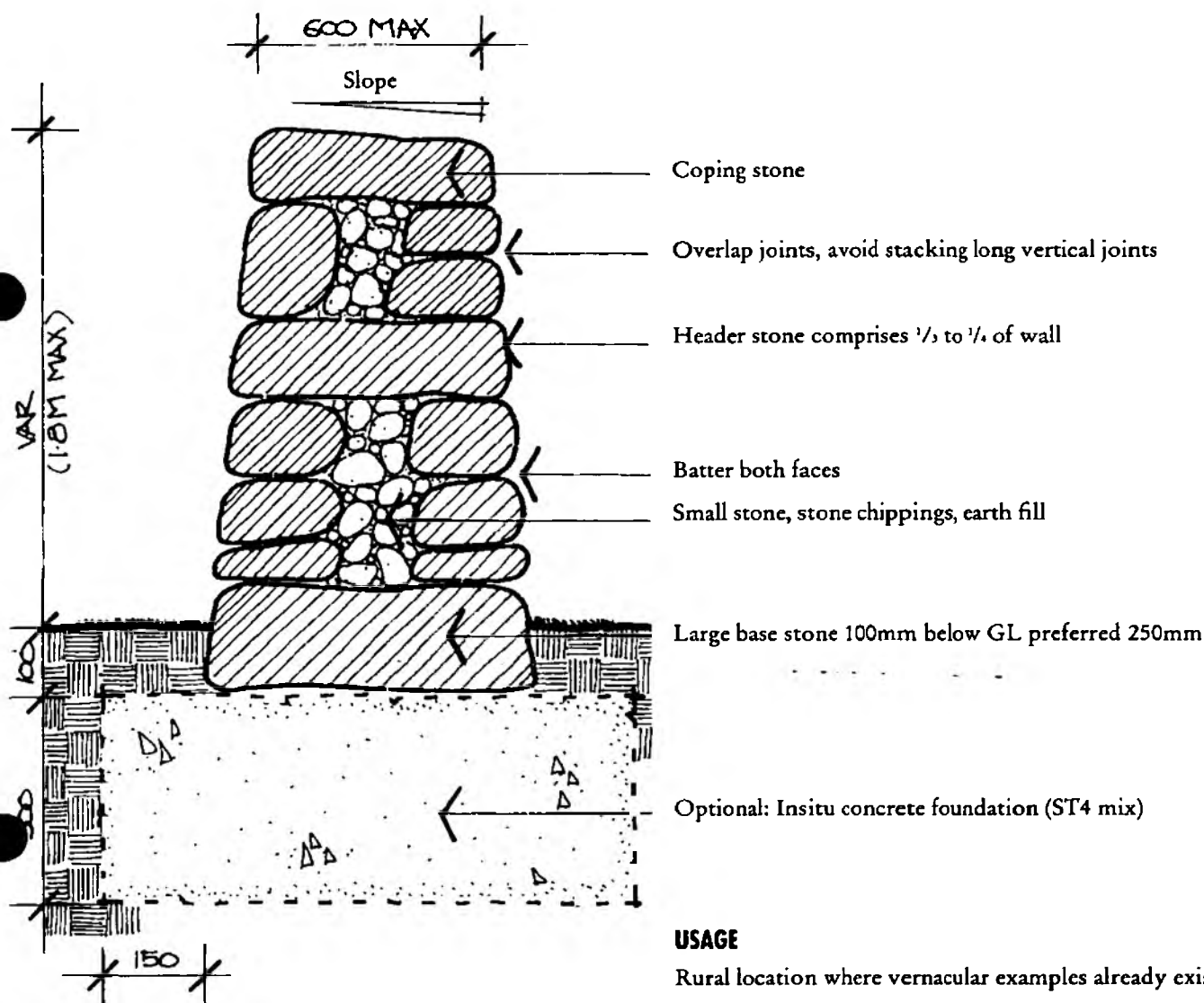
Refer to: **2.2.1 Walls: Design guidelines / 2.5 Gates and stiles**

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
—	●	+	+	+		<b>R</b>
Low +	Good +	Good +	Low +	Good +	Good +	Rural R
Medium ●	Medium ●	Medium ●	Medium ●	Medium ●	Medium ●	Semi-rural S
High —	Poor —	Poor —	High —	Poor —	Poor —	Urban U

## 2.2 STRUCTURES: WALLS

### 2.2.3 DRYSTONE WALLS: DOUBLE TIER

SCALE 1:10 1 OF 1



#### USAGE

Rural location where vernacular examples already exist

#### NOTES

Any easily/cheaply obtainable stone provided that naturally occurring pieces are of sufficient size, are of local provenance, and are not prone to excessive weathering.

Source: LUC, Adapted from  
Littlewood, M, (1993)

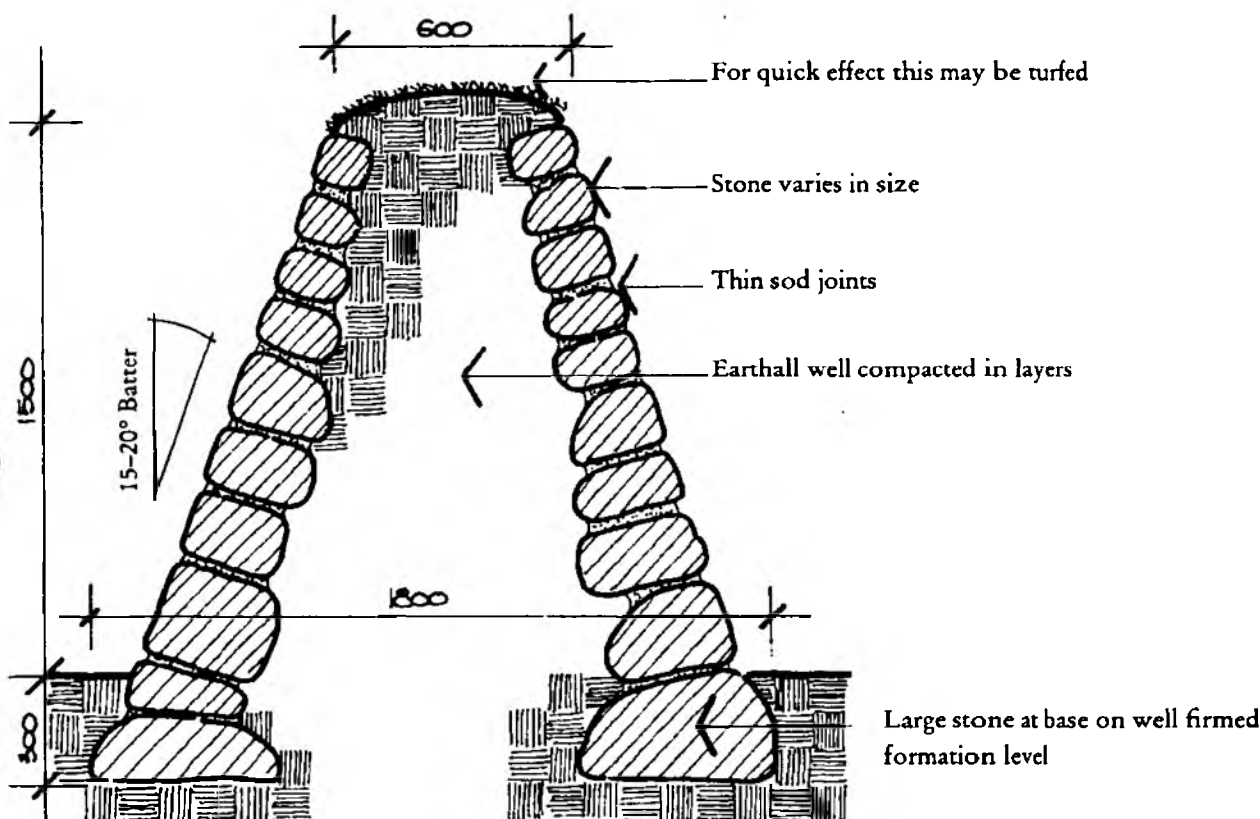
Refer to: 2.2.1 Walls: Design guidelines / 2.5 Gates and stiles

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
-	•	+	+	+		<b>R</b>
Low +	Good +	Good +	Low +	Good +	Good +	Rural R
Medium •	Medium •	Medium •	Medium •	Medium •	Medium •	Semi-rural S
High -	Poor -	Poor -	High -	Poor -	Poor -	Urban U

## 2.2 STRUCTURES: WALLS

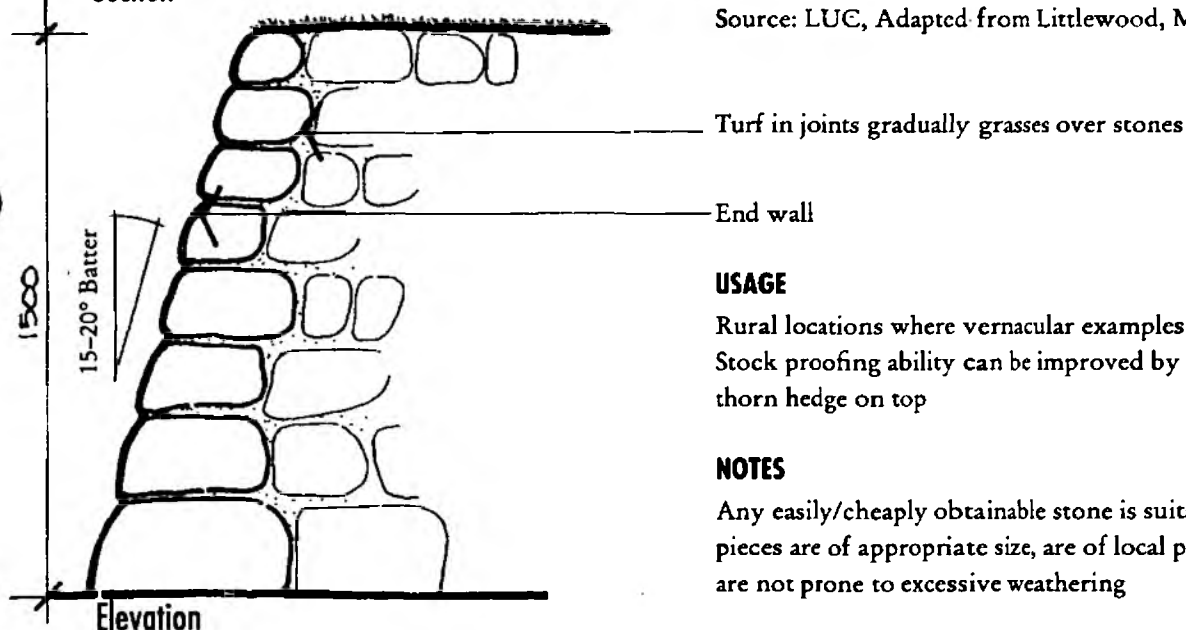
### 2.2.4 DRYSTONE WALL AND FENCE/HEDGE

SCALE 1:20 1 OF 1



Section

Source: LUC, Adapted from Littlewood, M, (1993)



Elevation

#### USAGE

Rural locations where vernacular examples already exist. Stock proofing ability can be improved by planting quick thorn hedge on top

#### NOTES

Any easily/cheaply obtainable stone is suitable provided pieces are of appropriate size, are of local provenance and are not prone to excessive weathering

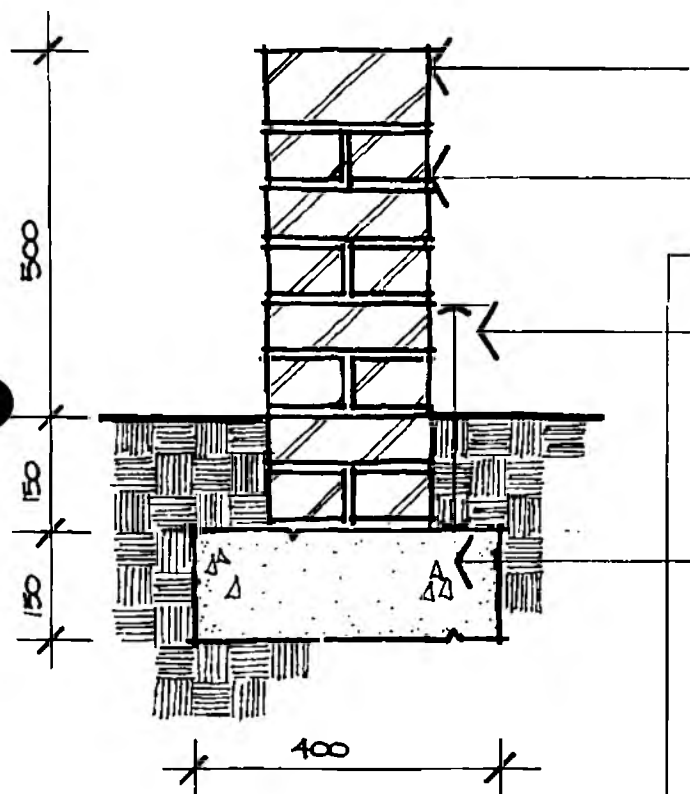
Refer to: 2.2.1 Walls: Design guidelines / 2.5 Gates and stiles

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
-	•	+	+	+		<b>R</b>
Low + Medium • High -	Good + Medium • Poor -	Good + Medium • Poor -	Low + Medium • High -	Good + Medium • Poor -	Good + Medium • Poor -	Rural R Semi-rural S Urban U

## 2.2 STRUCTURES: WALLS

### 2.2.5 BRICK WALL

SCALE 1:10 1 OF 1



Brick on edge coping

Brick wall

Use 2 No. galv. steel cramps once bent and ragged to stop ends

Class A or B Engineering Brick

Concrete foundation

Section

#### USAGE

Primarily for an urban location where brick is already part of the local vernacular

#### NOTES

The type of brick used should take into account brick type within the vicinity to ensure continuity

When choosing a brick type consult the manufacturer to ensure that the brick type is suitable for the degree of exposure intended

The standard brick format is 215 x 112.5 x 75mm

Planning approval is required from the Local Authority when the height of a wall exceeds 1m adjacent to a highway or 2m in other cases

Source: LUC, Adapted from Littlewood, M, (1993)

Elevation

Refer to: 2.2.1 Walls: Design guidelines / 2.3.5 Retaining walls: Brick / 2.5 Gates and stiles

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
—	—	+	+	•		<b>S/U</b>
Low + Medium • High —	Good + Medium • Poor —	Good + Medium • Poor —	Low + Medium • High —	Good + Medium • Poor —	Good + Medium • Poor —	Rural R Semi-rural S Urban U

## 2.3 STRUCTURES: RETAINING WALLS

### 2.3.1 RETAINING WALLS: DESIGN GUIDELINES

1 OF 1

#### FUNCTION:

All soils have an angle of repose, and when this is exceeded it will be necessary to build a retaining structure.

For simple low walls and retaining structures it is essential to seek professional advice from a consulting engineer, experienced professional or contractor.

The following notes and subsequent details are only intended as a guide to possible options.

**MATERIALS** available include the following:

#### Brick:

is the traditional material for retaining walls in landscape work and although expensive is still appropriate in the urban and semi-rural setting (see 2.3.5).

#### Timber:

offers one of the technologically simplest ways of constructing a retaining wall and is sympathetic to semi-rural and rural locations. Individual timbers are placed vertically shoulder to shoulder, and a horizontal waling increases the stability of the individual members (see 2.3.4).

#### Crib-walling:

consists of a three-dimensional lattice of precast concrete or timber, with the interstices being filled with selected as-dug material. Commercially available precast concrete and timber systems are available, but the former are best avoided even in urban settings for aesthetic reasons. Manufacturers' instructions should always be followed. 2.3.3 offers a variant using hard or softwood logs.

#### Natural Stone:

as with free-standing walls traditional details utilising local natural stones have been developed and tested over centuries. Local observation is vital here, and obviously use of local stone is most relevant in rural localities.

#### In situ Concrete and Concrete Blocks:

are extensively used in retaining walls especially where reinforcement is necessary. Most appropriate in urban setting.

#### Erosion Control Matting:

the simplest, cheapest and visually least obvious way to protect a bank which might otherwise erode is to establish vegetation on it. Pre-seeded biodegradable matting allows vegetation to establish before erosion becomes a problem, and is most relevant in rural and semi-rural locations.

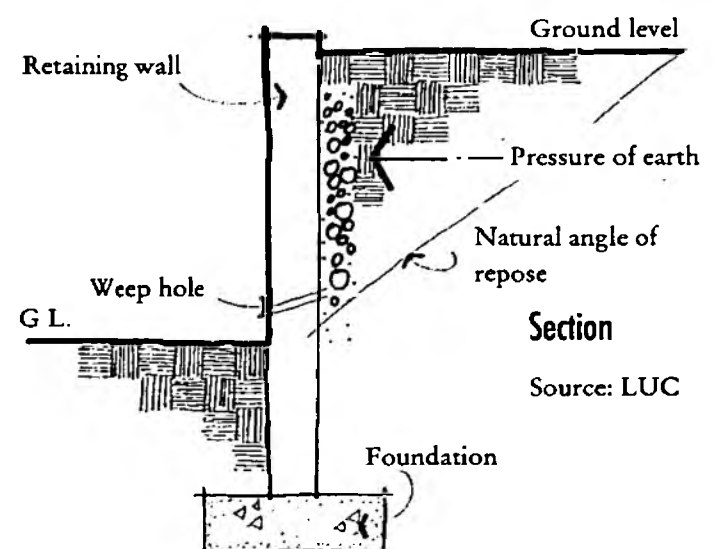
#### DESIGN:

retaining walls set the following problems:

- the construction of the wall itself to withstand the earth pressure behind;
- the expansion of the wall along its length. Walls of any length will require expansion joints;
- the drainage of water from the retained earth, this is normally achieved by backfilling with granular material and providing weep-holes through the wall.

Seek professional advice if unstable soil conditions are present.

**Note:** Pipes and holes can be provided in retaining wall to provide nesting places for birds and habitats for other animals.

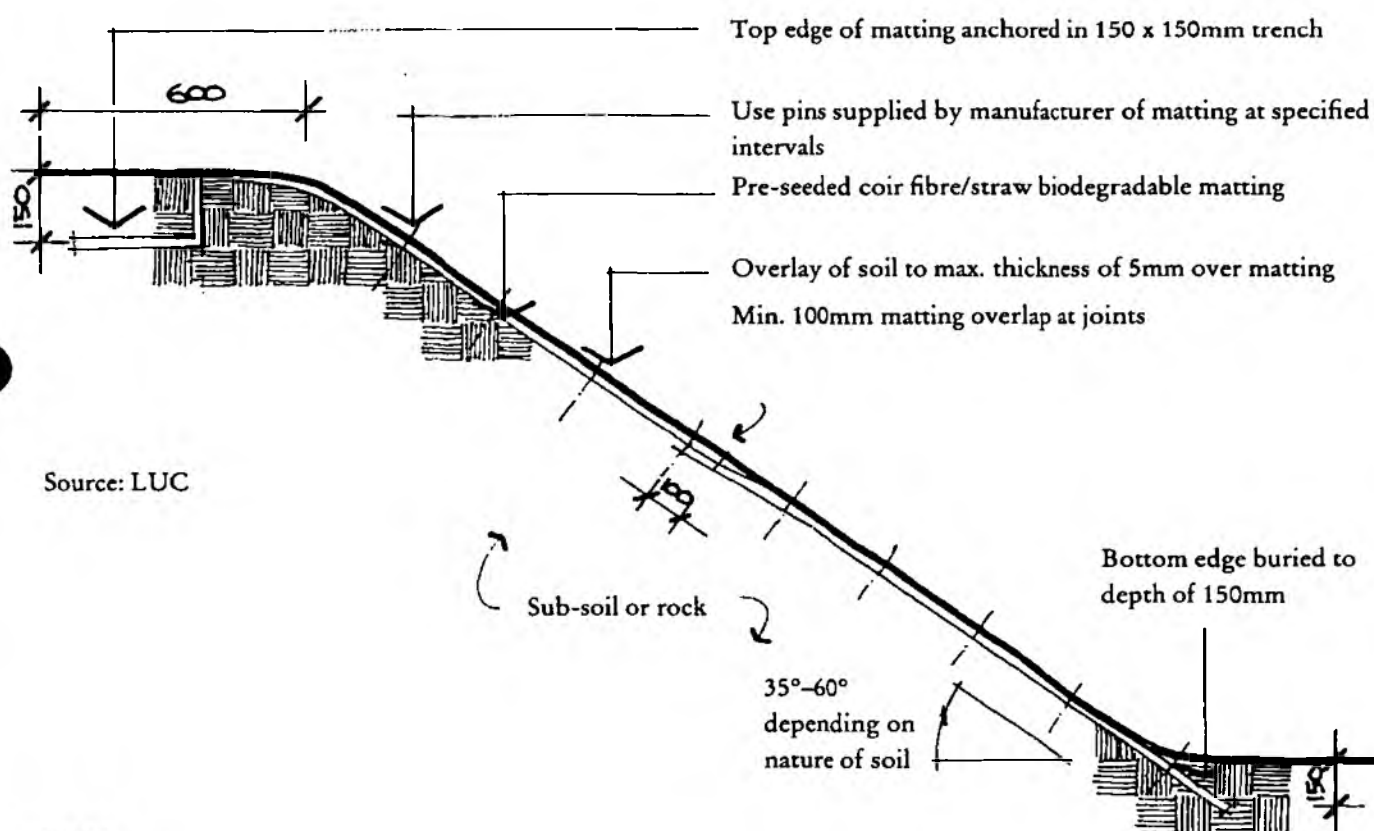


## 2.3 STRUCTURES: RETAINING WALLS

### 2.3.2 REINFORCED GRASS

SCALE 1:20

1 OF 1



Source: LUC

#### USAGE

Moderately priced method of soil stabilisation and erosion control for use in rural and semi-rural locations.

Pre-seeded mats are available using a selection of seed types and allow rapid vegetation establishment.

#### NOTES

Several proprietary brands of matting are available (see Part C) and manufacturer's instructions must be carefully followed.

In area of unstable soil conditions obtain advice of a civil engineer.

Refer to: **Part C 1.0 Suppliers**

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
•	+	+	+	+		<b>R/S</b>
Low + Medium • High -	Good + Medium • Poor -	Good + Medium • Poor -	Low + Medium • High -	Good + Medium • Poor -	Good + Medium • Poor -	Rural R Semi-rural S Urban U



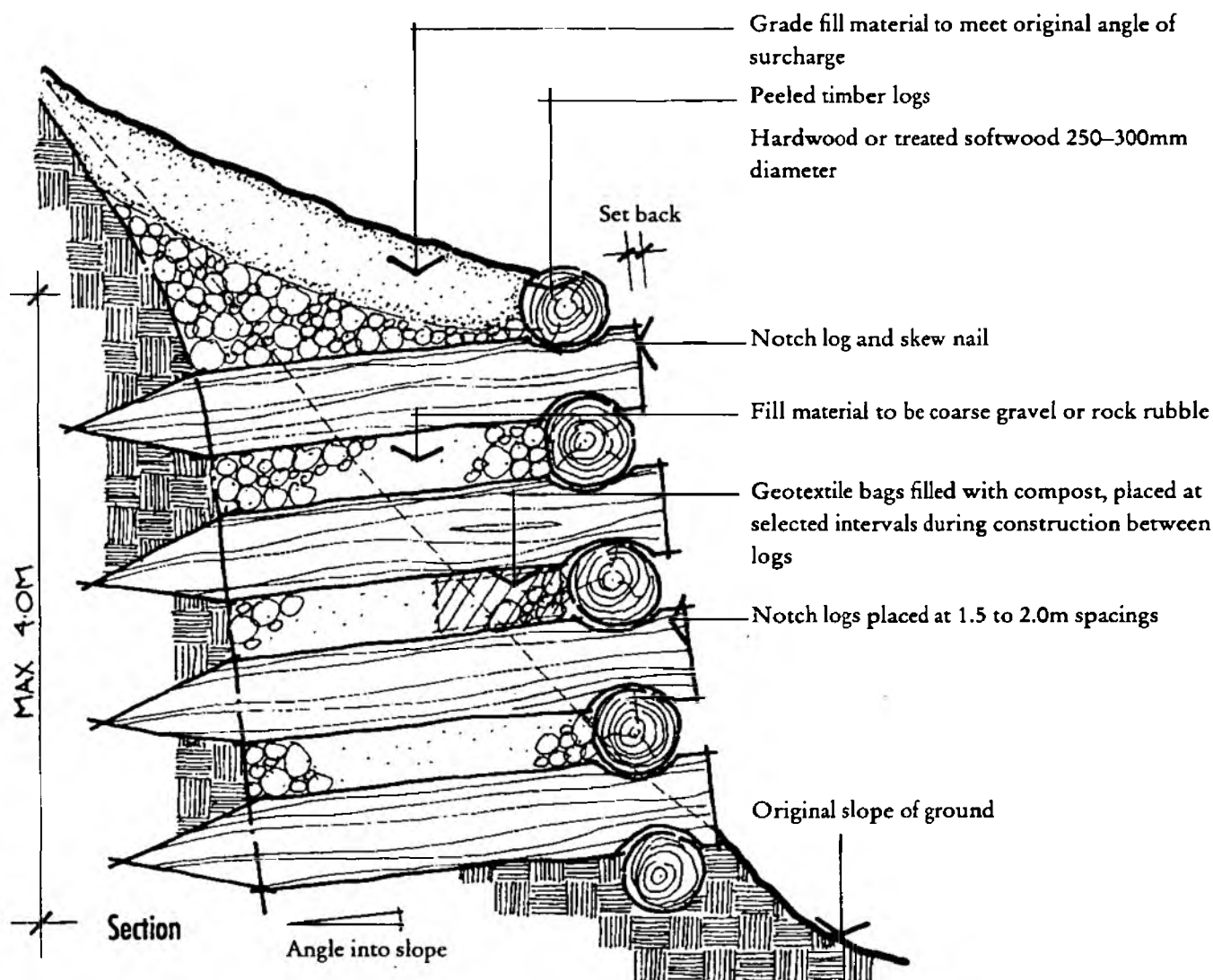
## 2.3 STRUCTURES: RETAINING WALLS

### 2.3.3 TIMBER CRIB-LOCK

SCALE 1:20

1 OF 1

Source: LUC, Adapted from Littlewood, M, (1993)



#### USAGE

A low-tech method of bank stabilisation/retaining wall for rural sites. Potentially on-site materials could be used

#### NOTES

All timber should be either farmed hardwood or pressure impregnated softwood to BS 1282 (1975)

Compost filled Geotextile bags allow planting of climbers such as ivy which will soften the visual impact of the wall

For all Timber crib-lock walls a structural engineer should be consulted

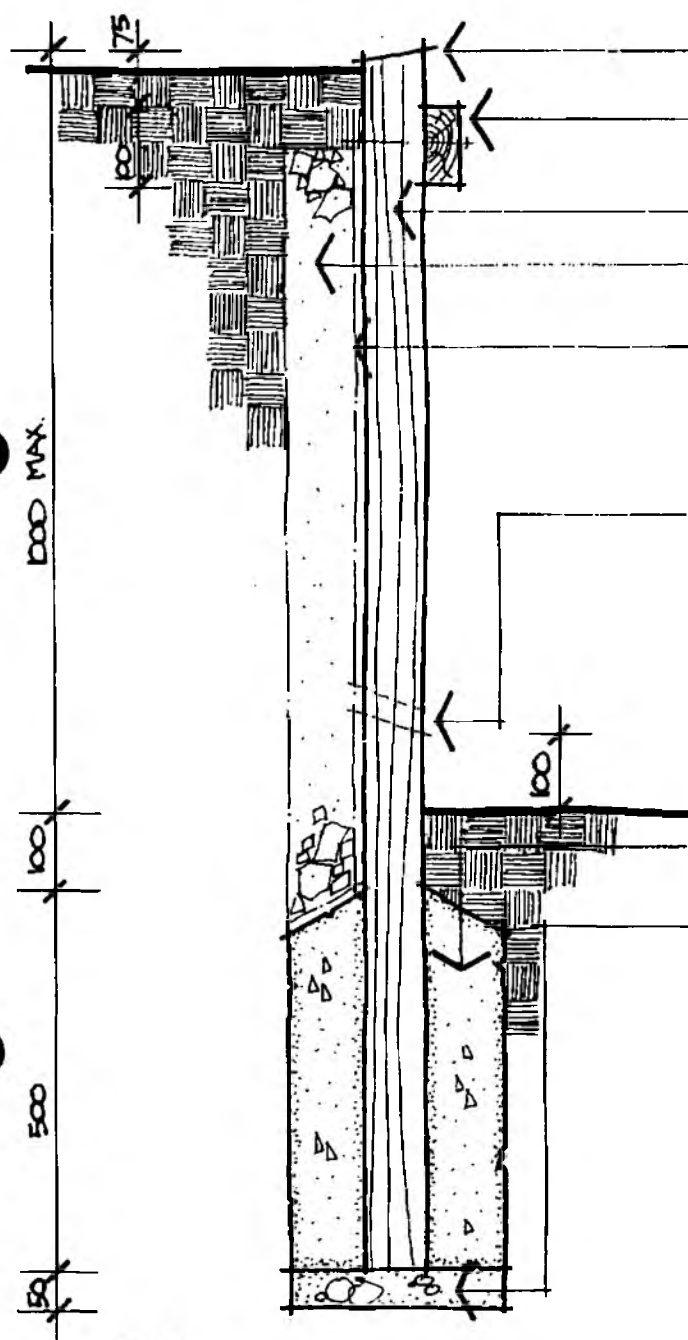
Refer to: 2.3.1 Retaining walls: Design guidelines / 2.3.6 Proprietary crib-lock walls

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
—	—	+	•	+		<b>R/S</b>
Low + Medium • High —	Good + Medium • Poor —	Good + Medium • Poor —	Low + Medium • High —	Good + Medium • Poor —	Good + Medium • Poor —	Rural R Semi-rural S Urban U

## 2.3 STRUCTURES: RETAINING WALLS

### 2.3.4 VERTICAL TIMBER PILING

SCALE 1:10 1 OF 1



Section

Weathered top

Softwood waling 50 x 100mm fixed with coachbolts to uprights

Softwood uprights 75 x 150 x 1600mm

100mm width compacted granular fill

Geotextile membrane laid against rear side of uprights; joints lapped to min 200mm, and punctured to accommodate weep-pipe.

Black P.V.C. weep-pipe 37mm dia. at 3000mm centres

Concrete ST4 mix foundation and haunching 275 x 275 x 450mm

50mm compacted fill

#### USAGE

A simple wooden retaining structure for rural and semi-rural locations

#### NOTES

All softwood to be pressure impregnated to BS 1282 (1975)

For retaining wall consult a civil engineer for advice

Source: LUC

Refer to: 2.3.1 Retaining walls: Design guidelines

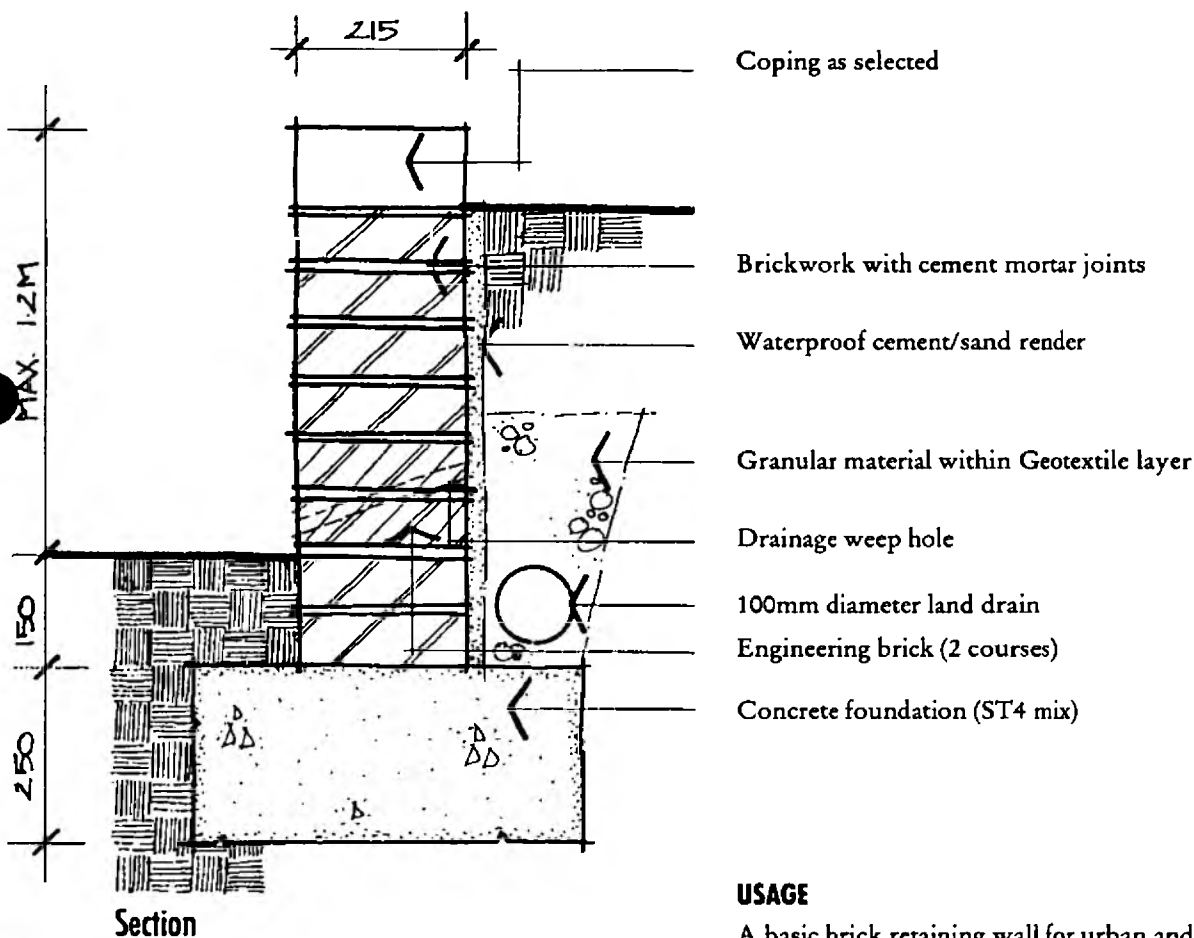
Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
●	●	+	+	+		<b>R/S</b>
Low + Medium ● High -	Good + Medium ● Poor -	Good + Medium ● Poor -	Low + Medium ● High -	Good + Medium ● Poor -	Good + Medium ● Poor -	Rural R Semi-rural S Urban U

## 2.3 STRUCTURES: RETAINING WALLS

### 2.3.5 BRICK

SCALE 1:10

1 OF 1



Source: LUC, Adapted from Littlewood, M, (1993)

#### USAGE

A basic brick retaining wall for urban and semi-rural situations where brick is part of the local vernacular. Brick type should be carefully selected to coordinate with local examples.

#### NOTES

For retaining wall consult a civil engineer for advice

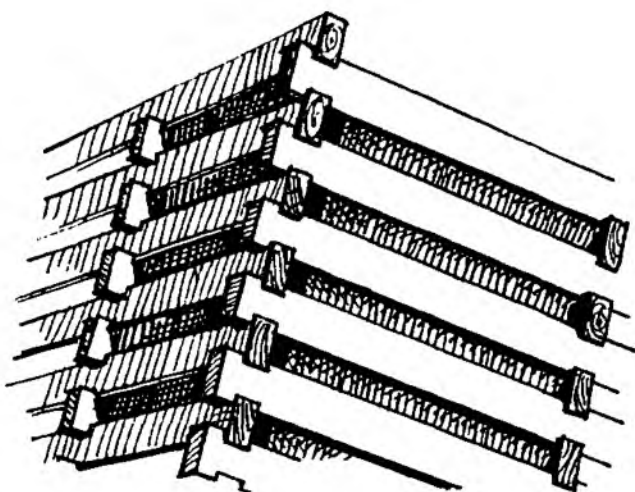
Refer to: 1.7.4 Brick steps / 2.2.5 Brick wall / 2.3.1 Retaining walls: Design guidelines

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
—	—	+	+	●		<b>U</b>
Low + Medium ● High —	Good + Medium ● Poor —	Good + Medium ● Poor —	Low + Medium ● High —	Good + Medium ● Poor —	Good + Medium ● Poor —	Rural R Semi-rural S Urban U

## 2.3 STRUCTURES: RETAINING WALLS

### 2.3.6 PROPRIETARY TIMBER CRIB-LOCK WALLS

1 OF 1



#### SPECIFICATIONS

Varying widths and maximum retaining heights

#### MATERIALS

Generally pressure impregnated softwood. Check that source complies with NRA Environmental Policy

#### FINISH

Natural timber finish

#### FIXING

Installed strictly to manufacturer's instruction and backfill with crushed rock/gravel, maximum size 100mm

Seek professional engineering advice

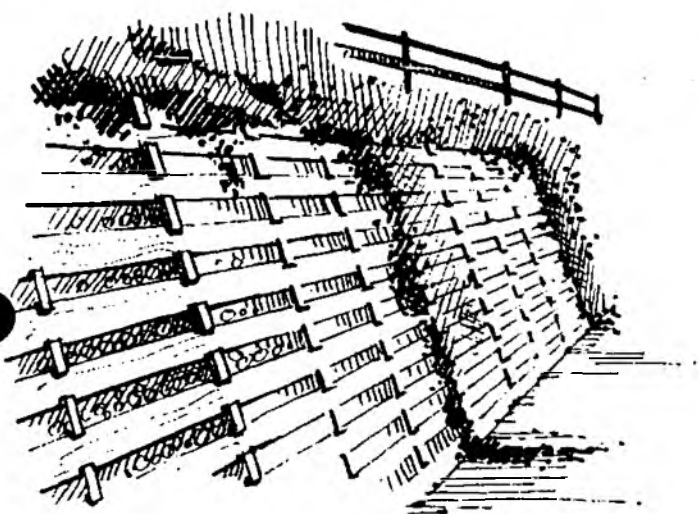
#### USAGE

Visually a relatively acceptable method of soil retention, allowing a max. retained height of 10m

For use in urban, semi-rural and rural locations

#### NOTES

If topsoil pockets are incorporated into the backfill dense vegetation can quickly be established



Refer to: 2.3.1 Retaining walls: Design guidelines / 2.3.3 Timber crib-lock

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
—	—	+	+	+		<b>R/S/U</b>
Low + Medium • High —	Good + Medium • Poor —	Good + Medium • Poor —	Low + Medium • High —	Good + Medium • Poor —	Good + Medium • Poor —	Rural R Semi-rural S Urban U

## 2.4 STRUCTURES: FENCING

### 2.4.1 FENCING: DESIGN GUIDELINES

1 OF 1

**CRITERIA** to consider when selecting design and materials include:

**Function:**

divided into four basic groups:

**Physical/Visual Barriers:**

the precise function of a physical barrier must be established, is it to keep people and/or stock in or out?

A visual barrier is a large scale structure, and can be very obtrusive being over 1700mm.

**Space Definition:**

definition of space, marking of boundaries or the control of pedestrian/vehicle movements.

**Noise Barriers:**

screening of unpleasant effects of noise, usually passing traffic.

**Wind Breaks:**

in exposed areas fences can be used to create a sheltered environment.

**Permanence:**

There may be design reasons for using a cheaper and less permanent material (post and wire fence).

**Durability:**

Fences also offer varying durability against wear, vandalism and weathering. The required life of the enclosure must be established.

**Landscape Character:**

Look at the character of the surrounding landscape, whether urban or rural, or townscape, the visual appearance of a new fence should be sympathetic to its surroundings.

**Local Techniques:**

Wherever possible investigate using these, generally they exploit readily available local materials and are often the most appropriate technique for the site. A hedge or wall may be more appropriate than a fence.

**Availability of Materials:**

Check local availability of materials, this frequently has an impact on time and cost.

**Local Site Conditions:**

Abnormal site conditions must be considered eg. in areas of extreme exposure or unstable soil conditions take special care when choosing form and materials, and obtain professional advice.

**Cost and Upkeep:**

Generally the more durable the material the higher the capital cost.

**Legislation:**

Planning approval is required from the local authority when the height of a fence exceeds 1m adjacent to a highway or 2m in other cases.

**MATERIALS** available include the following:

**Timber:**

has the advantage of versatility, robustness, durability and straightforward maintenance as a fencing material. Repairs are simple and require readily available materials.

All softwood must be pressure impregnated by a vacuum process to BS 1282 (1975).

**Metal:**

is primarily a fencing material for use in urban settings, reflecting the popularity of wrought iron fences in the 19th century. In the rural setting it has most potential where a physically strong barrier is needed, but one which gives little visual obstruction. Steel parkland fencing (see 2.4.3) displays this, its clarity of line and lightness allowing open views.

**Precast Concrete:**

fences have a heavy and cumbersome appearance and are best avoided even in urban situations.

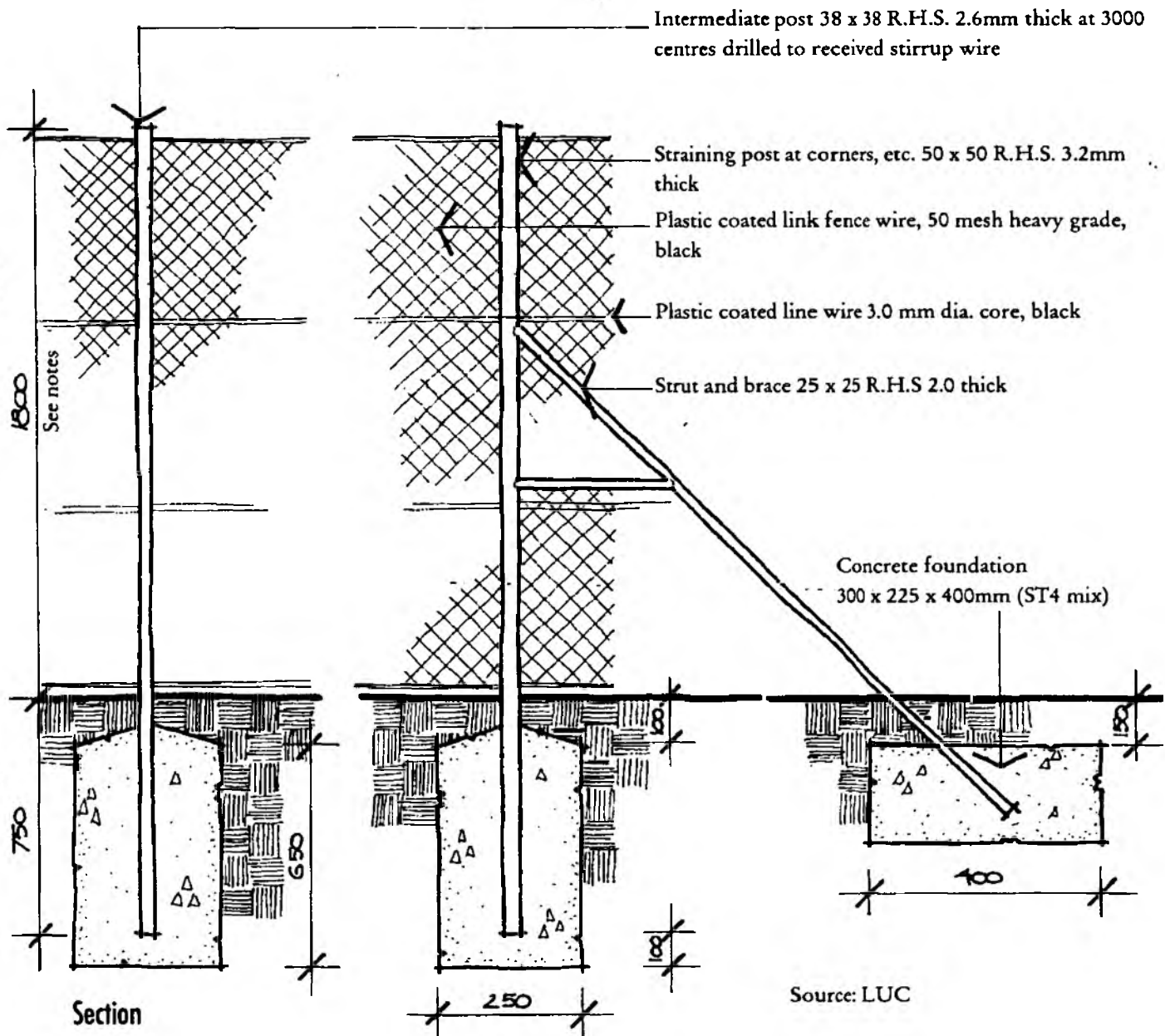
**DESIGN:**

Straightforward detailing and sound construction will always give a fence which looks well. The type and height of fence must be determined by its function and location. Local observation is vital here, for traditional details have been developed and tested over centuries and set a precedent which should be followed in rural and semi-rural locations.

## 2.4 STRUCTURES: FENCING

### 2.4.2 CHAIN LINK FENCE

SCALE 1:20 1 OF 2



Refer to: 2.4.1 Fencing: Design guidelines / 2.5 Gates and stiles

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
●	●	+	+	●		<b>R/S/U</b>
Low + Medium ● High -	Good + Medium ● Poor -	Good + Medium ● Poor -	Low + Medium ● High -	Good + Medium ● Poor -	Good + Medium ● Poor -	Rural R Semi-rural S Urban U

## 2.4 STRUCTURES: FENCING

### 2.4.2 CHAIN LINK FENCE

SCALE 1:20

2 OF 2

#### USAGE

Low cost medium security fencing for semi-rural and rural context provided it is well screened by vegetation

#### NOTES

1. All fencing refer to BS 1722 Part 2 (1989)
2. All steel hot dipped galv. to BS 729 (1986)
3. All steel paint finish. 1 coat acid etch primer, 2 coats external gloss black or left unpainted
4. Use straining posts at all gateways, change of slope or direction and corners may be needed for extensive runs
5. Fence also available at 0.9m, 1.2m, 1.5m and 2.4m standard heights with line wire at max. 600m spacing
6. Chain link fence wire to be attached to all line wires at 500mm intervals

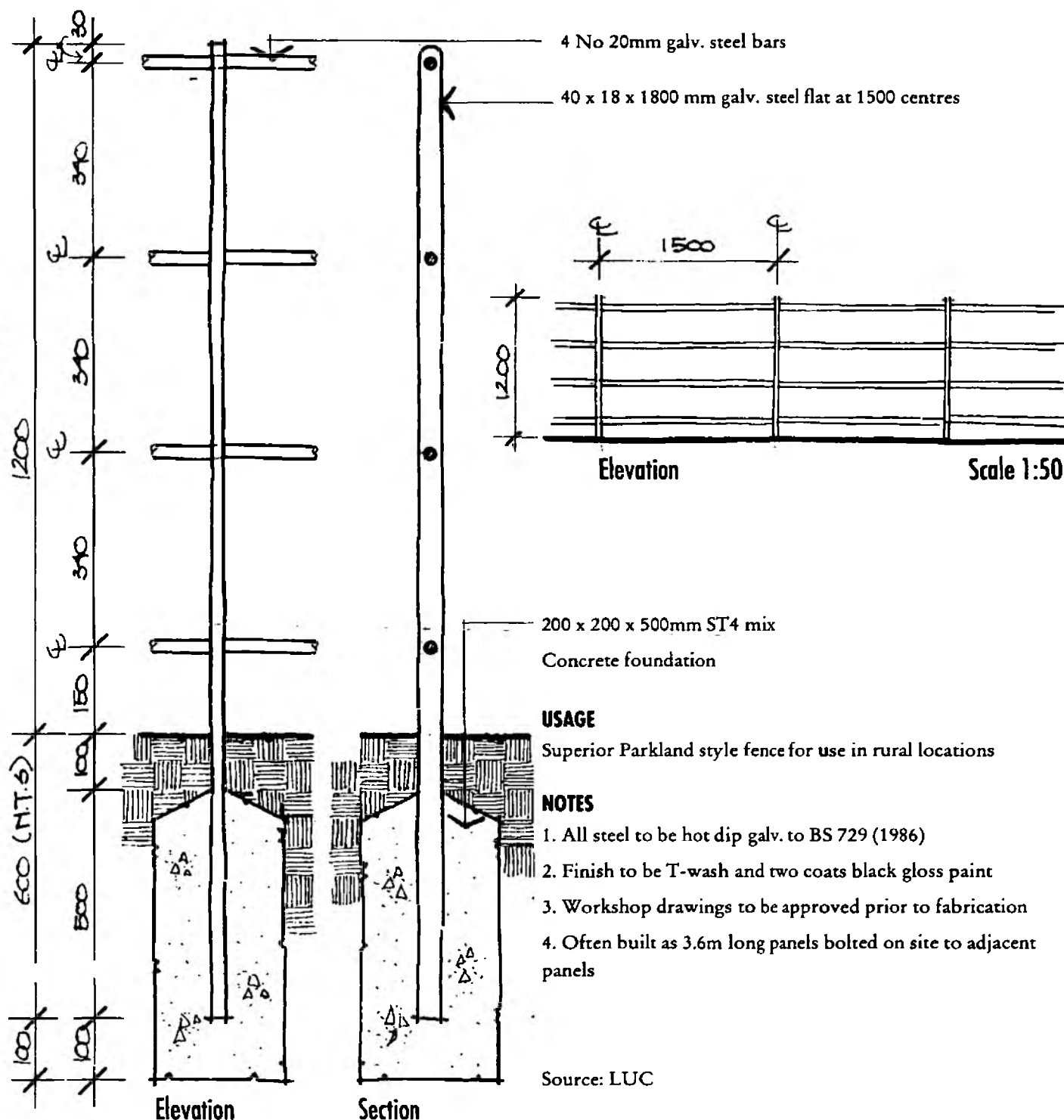
Refer to: 2.4.1 Fencing: Design guidelines / 2.5 Gates and stiles

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
●	●	+	+	●		<b>R/S/U</b>
Low + Medium ● High —	Good + Medium ● Poor —	Good + Medium ● Poor —	Low + Medium ● High —	Good + Medium ● Poor —	Good + Medium ● Poor —	Rural R Semirural S Urban U

## 2.4 STRUCTURES: FENCING

### 2.4.3 STEEL PARKLAND FENCE

SCALE 1:10 1 OF 1



Refer to: 2.4.1 Fencing: Design guidelines / 2.5.4 Steel gate

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
•	•	+	+	•		<b>R/S</b>
Low + Medium • High -	Good + Medium • Poor -	Good + Medium • Poor -	Low + Medium • High -	Good + Medium • Poor -	Good + Medium • Poor -	Rural R Semi-rural S Urban U

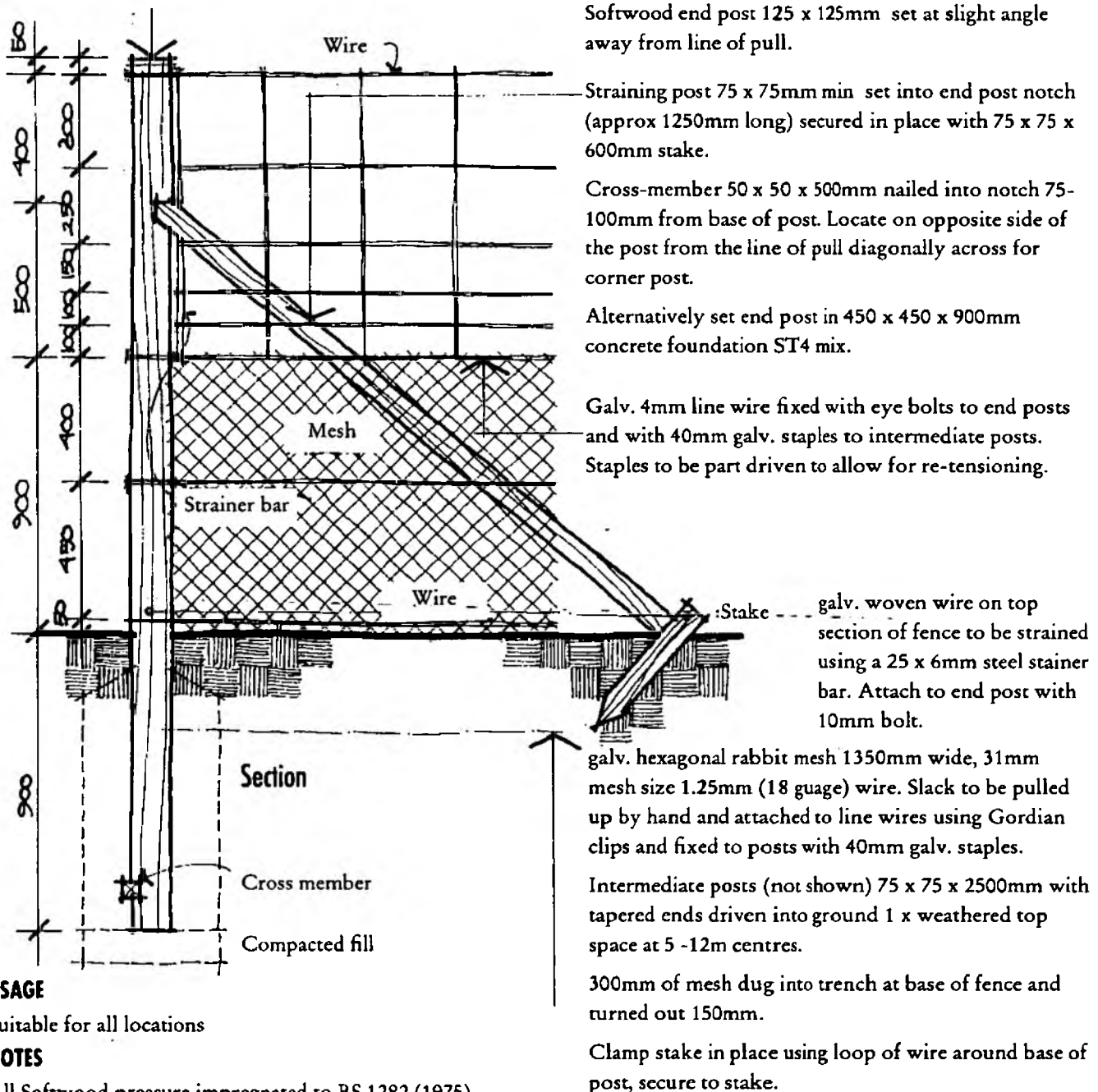


## 2.4 STRUCTURES: FENCING

### 2.4.4 DEER FENCE

SCALE 1:20 1 OF 2

Source: LUC



#### USAGE

Suitable for all locations

#### NOTES

All Softwood pressure impregnated to BS 1282 (1975)

All fixings and fixtures galv. steel to BS 729 (1986)

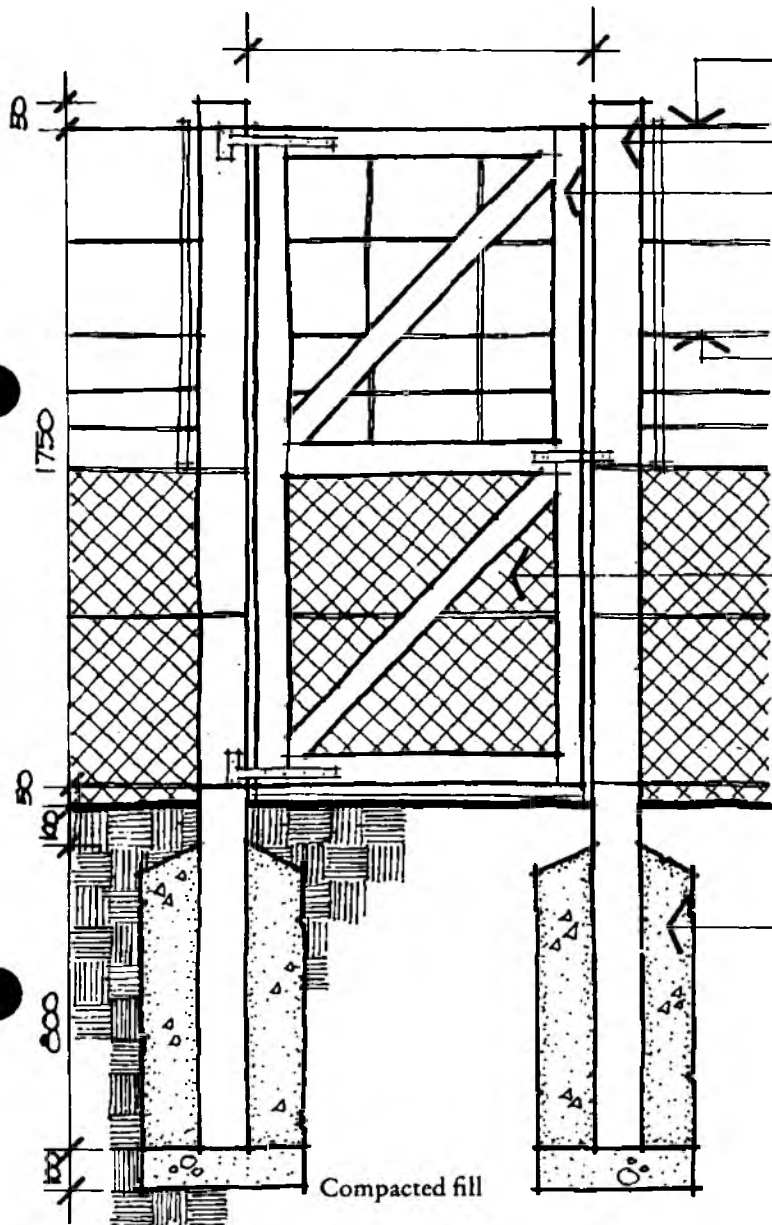
Refer to: **2.4.1 Fencing: Design guidelines / 2.5 Gates and stiles**

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
•	•	+	+	+	-	R
Low +	Good +	Good +	Low +	Good +	Good +	Rural R
Medium •	Medium •	Medium •	Medium •	Medium •	Medium •	Semi-rural S
High -	Poor -	Poor -	High -	Poor -	Poor -	Urban U

## 2.4 STRUCTURES: FENCING

### 2.4.4 DEER FENCE

SCALE 1:20 2 OF 2



Section

Source: LUC

Deer fence

Softwood end post 125 x 125 mm

Softwood frame and brace 75 x 50mm. All joints to be morticed and tenoned. Brace same alignment as gate members

Galv. 4mm line wire fixed with eye bolts to posts. Galv. woven wire on top section of fence to be strained using a 25 x 6mm steel straining bar. Attach to end post with 10mm bolt

Galv. hexagonal rabbit mesh fixed to frame with 40mm galv. staples

Hinge 1 pair 300 light reversible with galv. finish 35mm screw fixing

Latch heavy duty Suffolk, galv. barrel bolt to take padlock

450 x 450mm concrete ST4 mix foundation

#### USAGE

Suitable for all locations

#### NOTES

All Softwood pressure impregnated to BS 1282 (1975)

All fixings and fixtures galv. steel to BS 729 (1986)

Fix flexible rubber strip or similar to underside of gate to prevent rabbits burrowing

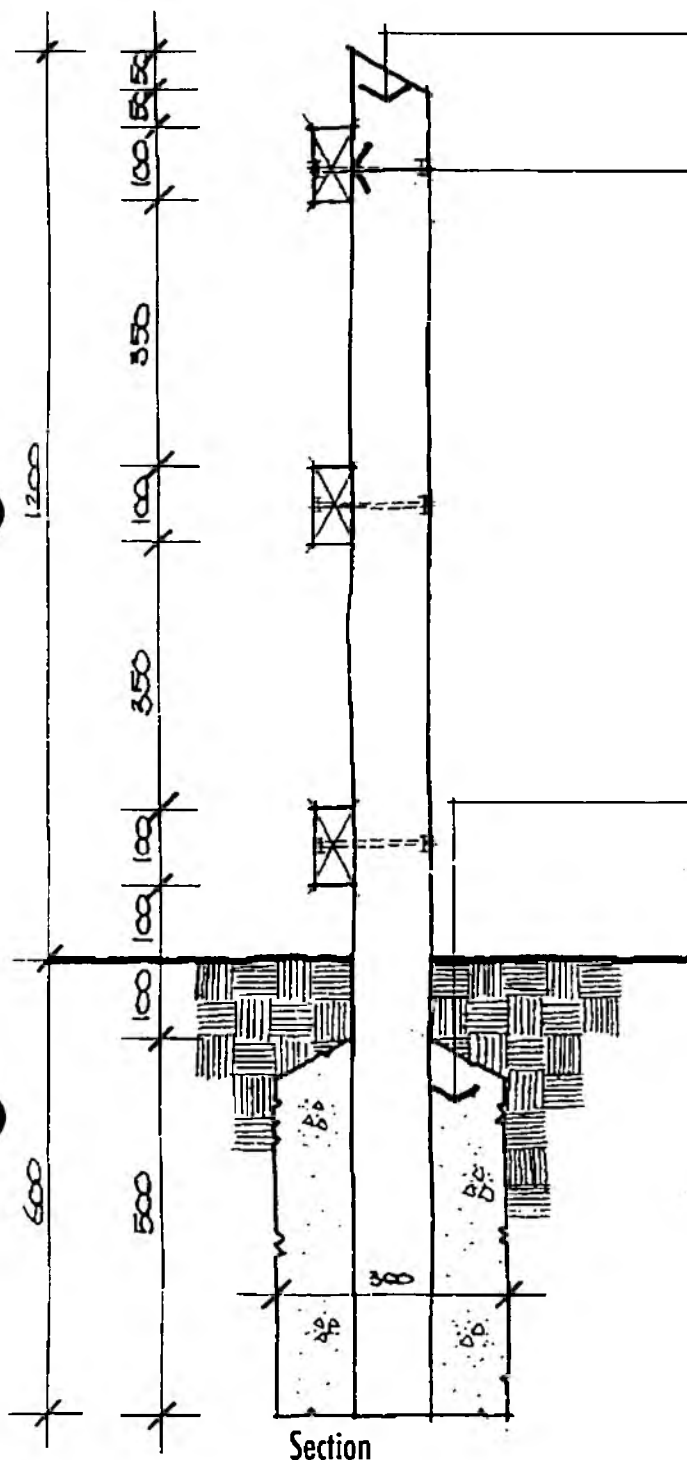
Refer to: 2.4.1 Fencing: Design guidelines / 2.5 Gates and stiles

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
•	•	+	+	+	-	<b>R</b>
Low + Medium • High -	Good + Medium • Poor -	Good + Medium • Poor -	Low + Medium • High -	Good + Medium • Poor -	Good + Medium • Poor -	Rural R Semi-rural S Urban U

## 2.4 STRUCTURES: FENCING

### 2.4.5 TIMBER POST AND RAIL

SCALE 1:10 1 OF 2



Softwood post 100 x 100 x 1800mm at 1800mm centres.  
Angle top as indicated

Softwood rail 100 x 50 x 5600mm; joints to be staggered  
(see sheet 2); fix with 2 No. coach bolts and washers to  
posts; nuts to be countersunk to rear of posts.

300 x 300 x 500mm ST4 mix concrete foundation

#### NOTES

1. All Softwood pressure impregnated to BS 1282 (1975)
2. All steel fixing and fixtures galv. steel to BS 729 (1986)
3. Can also be constructed with driven posts tops of which are weathered after driving.

Source: LUC

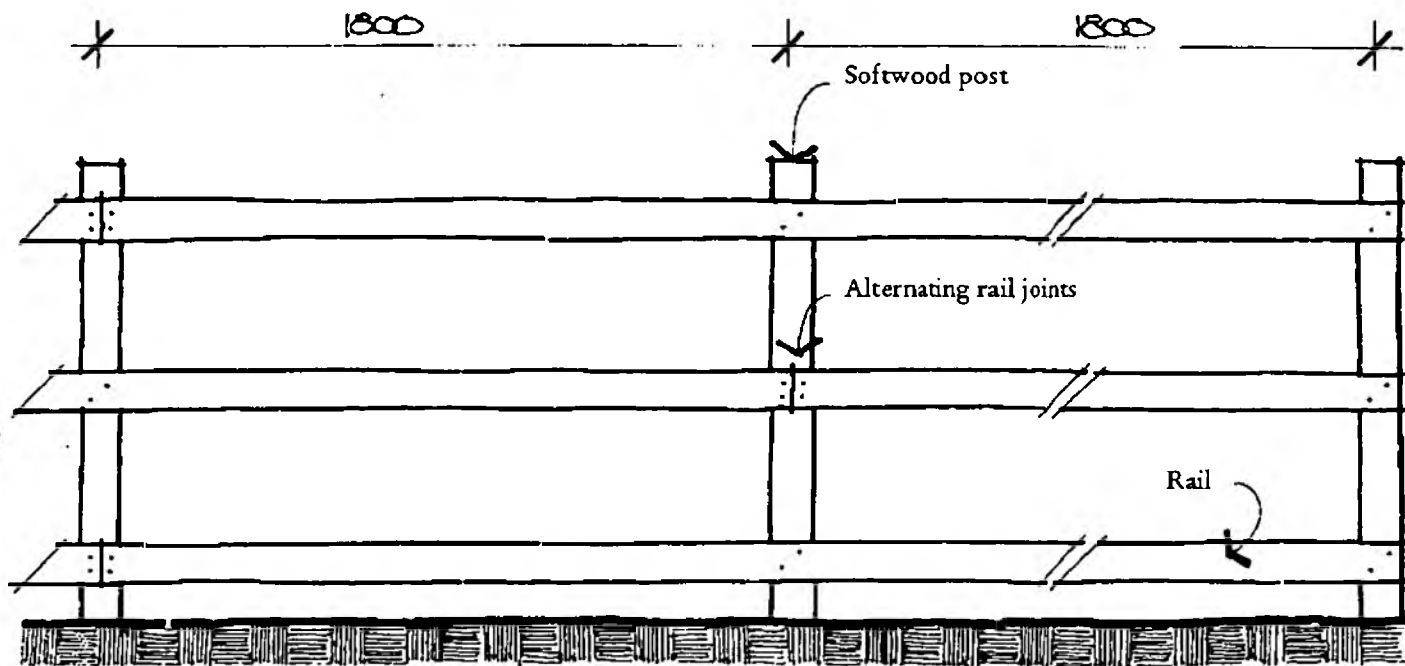
Refer to: 2.4.1 Fencing: Design guidelines / 2.5.6 Step stile / 2.5.7 Cross-bar stile

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
<p>●</p> <p>Low + Medium • High –</p>	<p>●</p> <p>Good + Medium • Poor –</p>	<p>●</p> <p>Good + Medium • Poor –</p>	<p>●</p> <p>Low + Medium • High –</p>	<p>●</p> <p>Good + Medium • Poor –</p>	<p>●</p> <p>Good + Medium • Poor –</p>	<p><b>R/S</b></p> <p>Rural R Semi-rural S Urban U</p>

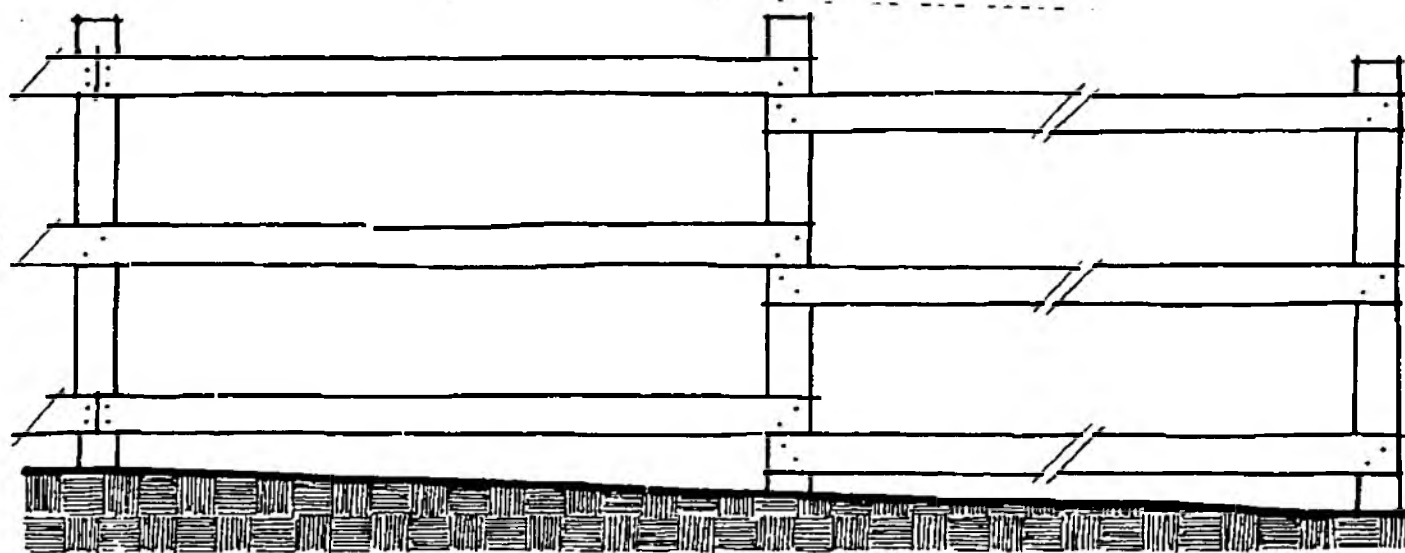
## 2.4 STRUCTURES: FENCING

### 2.4.5 TIMBER POST AND RAIL

SCALE 1:20 2 OF 2



Post and rail elevation level ground



Staggered post and rail for sloping ground

Source: LUC

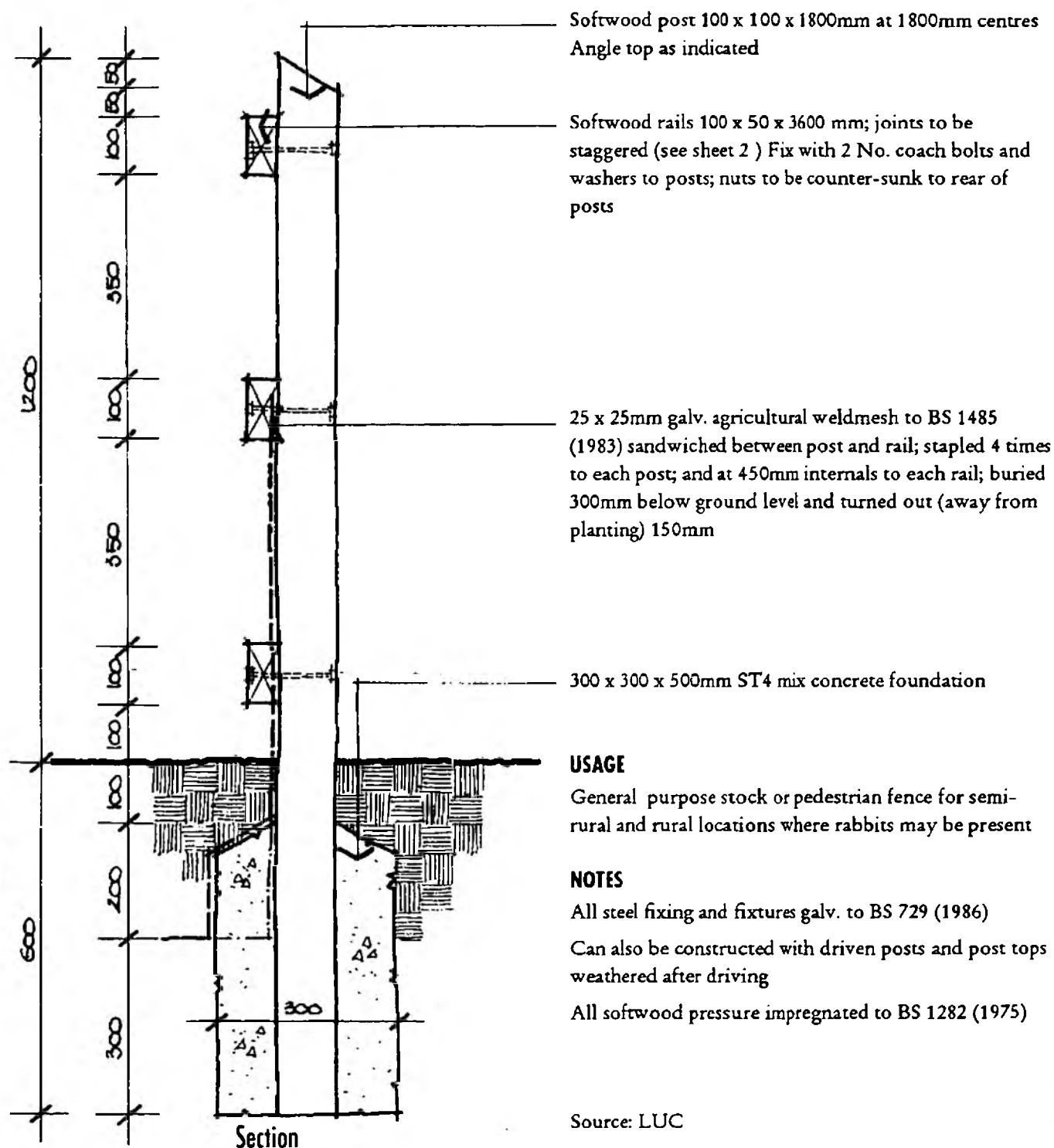
Refer to: 2.4.1 Fencing: Design guidelines / 2.5.6 Step stile / 2.5.7 Cross-bar stile

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
<ul style="list-style-type: none"> <li>Low +</li> <li>Medium •</li> <li>High –</li> </ul>	<ul style="list-style-type: none"> <li>Good +</li> <li>Medium •</li> <li>Poor –</li> </ul>	<ul style="list-style-type: none"> <li>Good +</li> <li>Medium •</li> <li>Poor –</li> </ul>	<ul style="list-style-type: none"> <li>Low +</li> <li>Medium •</li> <li>High –</li> </ul>	<ul style="list-style-type: none"> <li>Good +</li> <li>Medium •</li> <li>Poor –</li> </ul>	<ul style="list-style-type: none"> <li>Good +</li> <li>Medium •</li> <li>Poor –</li> </ul>	<b>R/S</b> Rural R Semi-rural S Urban U

## 2.4 STRUCTURES: FENCING

### 2.4.6 TIMBER POST/RAIL WITH RABBIT MESH

SCALE 1:10 1 OF 1



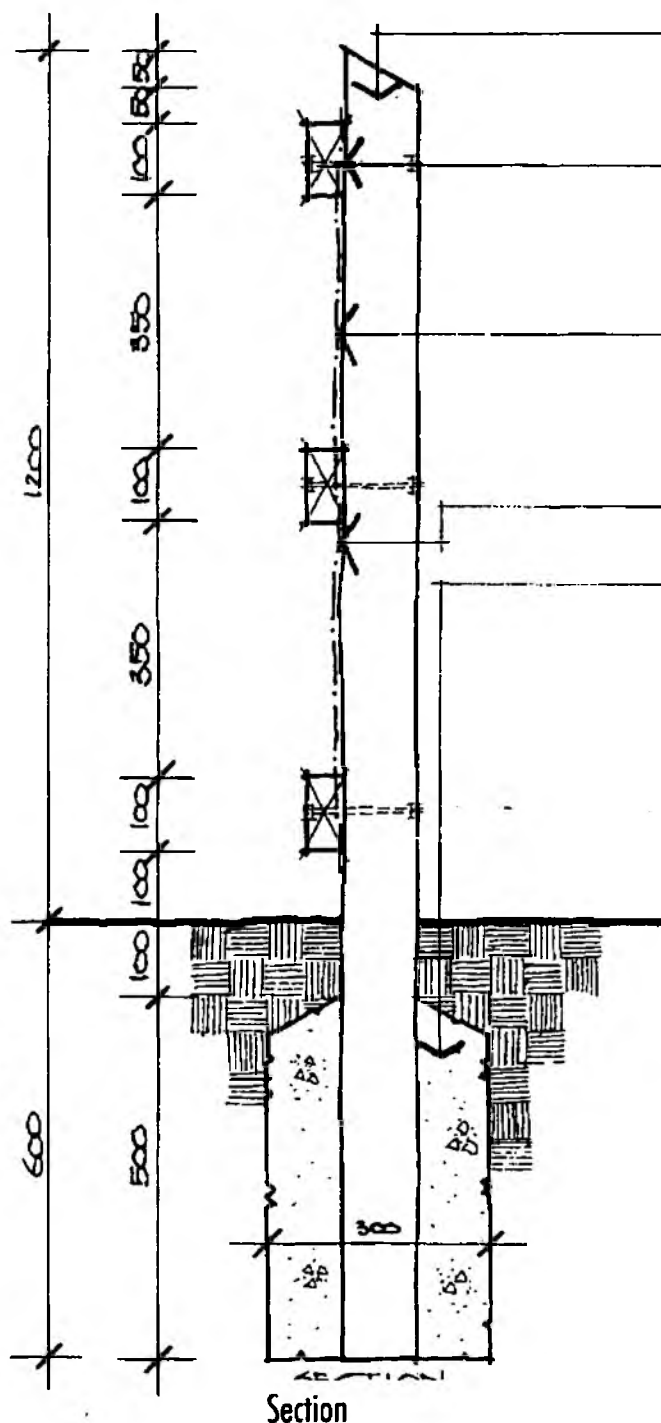
Refer to: 2.4.1 Fencing: Design guidelines / 2.5.6 Step stile / 2.5.7 Cross-bar stile

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
● Low + Medium ● High —	● Good + Medium ● Poor —	● Good + Medium ● Poor —	● Low + Medium ● High —	● Good + Medium ● Poor —	Good + Medium ● Poor —	<b>R/S</b> Rural R Semi-rural S Urban U

## 2.4 STRUCTURES: FENCING

### 2.4.7 TIMBER POST & RAIL WITH STOCK MESH

SCALE 1:20 1 OF 2



Softwood post 100 x 100 x 1800mm at 1800mm centres.  
Angle top as indicated

Softwood rail 100 x 50 x 3600mm; joints to be staggered  
(see sheet 2); fix with 2 no. coach bolts and washers to  
posts; nuts to be countersunk to rear of posts

Stock netting (sheep netting). All wire to BS 443. Supplied  
in 900mm height. Roll wire diameter and gauge to be  
specified.

Optional 2 ply 25 dia. staples to post

300 x 300 x 500mm ST4 mix concrete foundation

#### Usage

Suitable for rural and semi-rural locations

#### Notes

1. All softwood pressure impregnated to BS 1282 (1975)
2. All steel fixing and fixtures galv. steel to BS 729 (1986)
3. Can also be constructed with driven posts, tops of  
which are weathered after driving

Source: LUC

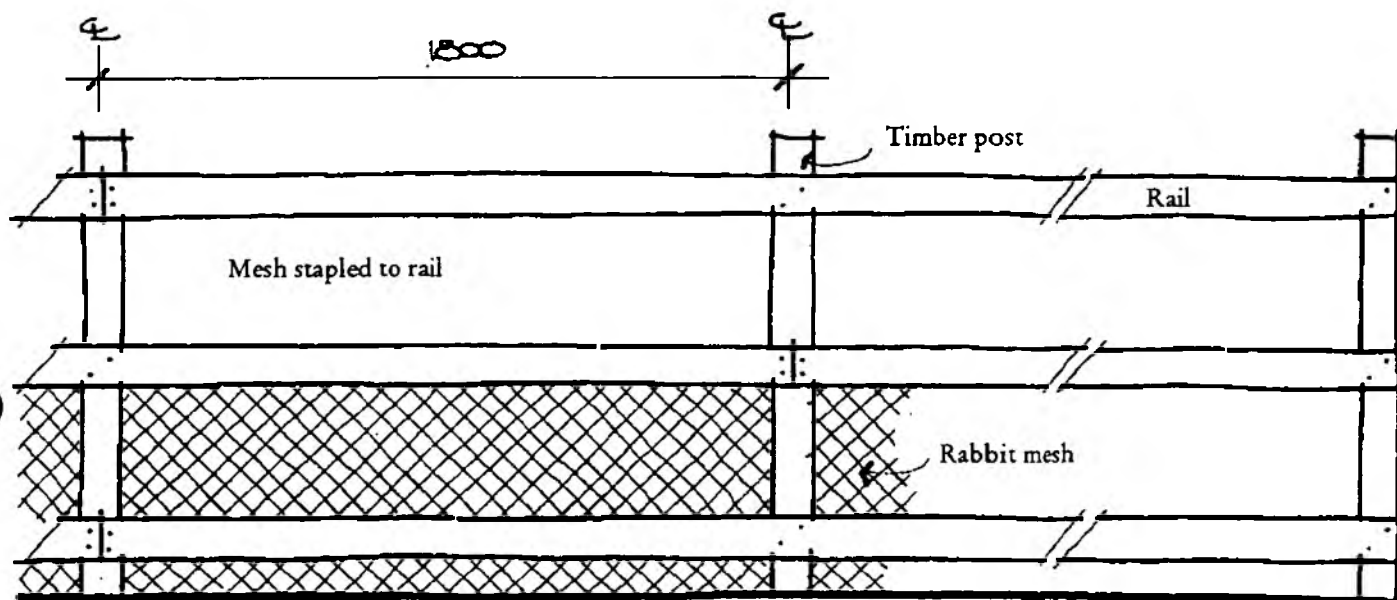
Refer to: 2.4.1 Fencing: Design guidelines / 2.5.6 Step stile / 2.5.7 Cross-bar stile

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
● Low + Medium ● High -	● Good + Medium ● Poor -	● Good + Medium ● Poor -	● Low + Medium ● High -	● Good + Medium ● Poor -	Good + Medium ● Poor -	<b>R/S</b>  Rural R Semi-rural S Urban U

## 2.4 STRUCTURES: FENCING

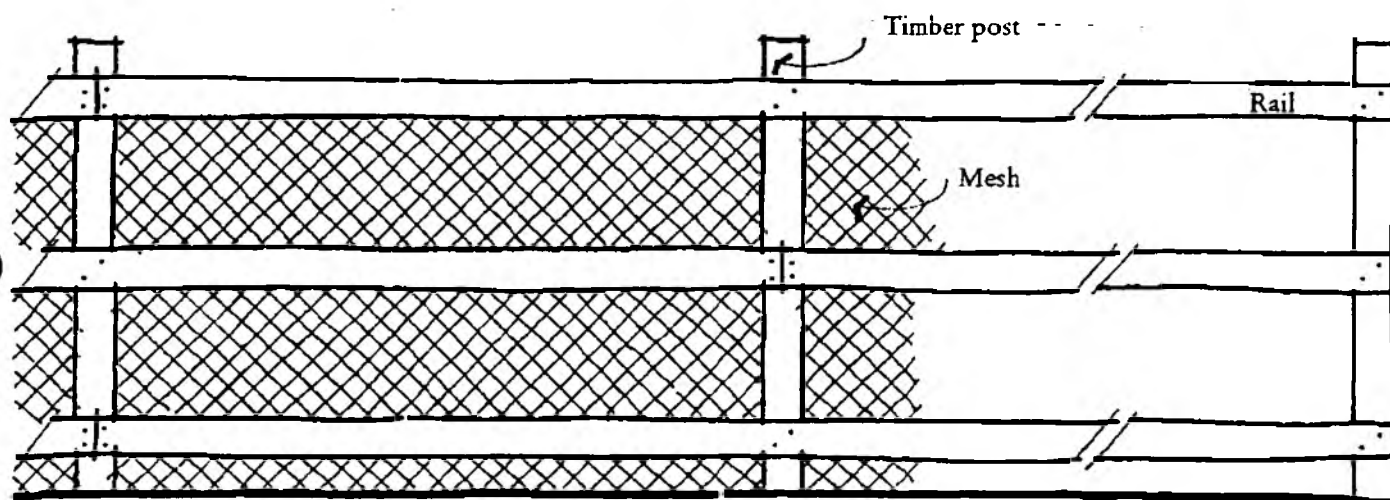
### 2.4.7 TIMBER POST/RAIL WITH MESH

SCALE 1:10 2 OF 2



Timber post and rail with rabbit mesh (see 2.4.6)

Mesh to extend 150mm below ground



Timber post and rail with stock mesh (see 2.4.7)

Elevation

Source: LUC

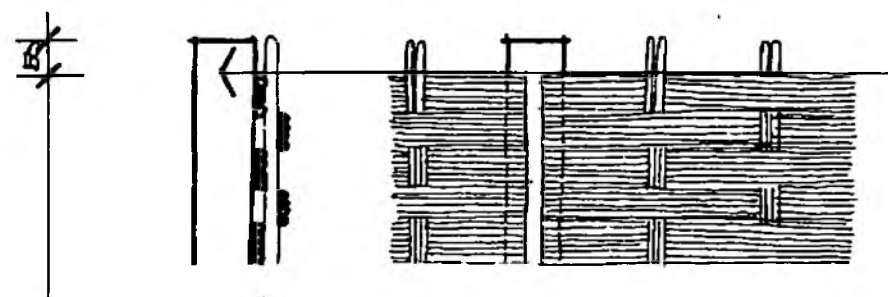
Refer to: 2.4.1 Fencing: Design guidelines / 2.5.6 Step stile / 2.5.7 Cross-bar stile

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
• Low + Medium • High –	• Good + Medium • Poor –	• Good + Medium • Poor –	• Low + Medium • High –	• Good + Medium • Poor –	Good + Medium • Poor –	<b>R/S</b> Rural R Semi-rural S Urban U

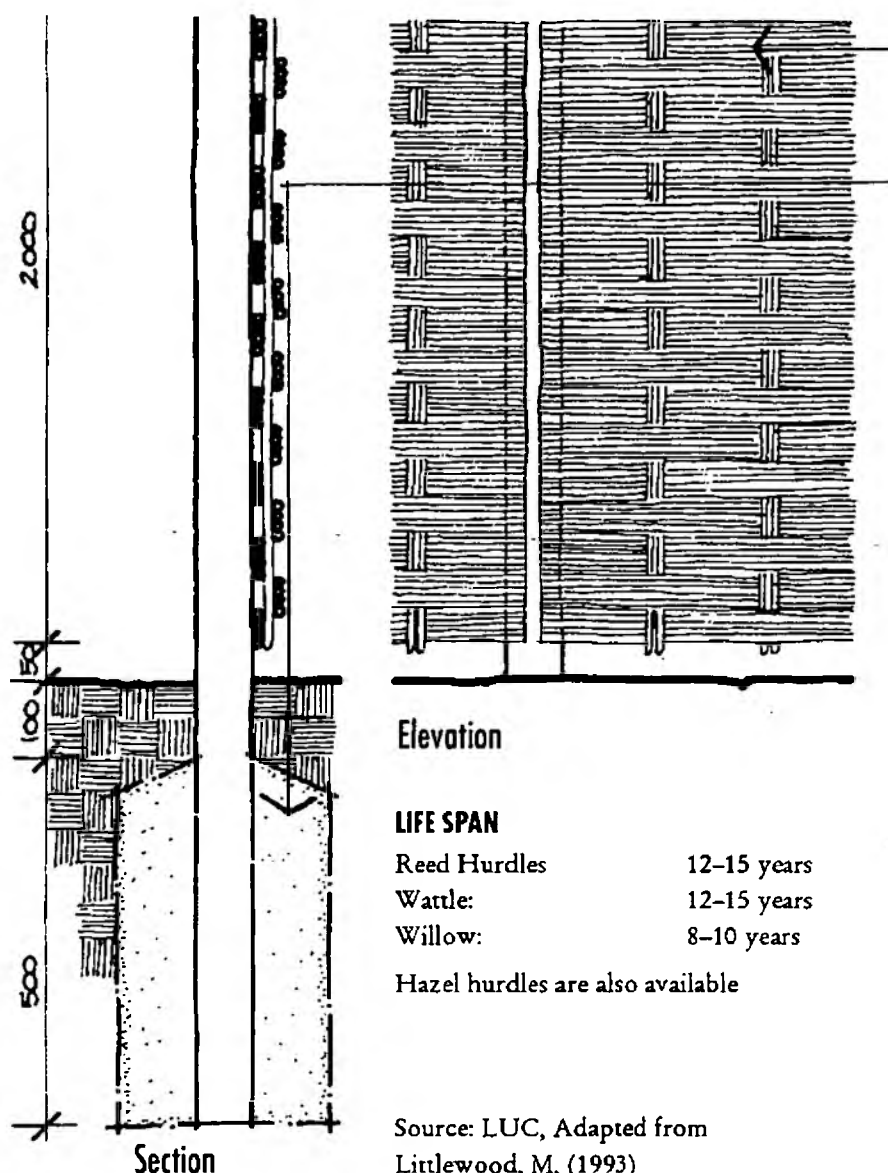
## 2.4 STRUCTURES: FENCING

### 2.4.8 OSIER HURDLES

SCALE 1:10 1 OF 1



Rounded softwood stakes 75 x 2400mm at 2000mm centres



Osier (willow) hurdles 2000 x 2000mm, wired to stake with galv. 1.5mm wire at 300mm c/cs

Foundation to be compacted hardcore or ST4 concrete mix 500 x 300 x 300mm

Elevation

#### LIFE SPAN

Reed Hurdles 12-15 years

Wattle: 12-15 years

Willow: 8-10 years

Hazel hurdles are also available

Source: LUC, Adapted from Littlewood, M, (1993)

#### USAGE

Screen fence in rural locations

#### NOTES

Timber stakes to be pressure impregnated to BS 1282 (1975)

Fence must always be erected vertically and not slanted to follow ground contours. Stepping down slopes is possible but tends to look inappropriate.

Consider wind loading on exposed sites.

All hurdles are normally available in 2m long panels at three heights: 1.0, 1.5 and 2.0m

Refer to: 2.4.1 Fencing: Design guidelines / 2.5 Gates and stiles

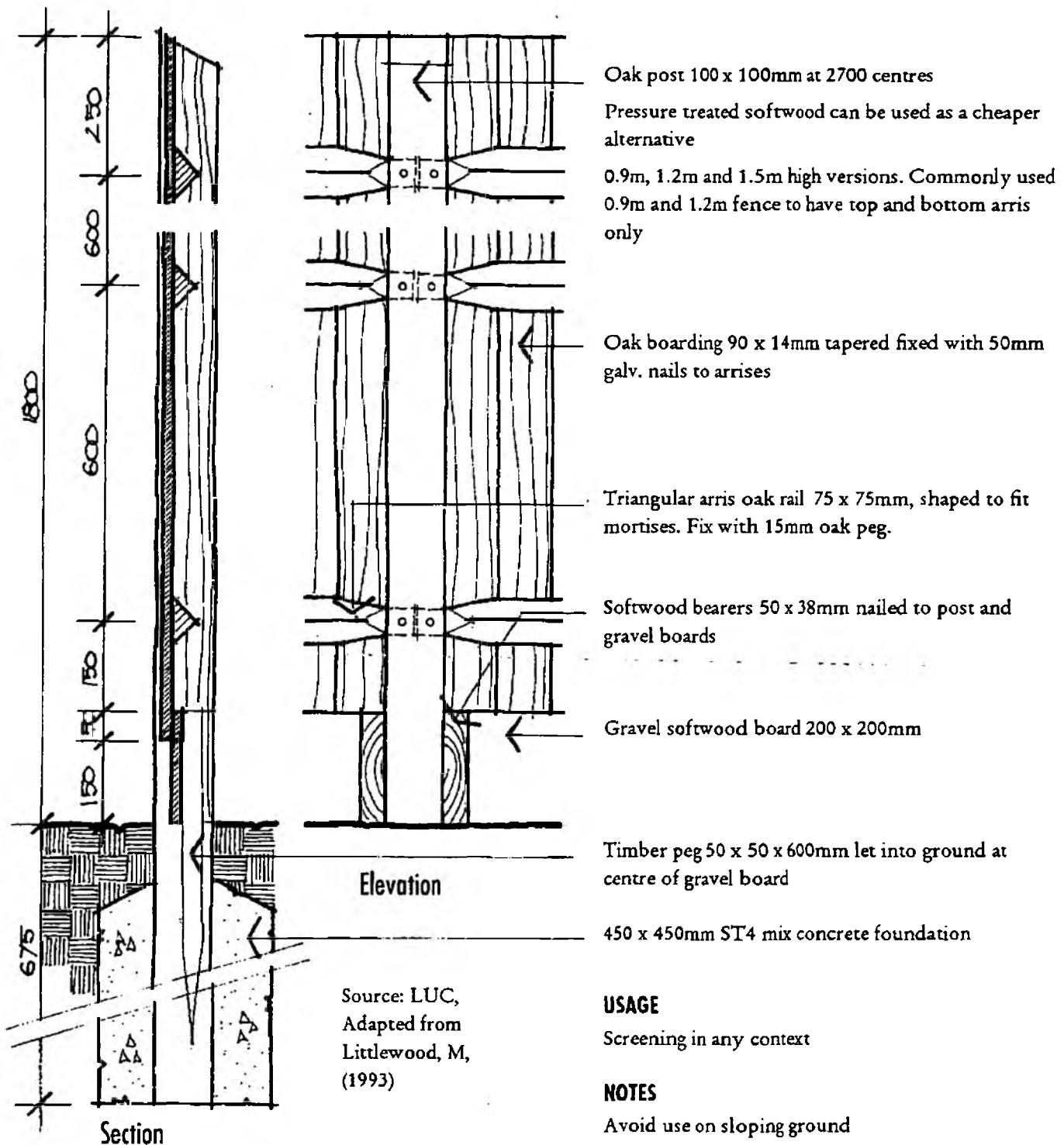
Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
•	+	-	•	+		<b>R/S</b>
Low + Medium • High -	Good + Medium • Poor -	Good + Medium • Poor -	Low + Medium • High -	Good + Medium • Poor -	Good + Medium • Poor -	Rural R Semi-rural S Urban U



## 2.4 STRUCTURES: FENCING

### 2.4.9 CLOSE BOARDED FENCE

SCALE 1:10 1 OF 1



Refer to: 2.4.1 Fencing: Design guidelines / 2.5.8 Close boarded timber gate

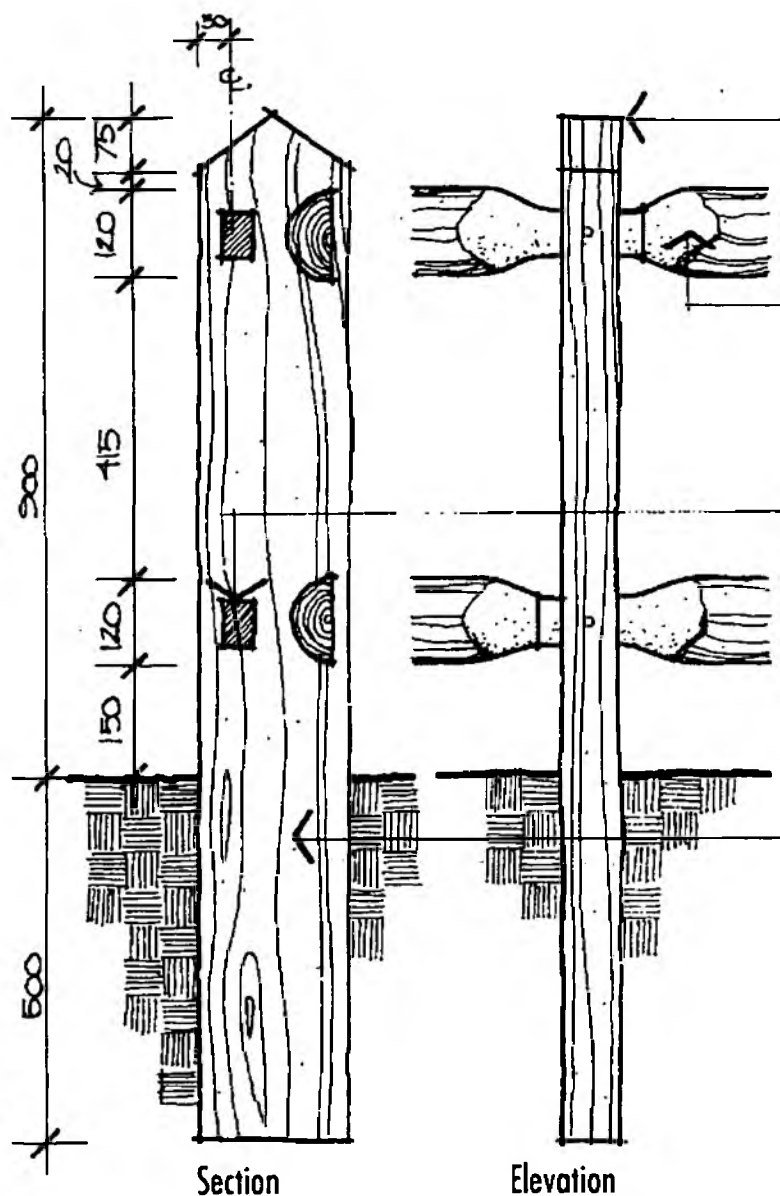
Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
<ul style="list-style-type: none"> <li>Low +</li> <li>Medium •</li> <li>High -</li> </ul>	<ul style="list-style-type: none"> <li>Good +</li> <li>Medium •</li> <li>Poor -</li> </ul>	<ul style="list-style-type: none"> <li>Good +</li> <li>Medium •</li> <li>Poor -</li> </ul>	<ul style="list-style-type: none"> <li>Low +</li> <li>Medium •</li> <li>High -</li> </ul>	<ul style="list-style-type: none"> <li>Good +</li> <li>Medium •</li> <li>Poor -</li> </ul>	<ul style="list-style-type: none"> <li>Good +</li> <li>Medium •</li> <li>Poor -</li> </ul>	<b>R/S/U</b> Rural R Semi-rural S Urban U

## 2.4 STRUCTURES: FENCING

### 2.4.10 SUSSEX POST AND RAIL

SCALE 1:10

1 OF 1



Oak post 200 x 75 x 1400mm. Set at 2700 centres, top twice weathered

Cleft oak rails, bark left until last 125mm on face ends shaped to completely fill mortices in posts. Secure rail with 15mm oak dowel

Mortice 60 x 40mm

Post set in augered hole and backfilled with well rammed coarse aggregate

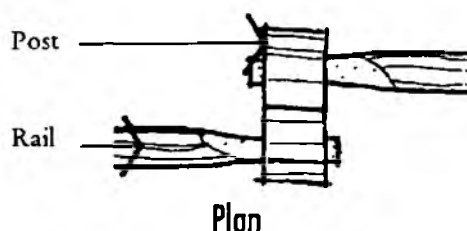
#### USAGE

1. High cost alternative to timber post and rail
2. Use in rural locations where style forms part of the local vernacular
3. Not totally stock proof

#### NOTES

Oak must be well seasoned and even so warp and mortices may need checking after 1–2 years. However, resultant fence is strong in character.

Source: LUC,  
Adapted from  
Littlewood, M,  
(1993).



Refer to: **2.4.1 Fencing: Design guidelines / 2.5 Gates and stiles**

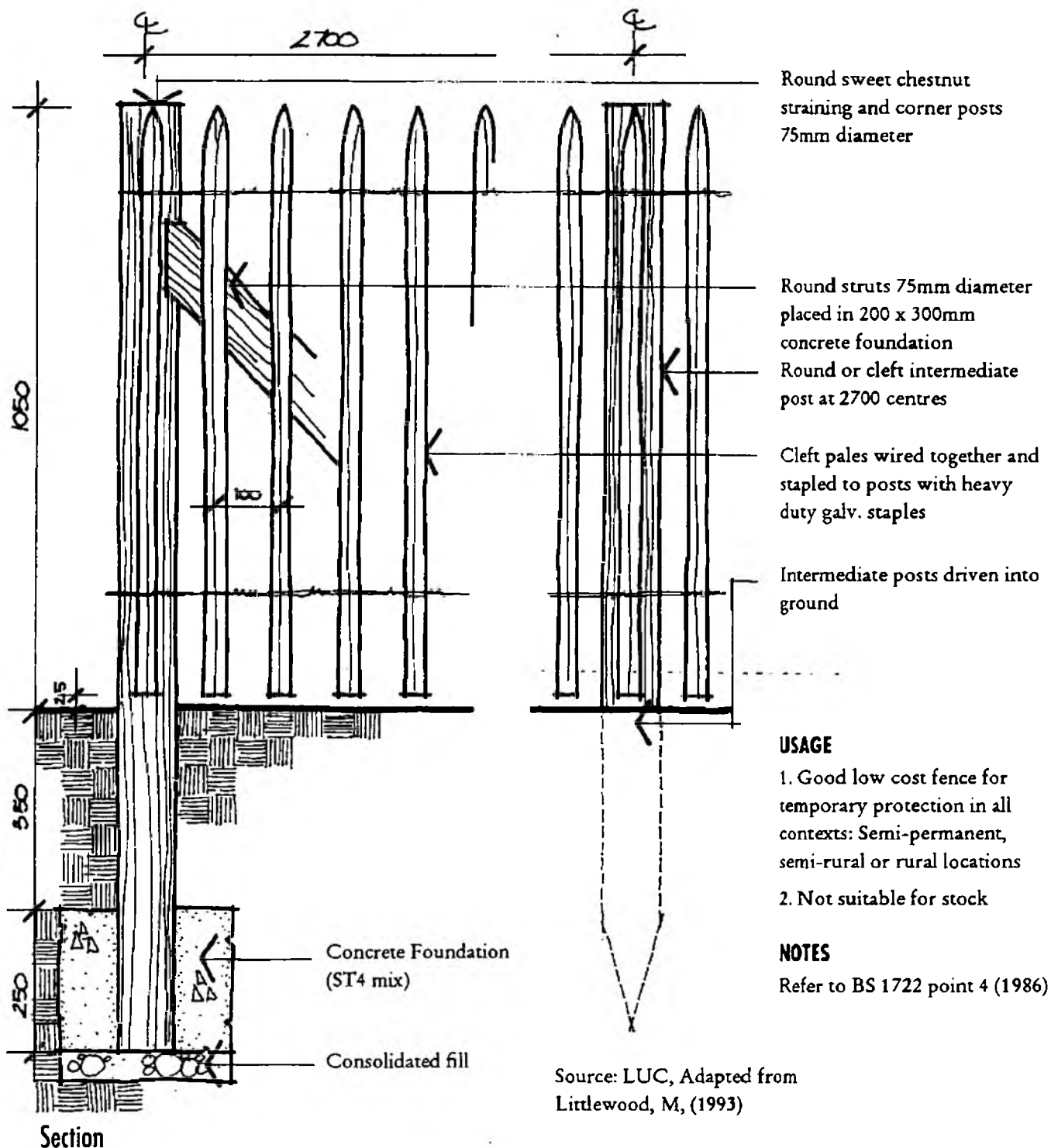
Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
–	•	+	•	•		<b>R</b>
Low + Medium • High –	Good + Medium • Poor –	Good + Medium • Poor –	Low + Medium • High –	Good + Medium • Poor –	Good + Medium • Poor –	Rural <b>R</b> Semi-rural <b>S</b> Urban <b>U</b>

## 2.4 STRUCTURES: FENCING

### 2.4.11 STRAINED CHESTNUT PALE

SCALE 1:10

1 OF 1



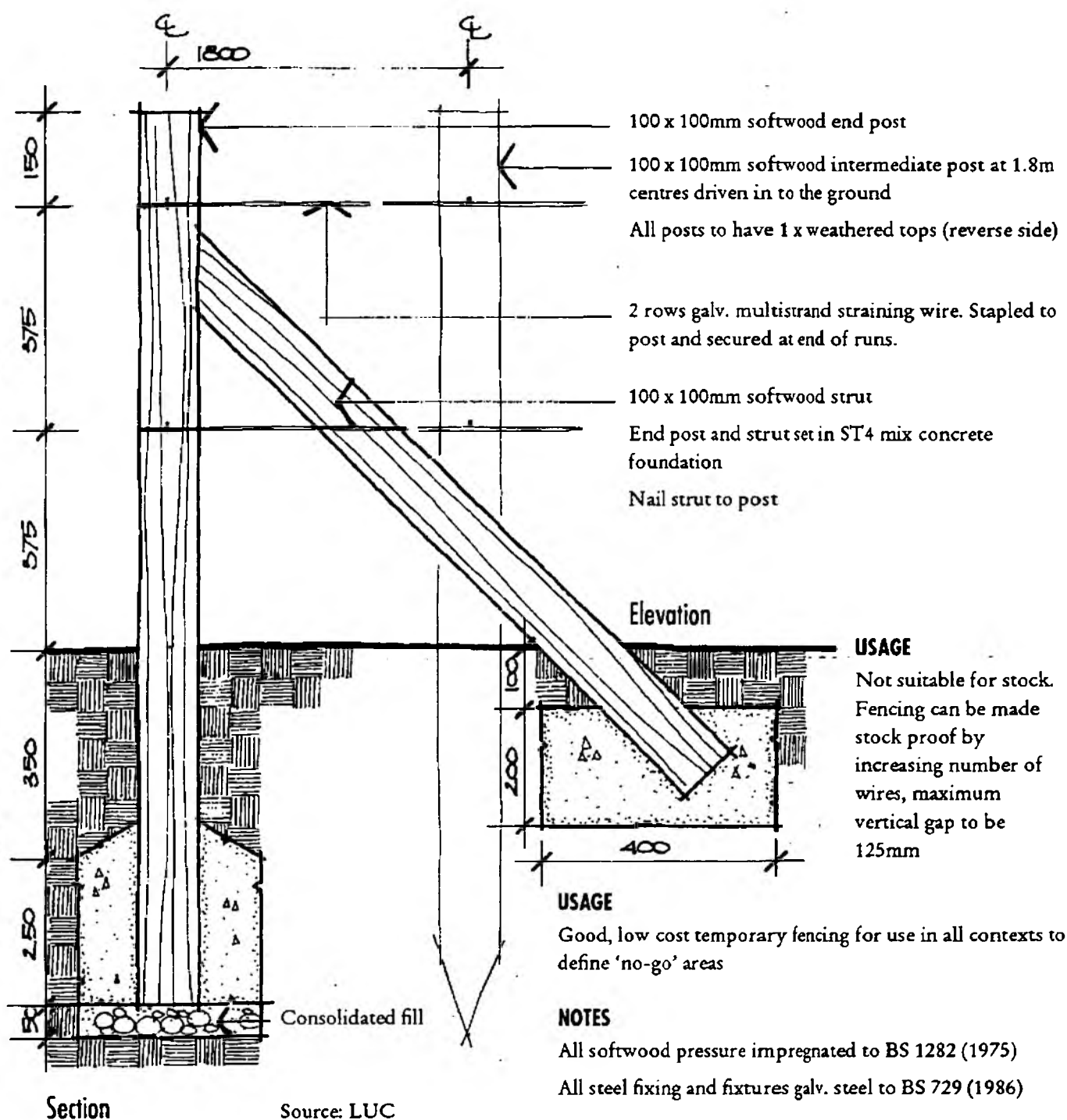
Refer to: 2.4.1 Fencing: Design guidelines / 2.5 Gates and stiles

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
+	+	-	•	•		<b>R/S/U</b>
Low + Medium • High -	Good + Medium • Poor -	Good + Medium • Poor -	Low + Medium • High -	Good + Medium • Poor -	Good + Medium • Poor -	Rural R Semi-rural S Urban U

## 2.4 STRUCTURES: FENCING

### 2.4.12 TENSIONED WIRE FENCING

SCALE 1:10 1 OF 1



Refer to: 2.4.1 Fencing: Design guidelines / 2.5 Gates and stiles

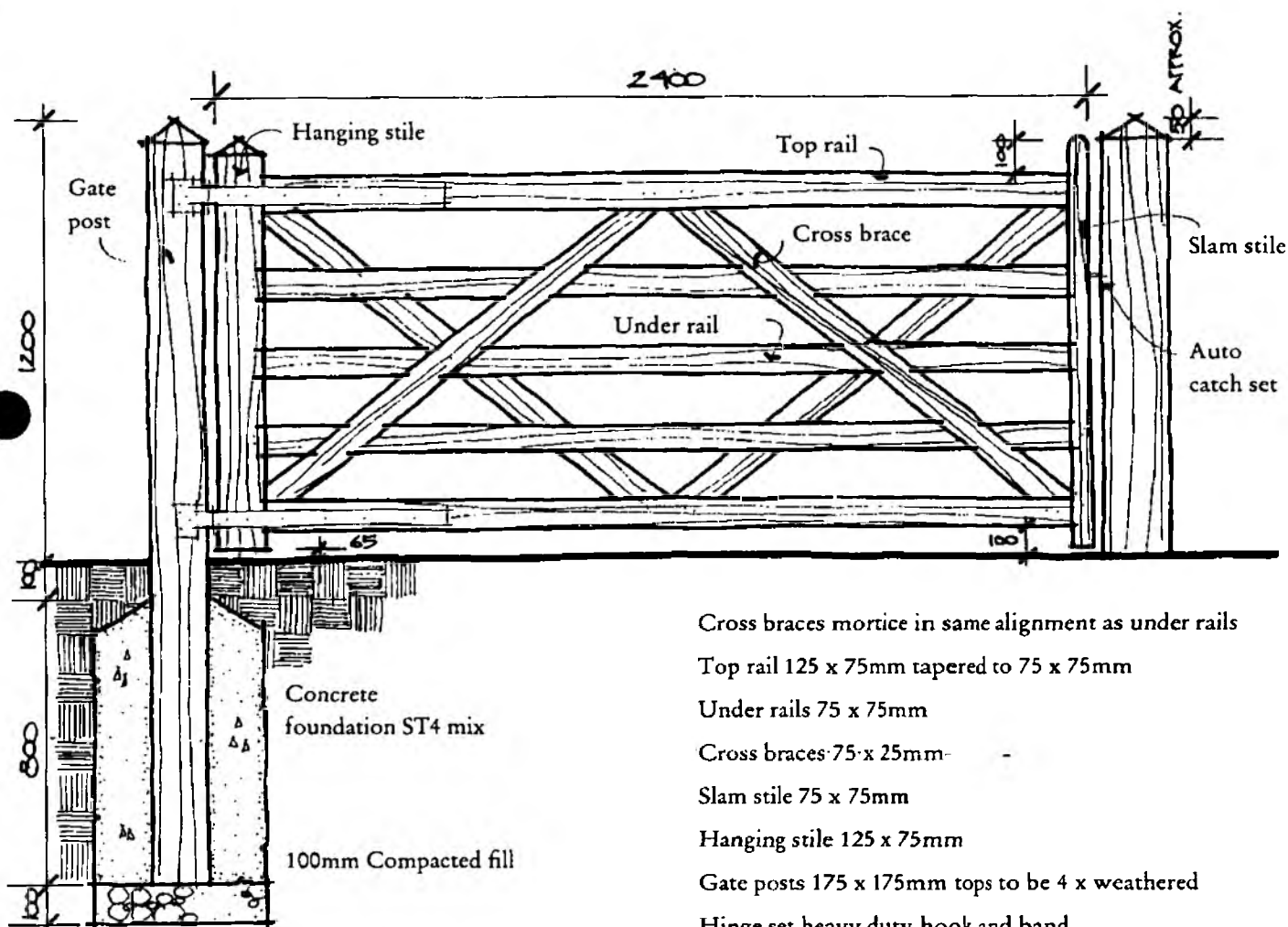
Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
+	+	•	•	+		<b>R/S</b>
Low + Medium • High -	Good + Medium • Poor -	Good + Medium • Poor -	Low + Medium • High -	Good + Medium • Poor -	Good + Medium • Poor -	Rural R Semi-rural S Urban U

## 2.5 STRUCTURES: GATES AND STILES

### 2.5.1 5 BAR TIMBER GATE

SCALE 1:20

1 OF 1



Elevation: Opening Forwards

Source: LUC

Cross braces mortice in same alignment as under rails

Top rail 125 x 75mm tapered to 75 x 75mm

Under rails 75 x 75mm

Cross braces 75 x 25mm

Slam stile 75 x 75mm

Hanging stile 125 x 75mm

Gate posts 175 x 175mm tops to be 4 x weathered

Hinge set heavy duty hook and band

#### NOTES

Softwood timber field gate. All joints morticed and tenoned.

All rails and cross braces bolted.

All softwood pressure impregnated to BS 1282 (1975)

All steel fixing and fixtures galv. steel to BS 729 (1986)

#### USAGE

Traditional style farm gate for rural and semi-rural locations.

Refer to: 1.8 Access for all / 2.4 Fencing

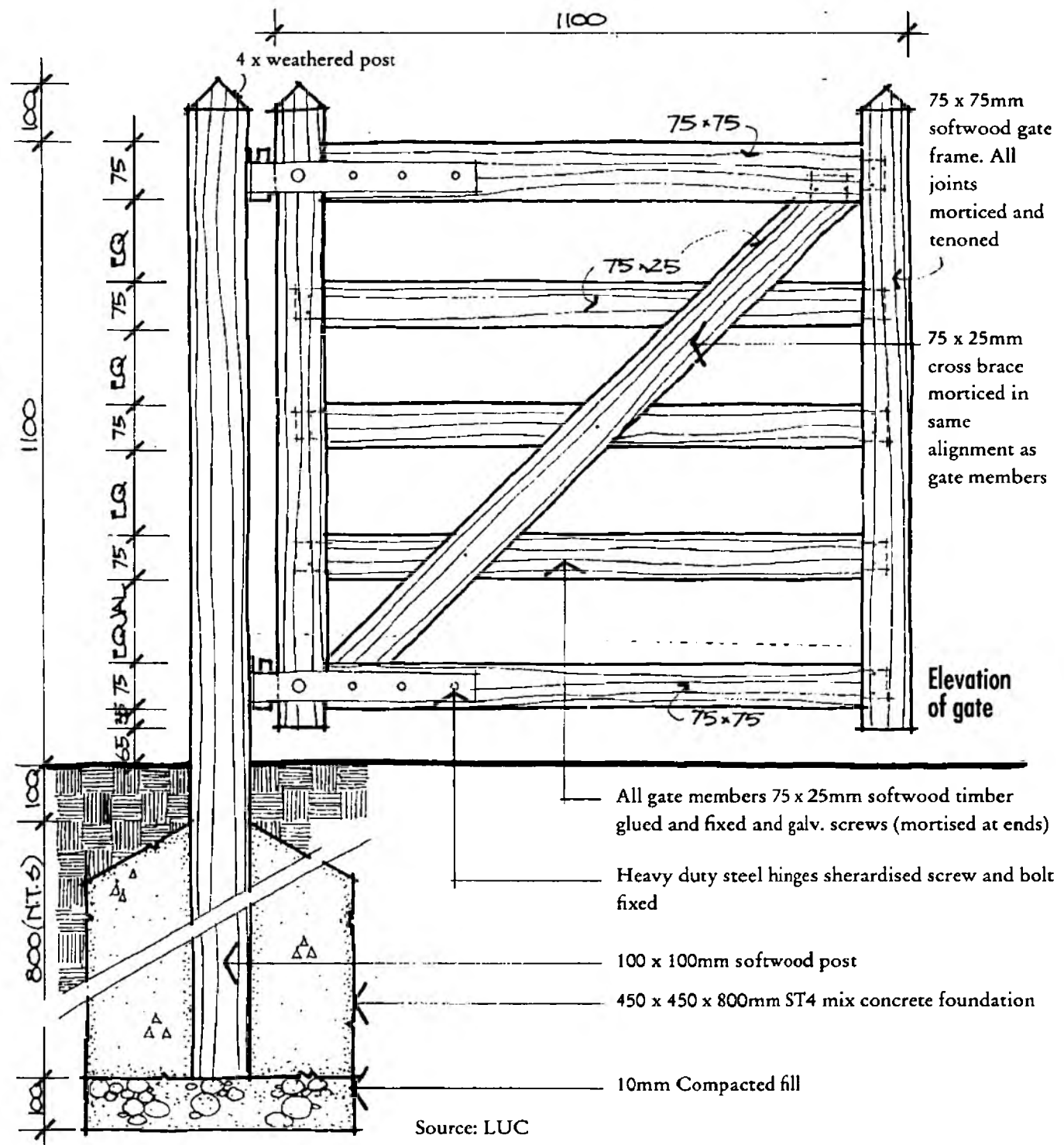
Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
•	+	+	+	+	•	<b>R/S</b>
Low + Medium • High -	Good + Medium • Poor -	Good + Medium • Poor -	Low + Medium • High -	Good + Medium • Poor -	Good + Medium • Poor -	Rural R Semi-rural S Urban U

## 2.5 STRUCTURES: GATES AND STILES

### 2.5.2 TIMBER KISSING GATE

SCALE 1:20

1 OF 2



Refer to: 1.8 Access for all / 2.4 Fencing

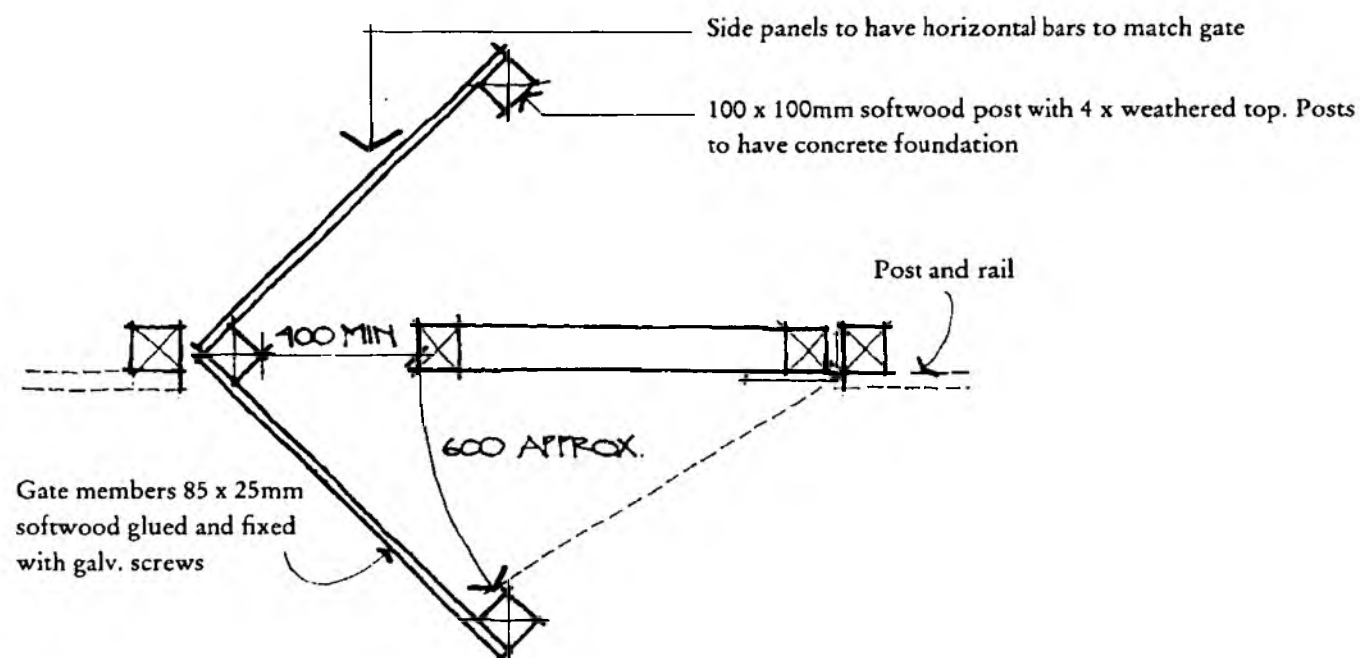
Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
+	+	+	+	+	•	<b>R/S</b>
Low + Medium • High –	Good + Medium • Poor –	Good + Medium • Poor –	Low + Medium • High –	Good + Medium • Poor –	Good + Medium • Poor –	Rural R Semi-rural S Urban U

## 2.5 STRUCTURES: GATES AND STILES

### 2.5.2 TIMBER KISSING GATE

SCALE 1:20

2 OF 2



Source: LUC

#### USAGE

Suitable for rural and semi-rural locations

Not suitable for wheelchair access

#### NOTES

All softwood pressure impregnated to BS 1282 (1975)

All steel fixing and fixtures galv. steel to BS 729 (1986)

Refer to: 1.8 Access for all / 2.4 Fencing

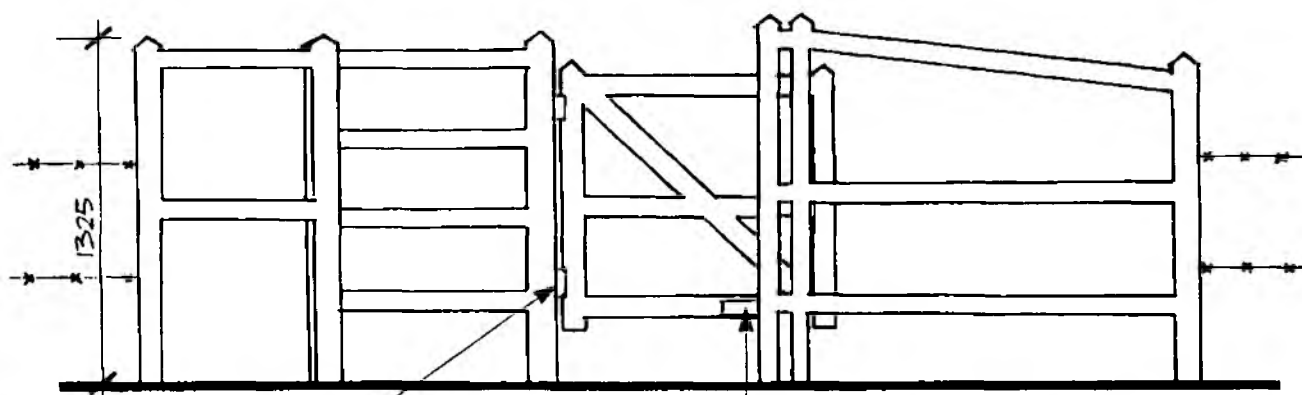
Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
+	+	+	+	+	•	<b>R/S</b>
Low + Medium • High -	Good + Medium • Poor -	Good + Medium • Poor -	Low + Medium • High -	Good + Medium • Poor -	Good + Medium • Poor -	Rural R Semi-rural S Urban U

## 2.5 STRUCTURES: GATES AND STILES

### 2.5.3 KISSING GATE FOR WHEELCHAIR USERS

NTS

1 OF 1



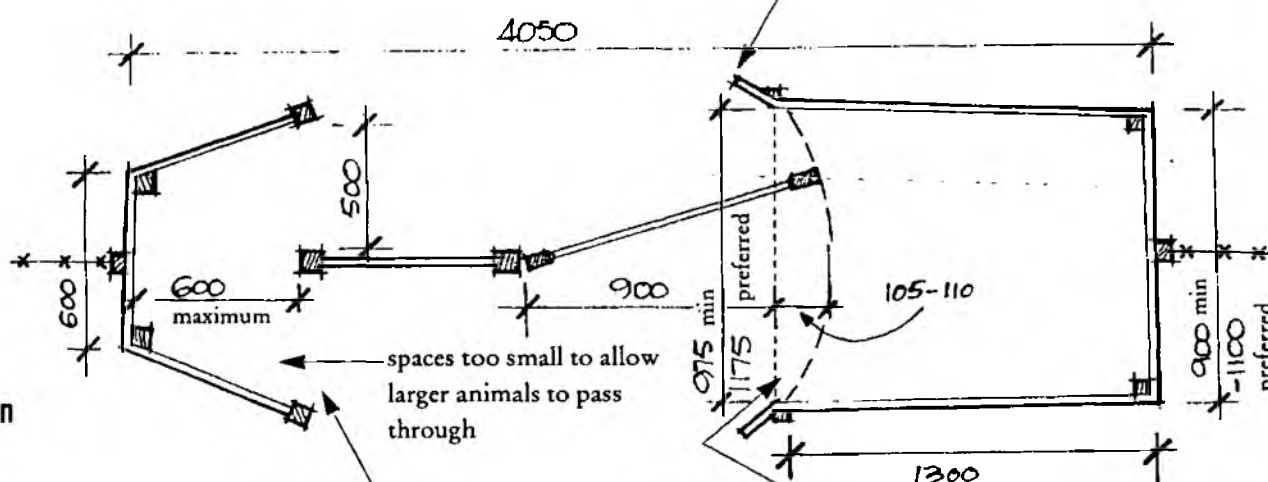
### Elevation

off-set hinge, or other self-closing mechanism to close the gate to one side.

**kick plate**

the gate can be self-constructed from treated timber as shown here, or a metal version may be purchased from the manufacturer.

ends face outwards for easy access



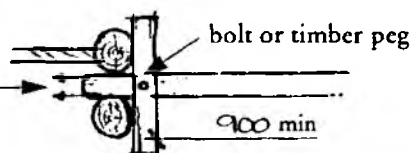
### Plan

- spaces too small to allow larger animals to pass through

helper or able-bodied user passes through this opening. A stile is a possible alternative to this.

wheelchair is pushed into recess, gate is swung in other direction and wheelchair is pulled out backwards. Alternatively the wheelchair may be self-propelled in and out.

post can slide out, space should be wide enough for cross-bar to move freely



Sources: Broxap and Corby Ltd, Countryside Commission (1994)

Refer to: **1.8 Access for all / 2.4 Fencing**

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
+	+	•	+	+	+	<b>R/S</b>
Low +	Good +	Good +	Low +	Good +	Good +	Rural R
Medium •	Medium •	Medium •	Medium •	Medium •	Medium •	Semirural S
High –	Poor –	Poor –	High –	Poor –	Poor –	Urban U

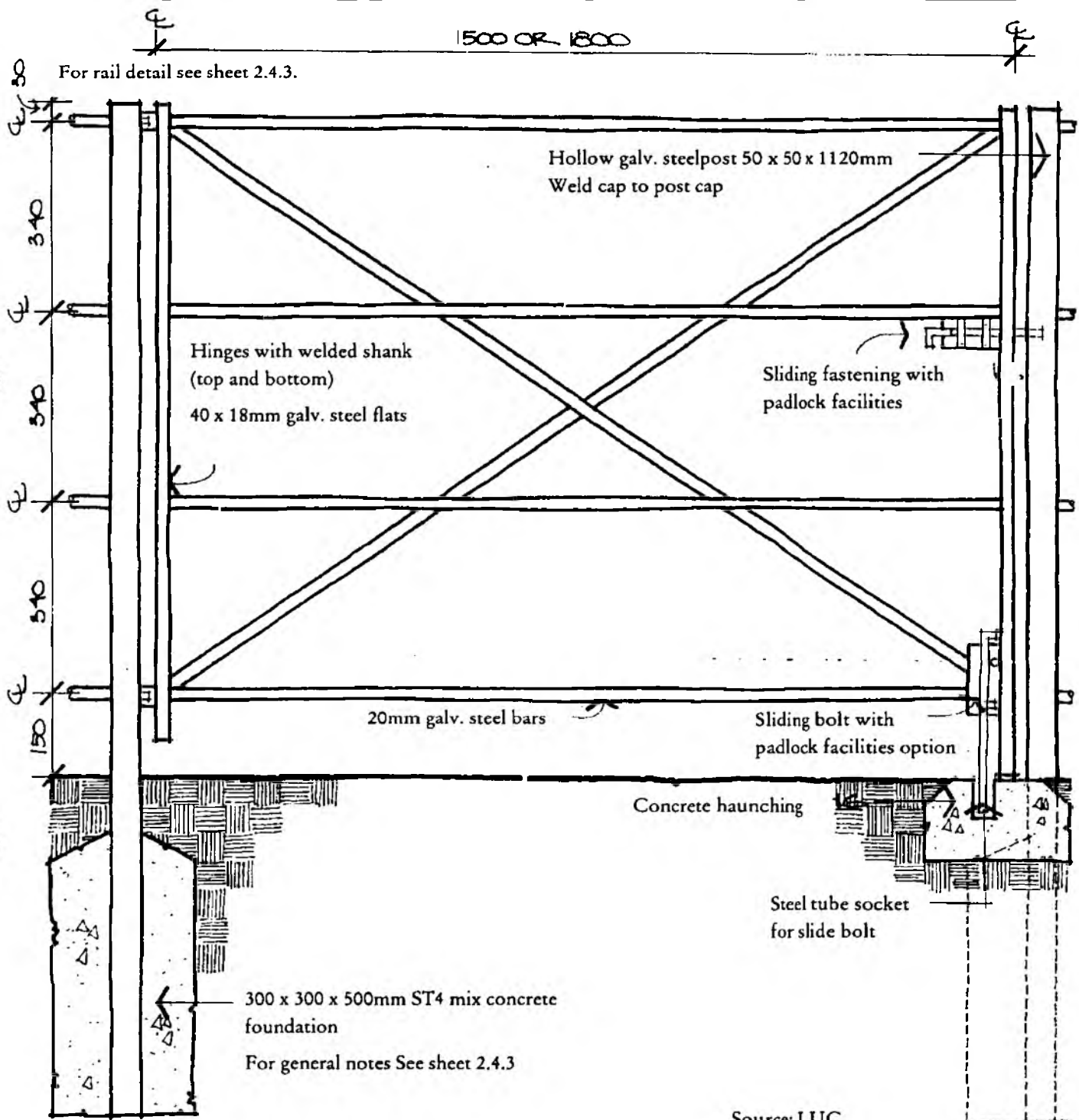


## 2.5 STRUCTURES: GATES AND STILES

### 2.5.4 STEEL PEDESTRIAN GATE

SCALE 1:10

1 OF 1



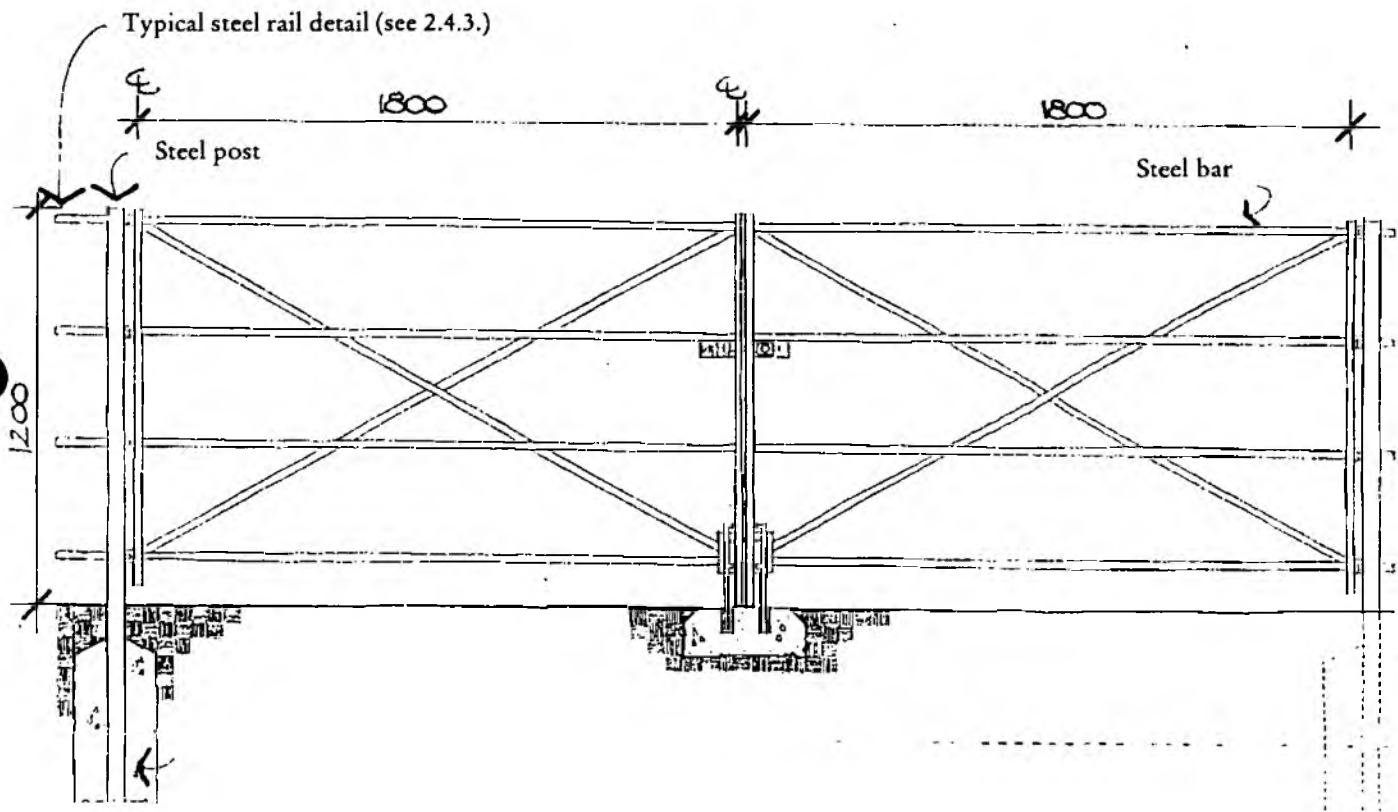
Refer to: 1.8 Access for all / 2.4.3 Steel parkland fence

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
●	●	●	●	●	+	<b>R/S</b>
Low + Medium ● High -	Good + Medium ● Poor -	Good + Medium ● Poor -	Low + Medium ● High -	Good + Medium ● Poor -	Good + Medium ● Poor -	Rural R Semi-rural S Urban U

2.5 STRUCTURES: GATES AND STILES

2.5.5 STEEL VEHICLE GATE

SCALE 1:20 1 OF 1



Source: LUC

NOTES

For all technical details see sheet 2.4.3.

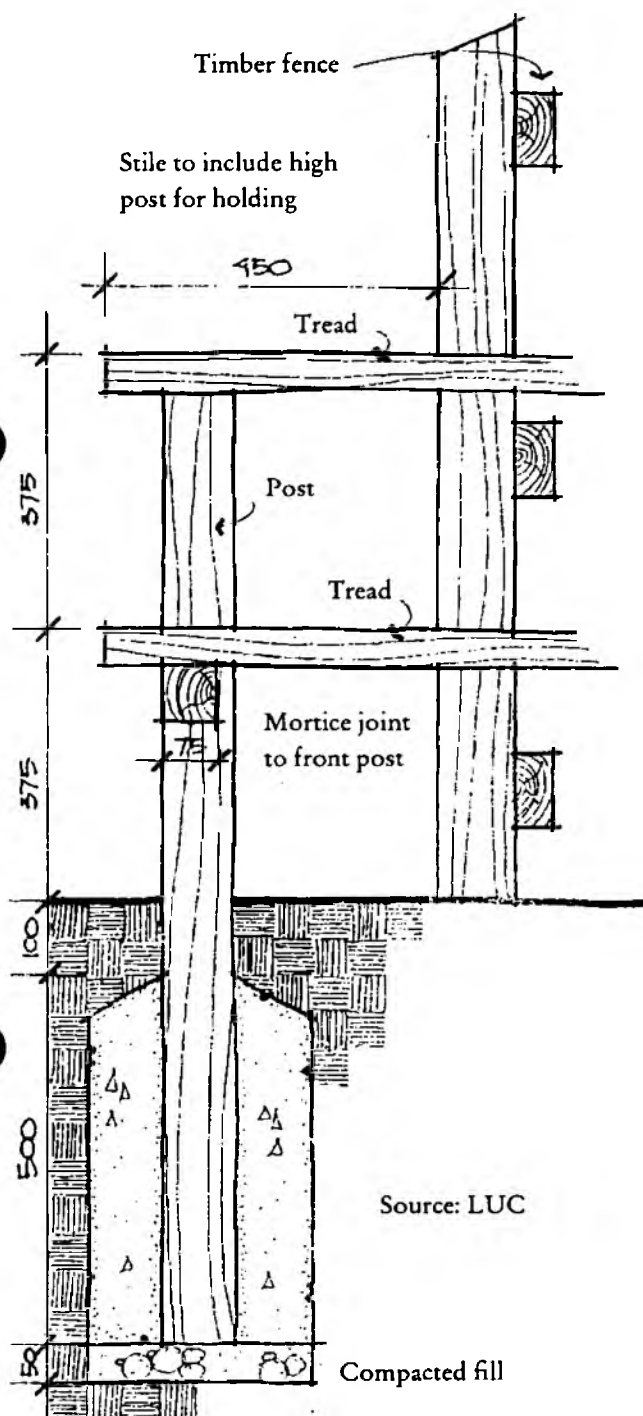
Refer to: 1.8 Access for all / 2.4.3 Steel parkland fencing

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
<p>●</p> <p>Low +</p> <p>Medium ●</p> <p>High -</p>	<p>●</p> <p>Good +</p> <p>Medium ●</p> <p>Poor -</p>	<p>●</p> <p>Good +</p> <p>Medium ●</p> <p>Poor -</p>	<p>●</p> <p>Low +</p> <p>Medium ●</p> <p>High -</p>	<p>●</p> <p>Good +</p> <p>Medium ●</p> <p>Poor -</p>	<p>+</p> <p>Good +</p> <p>Medium ●</p> <p>Poor -</p>	<p><b>R/S</b></p> <p>Rural R</p> <p>Semi-rural S</p> <p>Urban U</p>

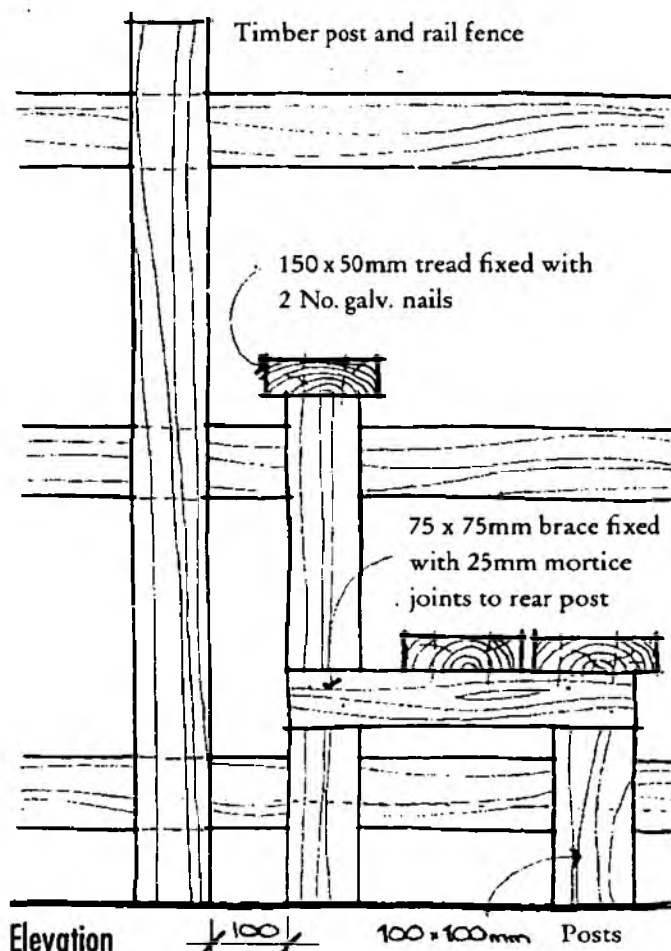
## 2.5 STRUCTURES: GATES AND STILES

### 2.5.6 STEP STILE

SCALE 1:10 1 OF 1



Section



#### NOTES

All softwood pressure impregnated to BS 1282 (1975)

All fixings to use galv. nails to BS 729 (1986)

Posts to be secured in 300 x 300 x 500mm concrete ST4 mix foundation or constructed with driven posts (taper ends)

#### USAGE

Suitable for rural and semi-rural locations

Broad lower step and right-angled layout provides ease of access over stile

Refer to: 1.8 Access for all / 2.4.5 Timber post and rail fence / 2.5.7 Cross bar stile

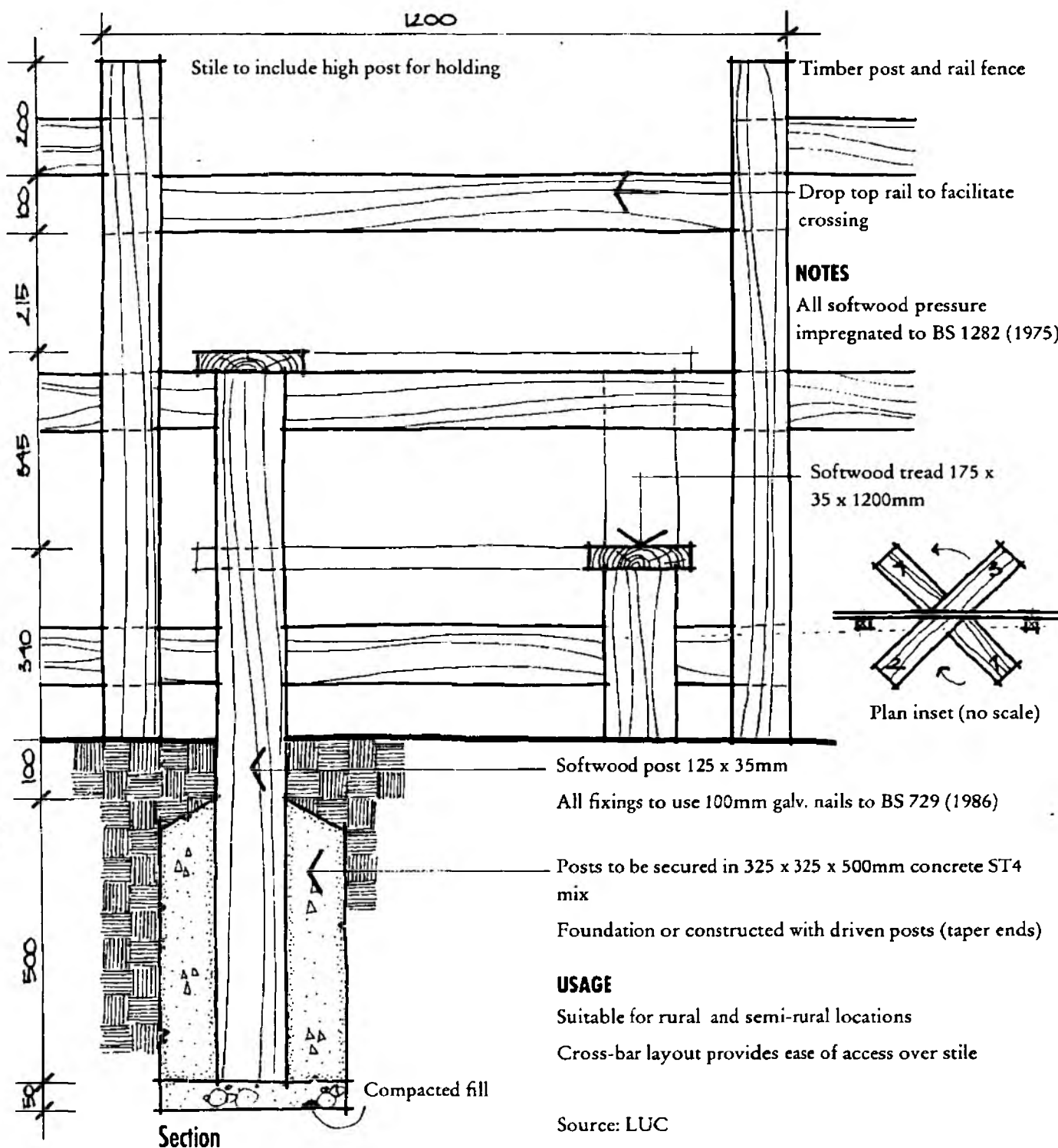
Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
+	+	+	+	+	-	<b>R/S</b>
Low + Medium • High -	Good + Medium • Poor -	Good + Medium • Poor -	Low + Medium • High -	Good + Medium • Poor -	Good + Medium • Poor -	Rural R Semi-rural S Urban U

## 2.5 STRUCTURES: GATES AND STILES

### 2.5.7 CROSS-BAR STILE

SCALE 1:10

1 OF 1



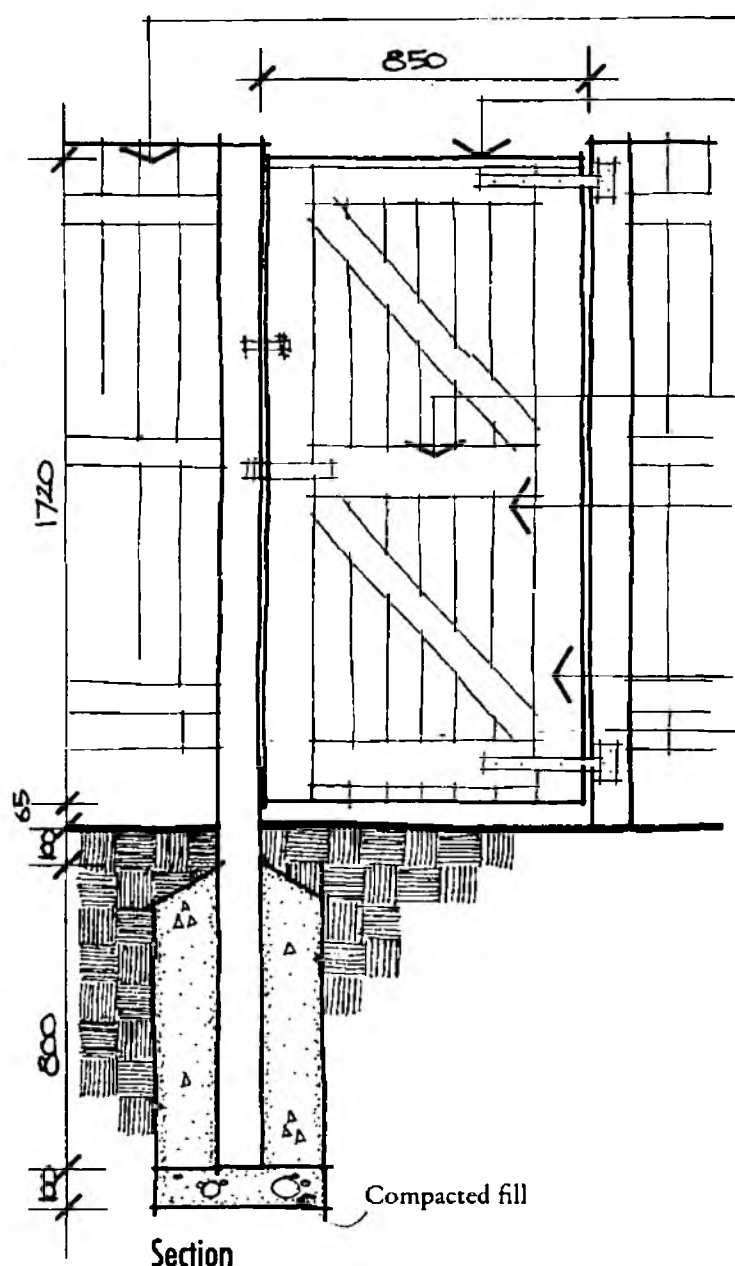
Refer to: 1.8 Access for all / 1.4.5 Timber post and rail / 2.5.6 Step stile

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
+	+	+	+	+	—	<b>R/S</b>
Low + Medium • High —	Good + Medium • Poor —	Good + Medium • Poor —	Low + Medium • High —	Good + Medium • Poor —	Good + Medium • Poor —	Rural R Semi-rural S Urban U

## 2.5 STRUCTURES: GATES AND STILES

### 2.5.8 CLOSE BOARDED TIMBER GATE

SCALE 1:20 1 OF 1



Close boarded fence, 1800mm (see sheet 2.4.9)

75 x 38mm 2 x weathered capping

Hinge 1 pair 300 light reversible with galv. finish  
35mm screw fixing

Latch heavy duty suffolk, galv.

Heavy duty 203mm galv. barrel bolt to take padlock

125 x 25 mm arris rails

75 x 25mm cross brace

90 x 14mm tapered oak boarding. Fix with 38mm  
galv. nails to arris rails

Door ledged and braced

125 x 50mm end frame

100 x 100mm closing and gate posts

450 x 450mm concrete ST4 mix foundation

#### USAGE

Suitable for all locations

#### NOTES

900, 1200 and 1500mm high versions are commonly  
used. 900 and 1200mm gate to have one cross-brace  
only

All timber to be oak. Alternatively, use pressure  
impregnated softwood to BS 1282 (1975)

All fixings and fastenings to be galv. to BS 729 (1986)

Source: LUC, Adapted from Littlewood, M, (1993)

Refer to: 1.8 Access for all / 2.4.9 Close boarded fence

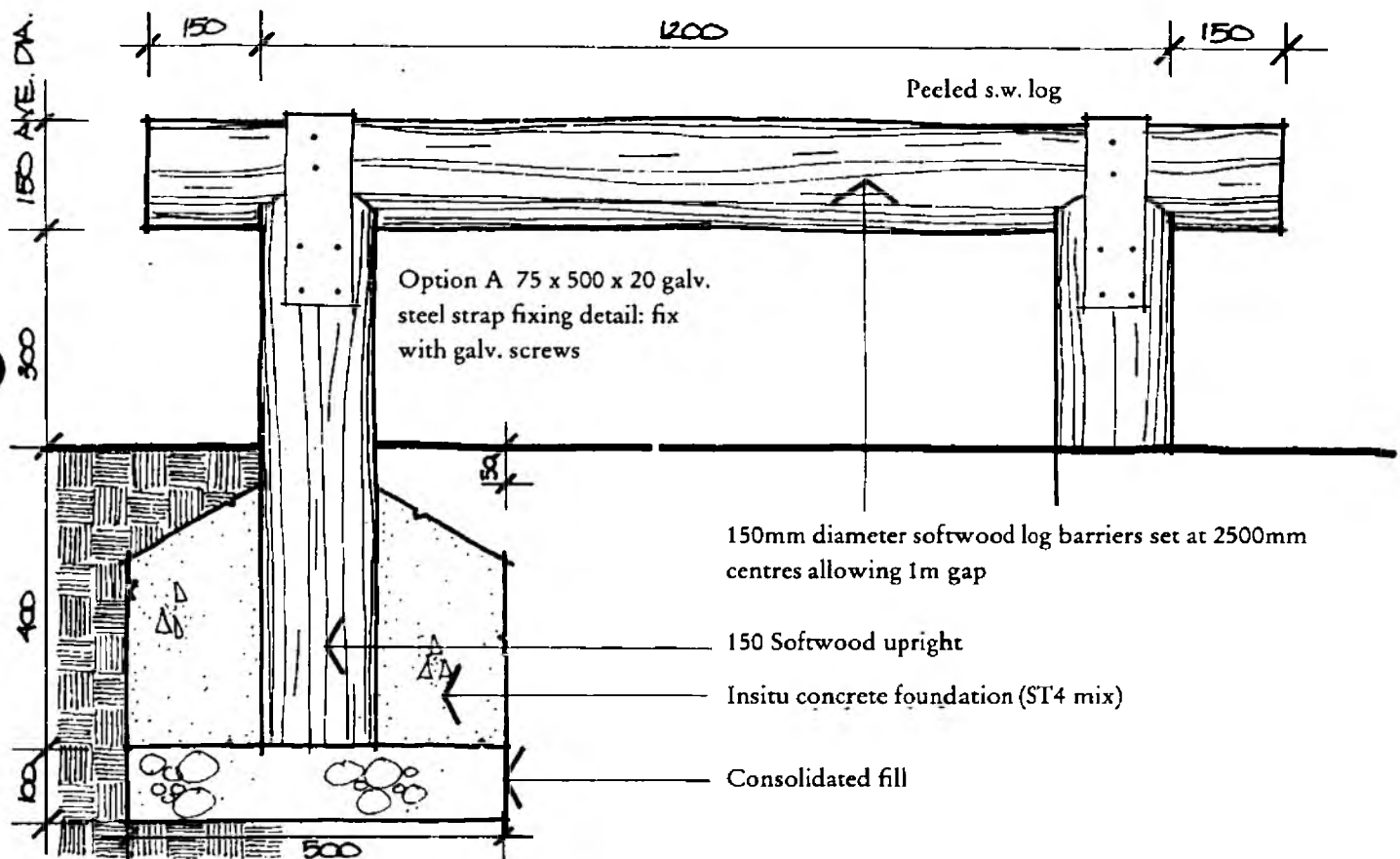
Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
● Low + Medium ● High —	● Good + Medium ● Poor —	● Good + Medium ● Poor —	● Low + Medium ● High —	● Good + Medium ● Poor —	● Good + Medium ● Poor —	<b>R/S/U</b>  Rural R Semi-rural S Urban U

## 2.6 STRUCTURES: BARRIERS AND HEIGHT RESTRICTORS

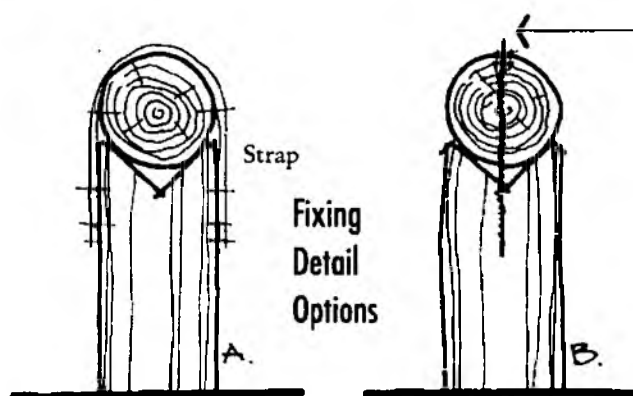
### 2.6.1 TIMBER VEHICLE BARRIERS

SCALE 1:10

1 OF 1



Section



Source: LUC

#### USAGE

Barriers used to delineate location of car spaces without the use of surfacing marking which is often not possible in the loose surfaces used in rural locations.

#### NOTES

All softwood to be pressure impregnated to BS 1282 (1975)

All galv. steel to BS 729 (1986)

Refer to: 1.1.1 Car Parks: Design guidelines / 1.8 Access for all

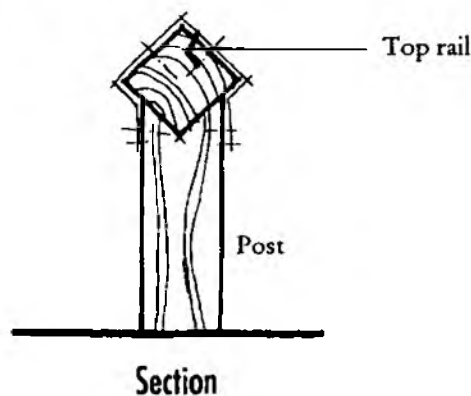
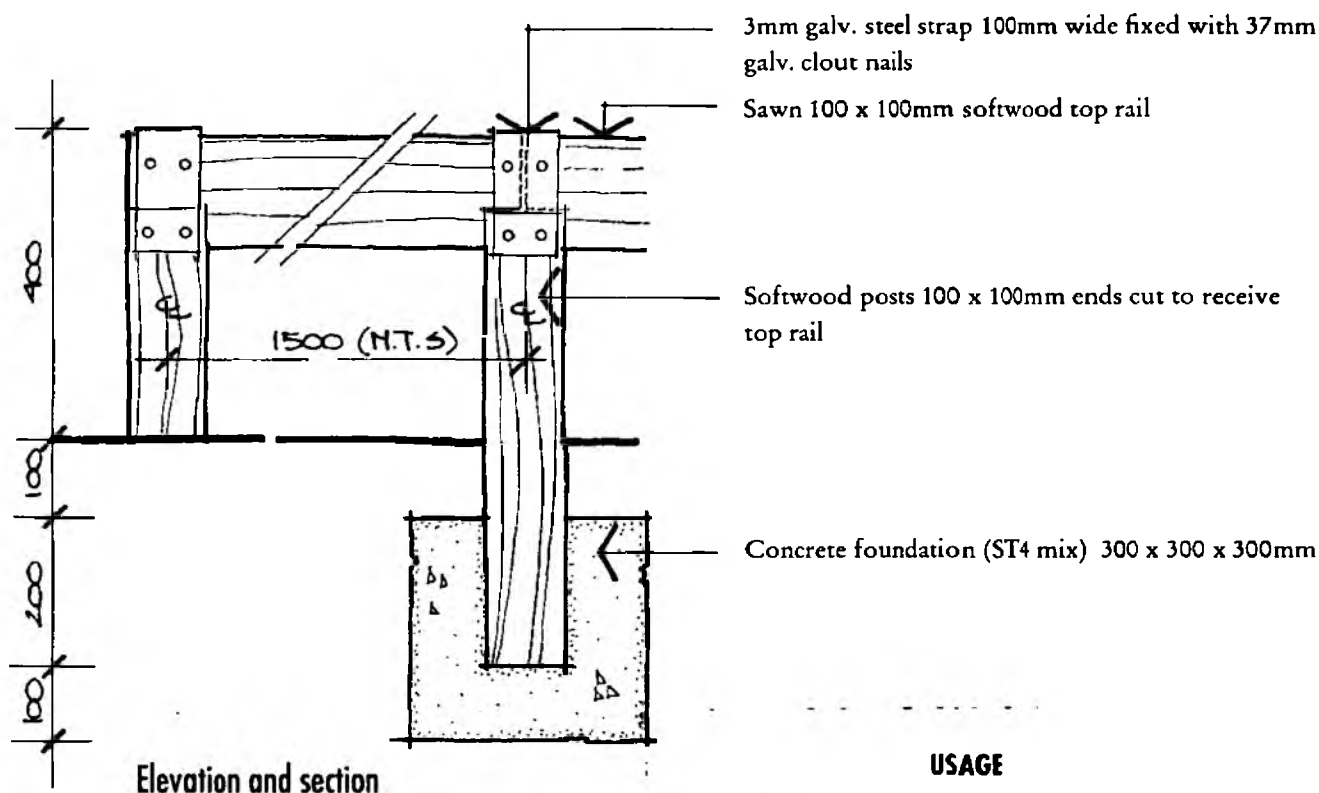
Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
+	+	•	•	•	•	R/S
Low + Medium • High -	Good + Medium • Poor -	Good + Medium • Poor -	Low + Medium • High -	Good + Medium • Poor -	Good + Medium • Poor -	Rural R Semi-rural S Urban U

## 2.6 STRUCTURES: BARRIERS AND HEIGHT RESTRICTORS

### 2.6.2 TIMBER KNEE RAIL

SCALE 1:10

1 OF 1



#### USAGE

A simple trip-rail detail which is relatively inconspicuous but will protect grass or planted areas from both pedestrians and cars

#### NOTES

All Softwood pressure impregnated to BS 1282 (1975)

All Steel fixing and fixtures galv. steel to BS 729 (1986)

In urban areas where regular grass cutting takes place a hard mowing strip (brick or concrete block) will avoid hand trimming

Source: LUC

Refer to: 1.1.1 Car Parks: Design guidelines / 1.8 Access for all

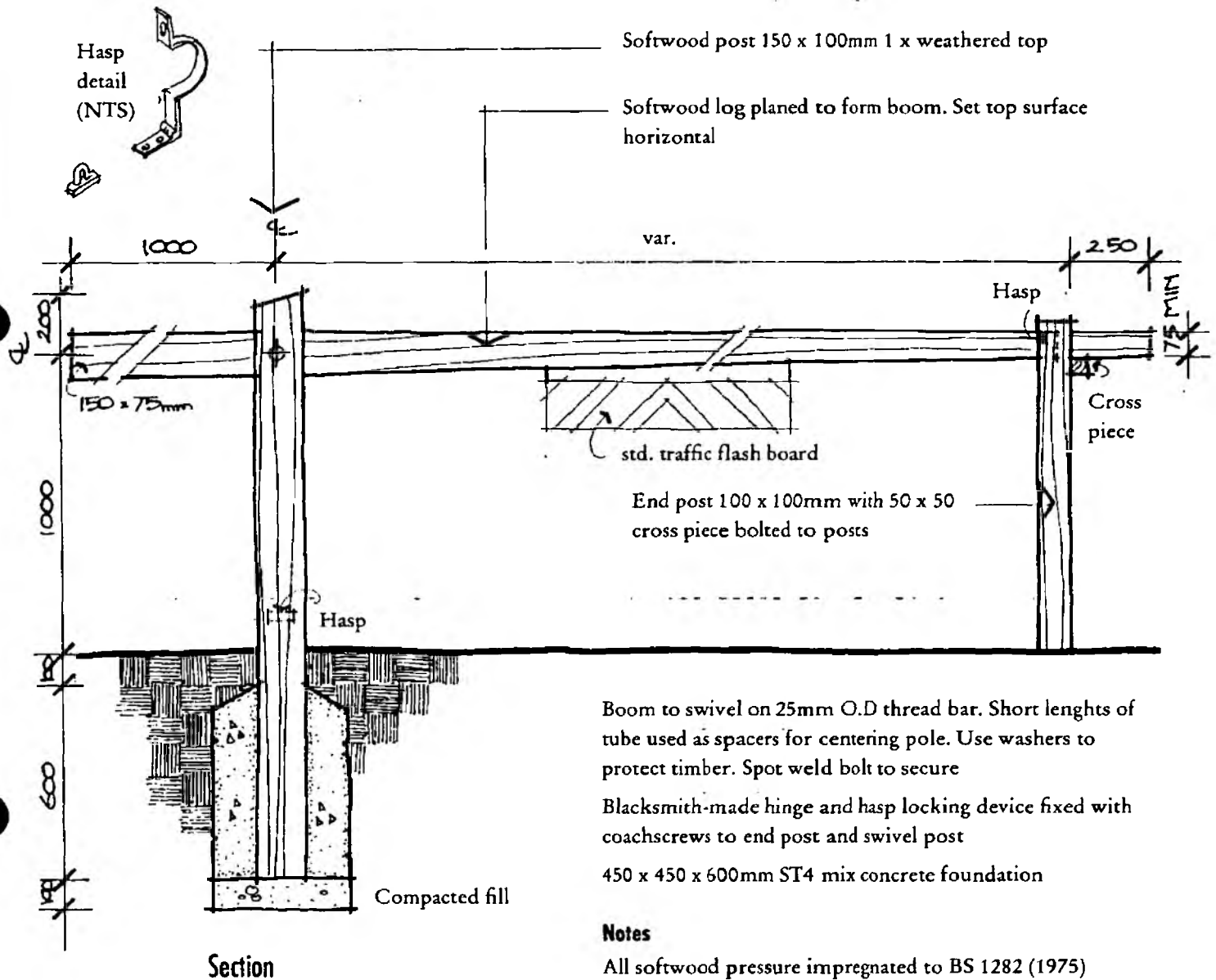
Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
+	+	+	+	+		<b>R/S/U</b>
Low + Medium • High -	Good + Medium • Poor -	Good + Medium • Poor -	Low + Medium • High -	Good + Medium • Poor -	Good + Medium • Poor -	Rural R Semi-rural S Urban U

## 2.6 STRUCTURES: BARRIERS AND HEIGHT RESTRICTORS

### 2.6.3 VERTICAL TIMBER POLE BARRIER

**SCALE 1:20**

1 OF 1



Source: LUC

Boom to swivel on 25mm O.D thread bar. Short lengths of tube used as spacers for centering pole. Use washers to protect timber. Spot weld bolt to secure

Blacksmith-made hinge and hasp locking device fixed with coachscrews to end post and swivel post

450 x 450 x 600mm ST4 mix concrete foundation

## Notes

**All softwood pressure impregnated to BS 1282 (1975)**

**All steel fixings and fixtures galv. steel to BS 729 (1986)**

## Usage

### Basic vehicle barrier for rural and semi-rural locations

**Refer to: 1.1.1 Car Parks: Design guidelines / 1.8 Accesss for all**

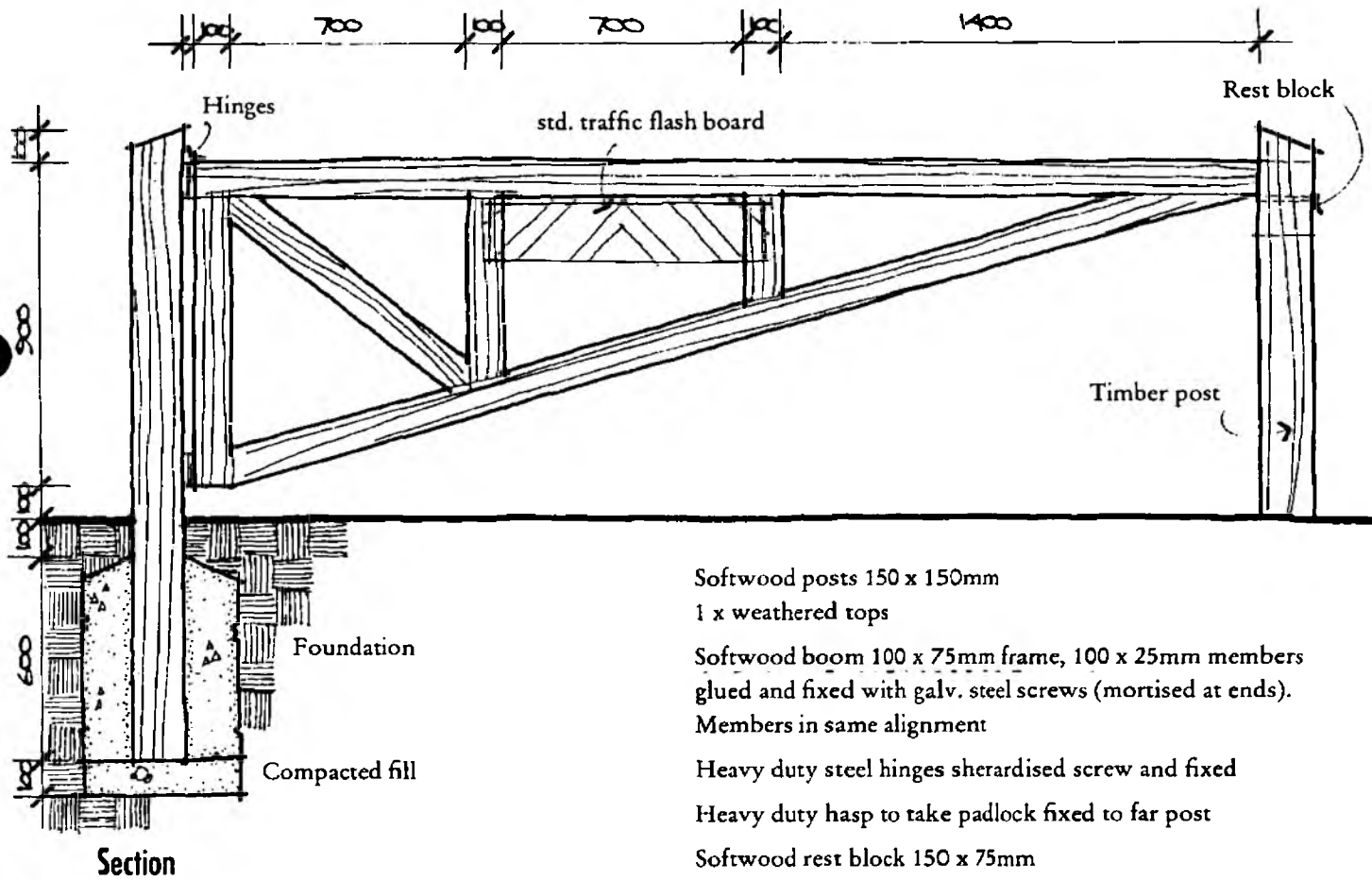
Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
+	+	+	+	+		<b>R/S</b>
Low +	Good +	Good +	Low +	Good +	Good +	Rural R
Medium •	Medium •	Medium •	Medium •	Medium •	Medium •	Semirural S
High -	Poor -	Poor -	High -	Poor -	Poor -	Urban U



2.6 STRUCTURES: BARRIERS AND HEIGHT RESTRICTORS

2.6.4 HORIZONTAL TIMBER POLE BARRIER

SCALE 1:20 1 OF 1



Usage

Basic vehicle barrier for rural and semi-rural locations

Notes

All softwood pressure impregnated to BS 1282 (1975)

All steel fixing and fixtures galv. steel to BS 729 (1986)

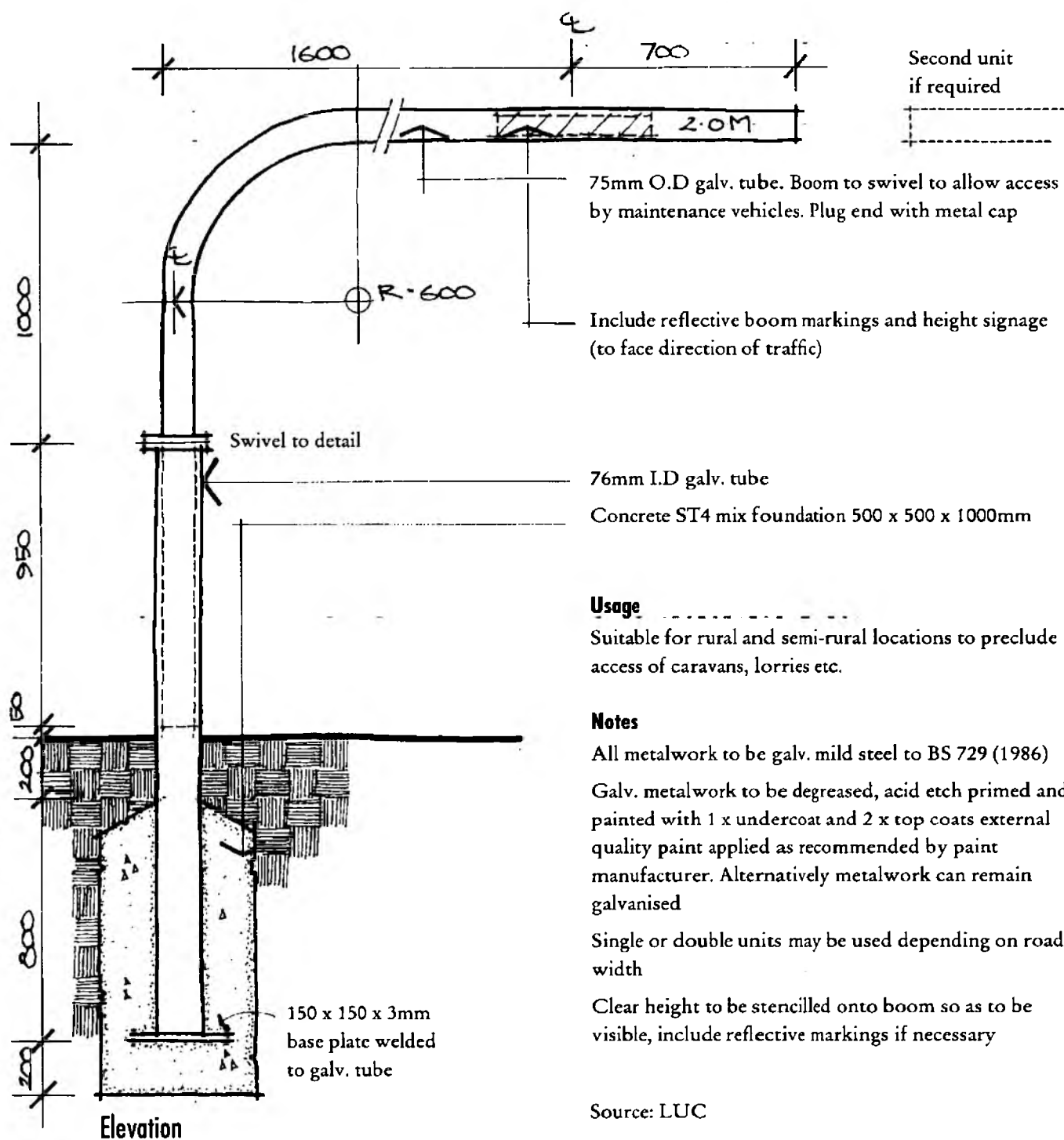
Refer to: 1.1.1 Car Parks: Design guidelines / 1.8 Access for all

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
+	+	+	+	+		R/S
Low + Medium • High -	Good + Medium • Poor -	Good + Medium • Poor -	Low + Medium • High -	Good + Medium • Poor -	Good + Medium • Poor -	Rural R Semi-rural S Urban U

## 2.6 STRUCTURES: BARRIERS AND HEIGHT RESTRICTORS

### 2.6.5 METAL HEIGHT RESTRICTORS

SCALE 1:20      1 OF 2



## Usage

Suitable for rural and semi-rural locations to preclude access of caravans, lorries etc.

## Notes

**All metalwork to be galv. mild steel to BS 729 (1986)**

Galv. metalwork to be degreased, acid etch primed and painted with 1 x undercoat and 2 x top coats external quality paint applied as recommended by paint manufacturer. Alternatively metalwork can remain galvanised

Single or double units may be used depending on road width

Clear height to be stencilled onto boom so as to be visible, include reflective markings if necessary

Source: LUC

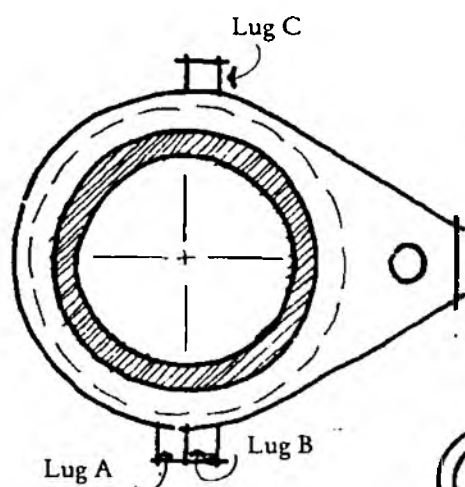
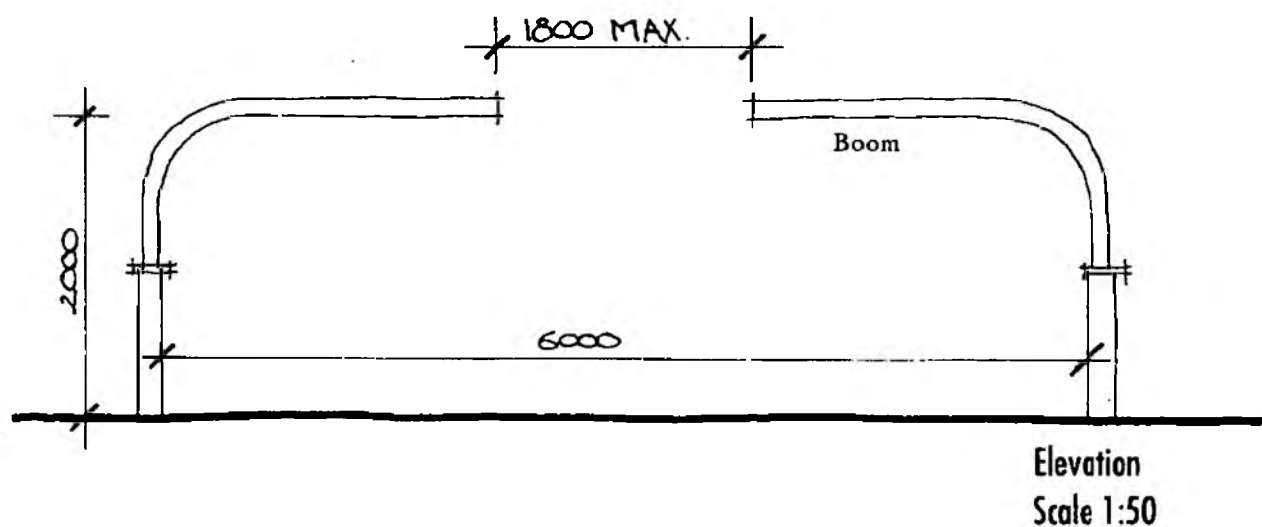
Refer to: **1.1.1 Car Parks: Design guidelines / 1.8 Accesss for all**

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
●	●	+	+	●		<b>R/S/U</b>
Low + Medium ● High -	Good + Medium ● Poor -	Good + Medium ● Poor -	Low + Medium ● High -	Good + Medium ● Poor -	Good + Medium ● Poor -	Rural <b>R</b> Semi-rural <b>S</b> Urban <b>U</b>

## 2.6 STRUCTURES: BARRIERS AND HEIGHT RESTRICTORS

### 2.6.5 METAL HEIGHT RESTRICTORS

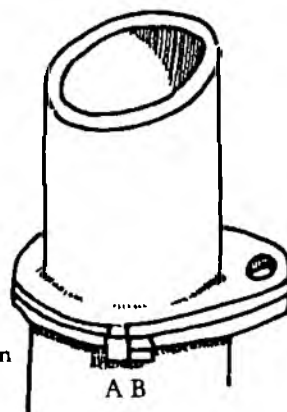
2 OF 2



Cross section  
Scale 1:2

Swivel detail

To open



#### Notes

Lug A (welded to upper flange) to stop against lug B (welded to lower flange) to prevent boom opening other than into site. When in the open position lug C. Prevents a swing of more than 180°

In siting sufficient space should be allowed for caravans etc, to turn around before boom

More substantial variant may be needed where potential for trespass is great

To take padlock

Lug B not to protrude above face of lower flange

Source: LUC

Refer to: 1.1.1 Car Parks: Design guidelines / 1.8 Access for all

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
• Low + Medium • High -	• Good + Medium • Poor -	+ Good + Medium • Poor -	+ Low + Medium • High -	• Good + Medium • Poor -	Good + Medium • Poor -	<b>R/S/U</b>  Rural R Semi-rural S Urban U

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## PART B

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### 3.0 FURNITURE

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## 3.1 FURNITURE: SEATING

### 3.1.1 SEATING: DESIGN GUIDELINES

1 OF 1

There is an almost bewildering choice of proprietary seating available. The following sheets contain a selection considered most likely to be appropriate for the NRA's needs.

#### Selection

Two objectives should be considered:

1. Providing for physical needs
2. Impact on perceived image of the site

The first is easily achieved. The second presents a more complex challenge. In most cases the aim will be to minimise the visual impact of the seat(s) in which case the choice should be heavily influenced by its context. Material and style are critical with urban sites generally favouring more stylised, possibly steel or mixed media seats and rural areas simple timber benches. (Note the 'Context' box on each sheet)

There can however be instances in which well designed seats can make a dramatic and positive impact. Stylised, probably simple, possibly specially designed pieces can effectively and economically raise perceptions of a site, particularly if the same level of design is applied to signage. The seats' message must be consistent with that being projected by the site as a whole. Design advice is best sought from a Landscape Architect.

#### Bench or seat?:

(A seat has a back, a bench none)

Considerations should be:  
type of likely use/abuse;  
character of local surroundings;  
visual impact;  
cost.

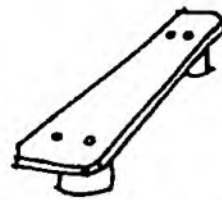
Benches usually project a more informal image (except stylised steel varieties); they are more robust and are cheaper.

Seats project urban (sometimes suburban) images and are better for access for all purposes, particularly if fitted with arms.

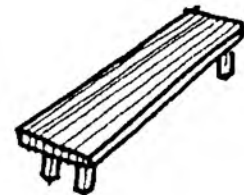
The best height for a seat is 400–500mm off the ground, this allows the most comfortable seating position.

#### Position:

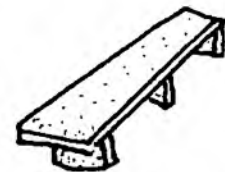
It is easily forgotten that seats should be placed in interesting and accessible positions. A view point is an obvious choice, but a seat positioned at the top of major steps or a ramp will always receive use. Seating should also be set away from the main pedestrian flow, perhaps with some seats in full sun and others in semi-shade.



Simple timber benches

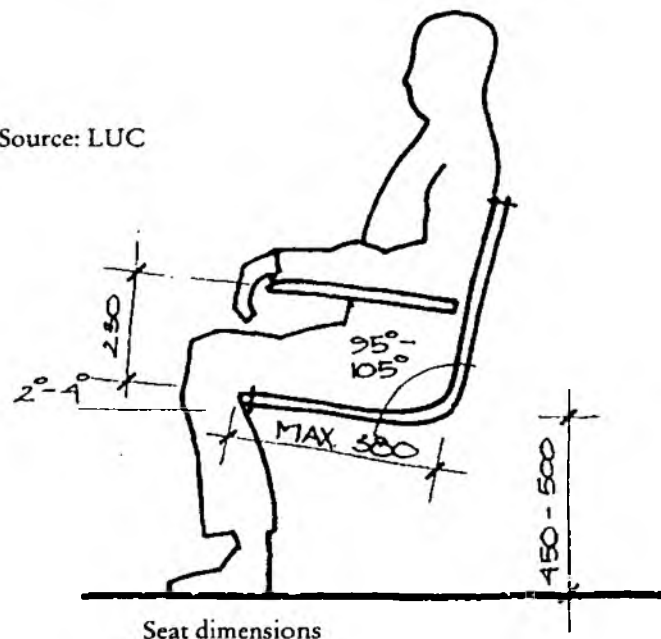


Avoid false rusticity



Simple stone bench

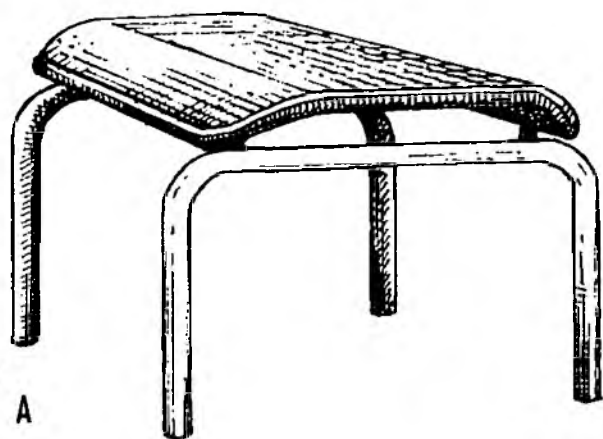
Source: LUC



## 3.1 FURNITURE: SEATING

### 3.1.2 BENCHES – METAL MESH

1 OF 1



A

#### SPECIFICATIONS

Finish: Polyester powder coated in various colours by the manufacturer

Fixing: surface/below ground

#### USAGE

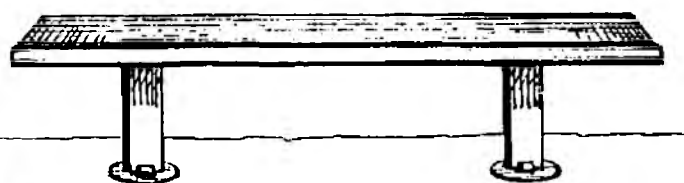
Suitable for urban sites

Preferable colours include black, dark red and dark blue

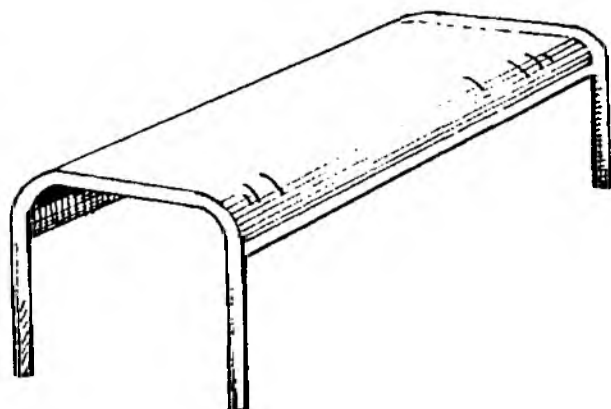
Benches not ideal for elderly and disabled

#### NOTES

Damaged paintwork can be repainted with external quality metalwork paint of matching colour



B



C

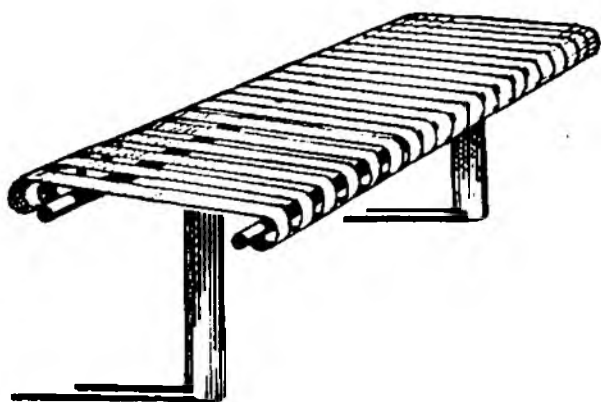
Refer to: 1.8 Access for all / 3.1.6 Seats: Metal mesh / Part C 1.0 Suppliers

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
● Low + Medium ● High –	● Good + Medium ● Poor –	+ Good + Medium ● Poor –	● Low + Medium ● High –	● Good + Medium ● Poor –	● Good + Medium ● Poor –	<b>U</b> Rural R Semi rural S Urban U

## 3.1 FURNITURE: SEATING

### 3.1.3 BENCHES – METAL SLATS

1 OF 1



#### SPECIFICATIONS

Finish: polyester powder coated in various colours by the manufacturer

Fixing: surface/below ground

#### USAGE

Suitable for urban sites

Preferable colours include, black, dark red, and dark blue

Benches not ideal for elderly and disabled

#### NOTES

Damaged paintwork can be repainted with external quality metalwork paint of matching colour

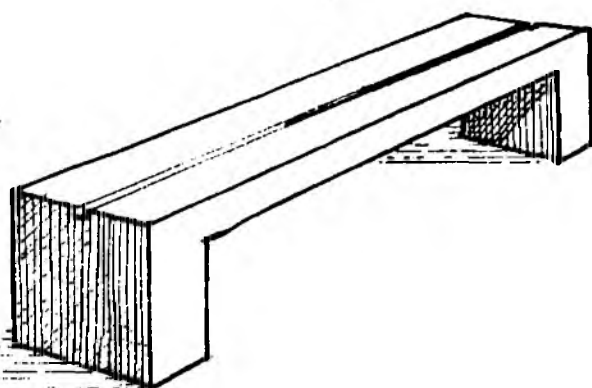
Refer to: 1.8 Access for all / 3.1.7 Seats: Metal slats / Part C 1.0 Suppliers

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
● Low + Medium ● High –	● Good + Medium ● Poor –	● Good + Medium ● Poor –	● Low + Medium ● High –	● Good + Medium ● Poor –	● Good + Medium ● Poor –	<b>U</b> Rural R Semi rural S Urban U

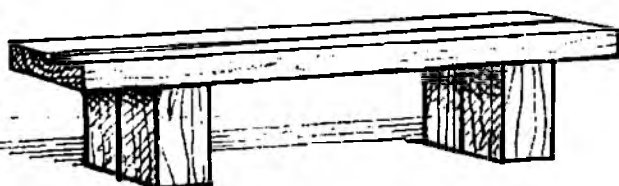
## 3.1 FURNITURE: SEATING

### 3.1.4 BENCHES – TIMBER

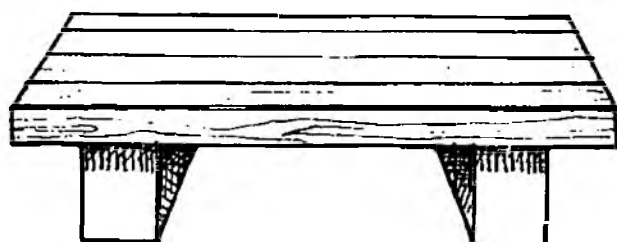
1 OF 1



A



B



C

#### SPECIFICATIONS

Length: various

Materials: hardwood or softwood

Finish: natural timber finish or as alternative dark timber stains

Fixing: below ground

#### USAGE

Suitable for rural or semi-rural sites

Black stained timber suitable for more urban sites

Benches are not ideal for the elderly or disabled

#### NOTES

Choice of timber for benches will affect durability and costs

Ensure that materials meet the requirements of the NRA's Environmental Policy

Refer to: 1.8 Access for all / 3.1.11 Picnic tables: Timber / Part C 1.0 Suppliers

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
●	●	+	+	+	●	<b>R/S</b>
Low + Medium ● High –	Good + Medium ● Poor –	Good + Medium ● Poor –	Low + Medium ● High –	Good + Medium ● Poor –	Good + Medium ● Poor –	Rural R Semi rural S Urban U



## 3.1 FURNITURE: SEATING

### 3.1.5 BENCHES – MIXED MEDIA

1 OF 1

#### SPECIFICATIONS

Length: various

Materials: softwood and tropical/homegrown hardwood with metal legs, metal bench with concrete legs

Finish:

Timber: natural finish

Metal : polyester powder coated in various colours by manufacturer

Concrete: fine aggregate

Mix to manufacturer's standard colours, Buff or Aberdeen (Tan Buff)

Fixing: below ground or free standing

#### USAGE

Suitable for urban and semi-rural sites

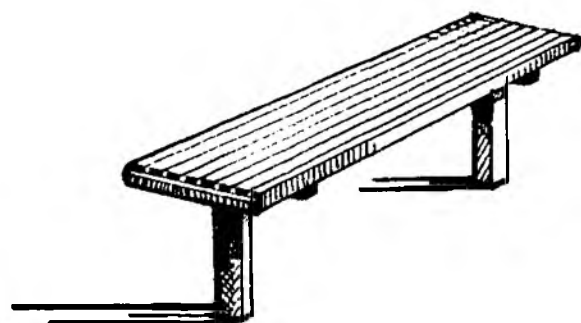
Preferable colour for paintwork is black

Benches are not ideal for the elderly or disabled

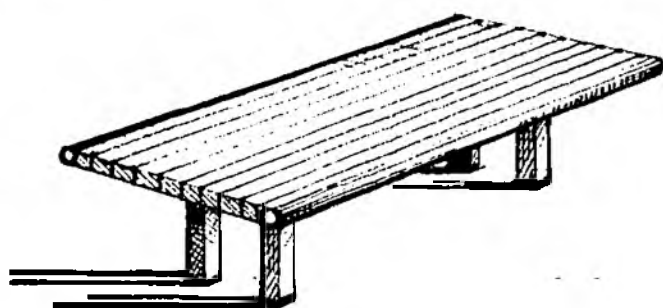
#### NOTES

Damaged paintwork can be repainted with external quality metalwork paint of matching colour

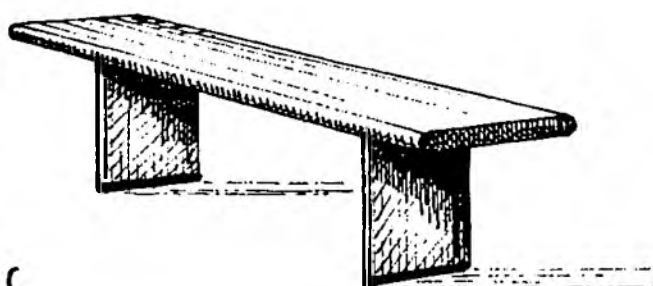
Ensure that timber meets the requirements of the NRA's Environmental Policy



A



B



C

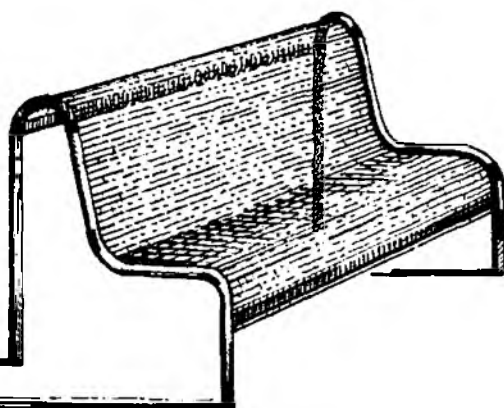
Refer to: 1.8 Access for all / 3.1.9 Seats: Mixed media / Part C 1.0 Suppliers

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
●	●	+	●	●	●	<b>S/U</b>
Low + Medium ● High –	Good + Medium ● Poor –	Good + Medium ● Poor –	Low + Medium ● High –	Good + Medium ● Poor –	Good + Medium ● Poor –	Rural R Semi rural S Urban U

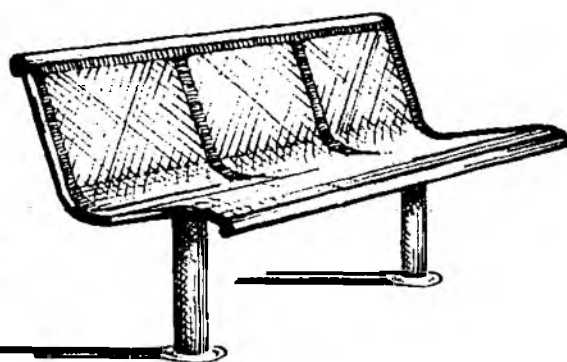
## 3.1 FURNITURE: SEATING

### 3.1.6 SEATS – METAL MESH

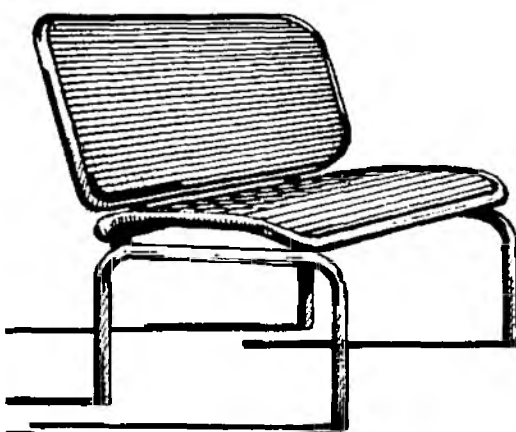
1 OF 1



A



B



C

#### SPECIFICATIONS

Length: various

Finish: polyester powder coated in various colours by manufacturer

Fixing: surface/below ground

Armrest can be supplied on some

#### USAGE

Suitable for urban sites

Preferable colours for metalwork include black, dark red and dark blue

Armrest preferable for use by elderly and disabled

#### NOTES

Damaged paintwork can be repainted with external quality metalwork paint of matching colour

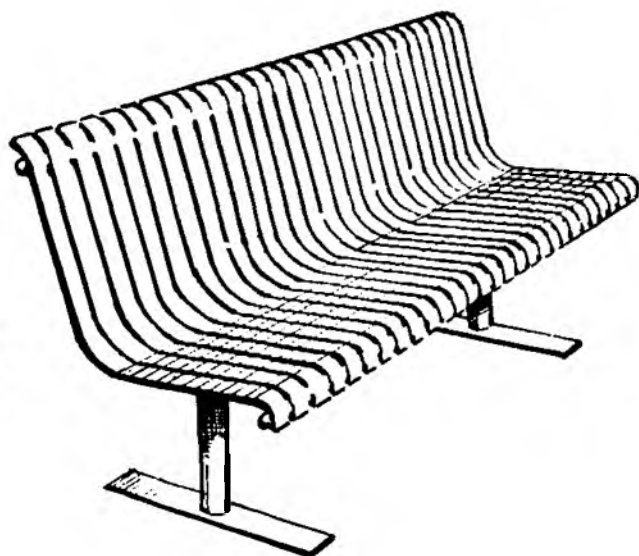
Refer to: 1.8 Access for all / 3.1.2 Benches: Metal mesh / Part C 1.0 Suppliers

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
●	●	+	●	●	+	<b>U</b>
Low + Medium ● High –	Good + Medium ● Poor –	Good + Medium ● Poor –	Low + Medium ● High –	Good + Medium ● Poor –	Good + Medium ● Poor –	Rural R Semi rural S Urban U

## 3.1 FURNITURE: SEATING

### 3.1.7 SEATS – METAL SLATS

1 OF 1



#### SPECIFICATIONS

Finish: polyester powder coated in various colours by manufacturer

Fixing: surface/below ground

Armrests optional

#### USAGE

Suitable for urban sites

Preferable colours for metalwork include black, dark red and dark blue

Armrests are preferable for use by elderly and disabled

#### NOTES

Damaged paintwork can be repainted with external quality metalwork paint of matching colour

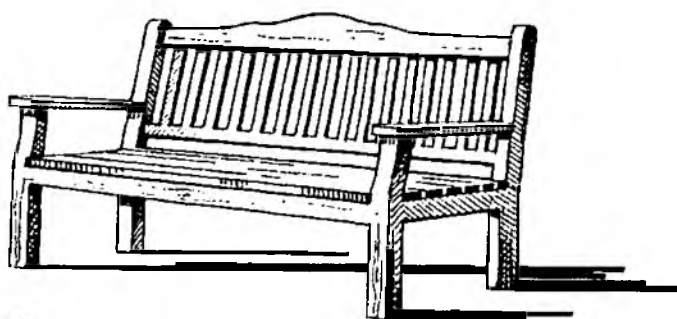
Refer to: 1.8 Access for all / 3.1.3 Benches: Metal slats / Part C 1.0 Suppliers

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
● Low + Medium ● High –	● Good + Medium ● Poor –	+ Good + Medium ● Poor –	● Low + Medium ● High –	● Good + Medium ● Poor –	+ Good + Medium ● Poor –	U Rural R Semi rural S Urban U

## 3.1 FURNITURE: SEATING

### 3.1.8 TRADITIONAL TIMBER SEATING

1 OF 1



A

#### SPECIFICATIONS

Length: between 1500mm–2400mm

Material: hardwood

Finish: natural timber finish

Fixing: no permanent fixing bracket option is available

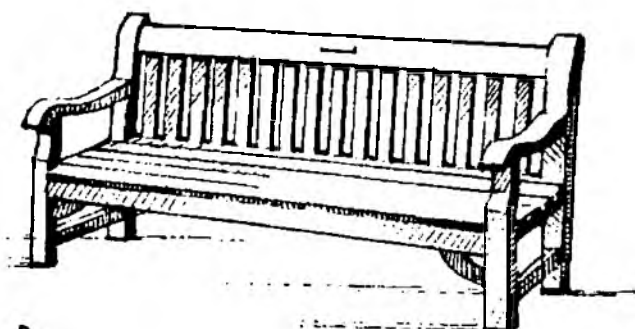
#### USAGE

Suitable for urban and semi-rural sites

#### NOTES

Choice of timber will affect durability and costs

Ensure that timber meets the requirements of the NRA's Environmental Policy



B

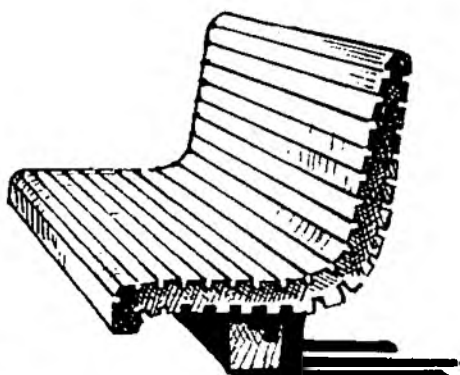
Refer to: 1.8 Access for all / Part C 1.0 Suppliers

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
–	+	+	+	●	+	<b>S/U</b>
Low + Medium ● High –	Good + Medium ● Poor –	Good + Medium ● Poor –	Low + Medium ● High –	Good + Medium ● Poor –	Good + Medium ● Poor –	Rural R Semi rural S Urban U

## 3.1 FURNITURE: SEATING

### 3.1.9 SEATS – MIXED MEDIA

1 OF 1



#### SPECIFICATIONS

Materials: tropical hardwood or softwood

Finish: natural timber finish

Metal: polyester powder coated in various colours by manufacturer

Fixing: surface/below ground

Armrest optional for all benches (metal)

#### USAGE

Suitable for urban or semi-rural sites

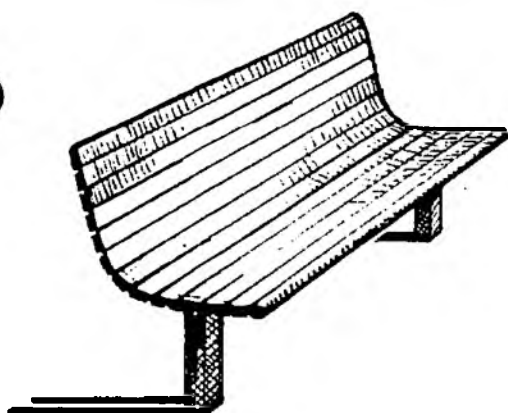
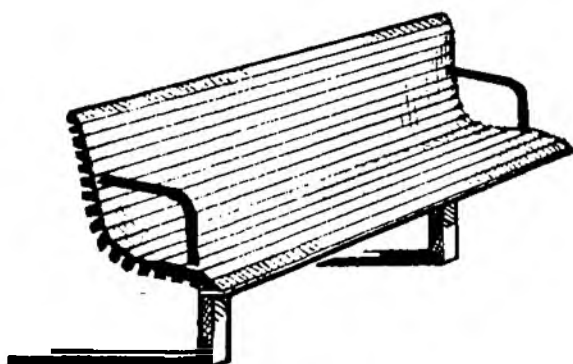
Preferable colour for metalwork is black

Armrests preferable for use by elderly and disabled

#### NOTES

Damaged paintwork can be repainted with external quality metalwork paint of matching colour

Ensure that timber meets the requirements of the NRA's Environmental Policy



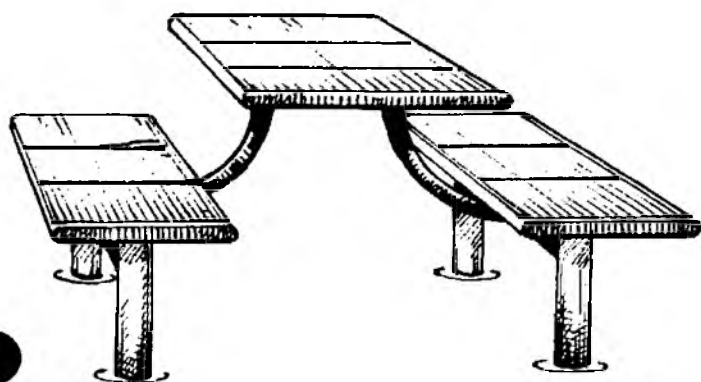
Refer to: 1.8 Access for all / 3.1.5 Benches: Mixed media / Part C 1.0 Suppliers

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
●	●	+	●	●	+	S/U
Low + Medium ● High –	Good + Medium ● Poor –	Good + Medium ● Poor –	Low + Medium ● High –	Good + Medium ● Poor –	Good + Medium ● Poor –	Rural R Semi rural S Urban U

## 3.1 FURNITURE: SEATING

### 3.1.10 PICNIC TABLES – METAL MESH

1 OF 1



#### SPECIFICATIONS

Length: various

Finish: polyester powder coated in various colours by manufacturer

Fixing: surface/below ground

#### USAGE

Suitable for urban sites

Preferable colours include black, dark red and dark blue

#### NOTES

Damaged paintwork can be repainted with external quality metalwork paint of matching colour

When supplying picnic tables ensure that some can be used by disabled people, particularly those in wheelchairs. The position of table legs and other support structures and clear vertical height under the table top should allow a wheelchair to fit under one or both ends of the table or to one side by shortening the bench seat (see 3.1.11).

See 1.8.1. for details of dimensions

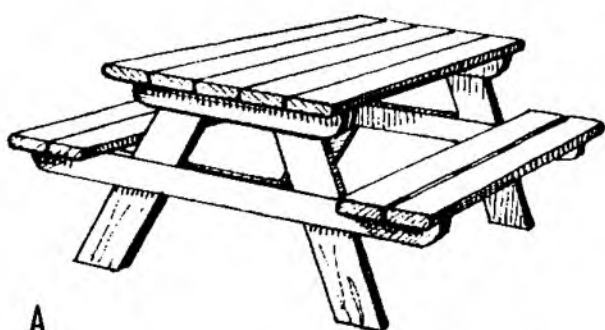
Refer to: **1.8 Access for all / 3.1.2 – 3.1.6 Benches/Seats: Metal mesh / Part C 1.0 Suppliers**

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
●	●	+	●	●	+	<b>U</b>
Low + Medium ● High –	Good + Medium ● Poor –	Good + Medium ● Poor –	Low + Medium ● High –	Good + Medium ● Poor –	Good + Medium ● Poor –	Rural <b>R</b> Semi rural <b>S</b> Urban <b>U</b>

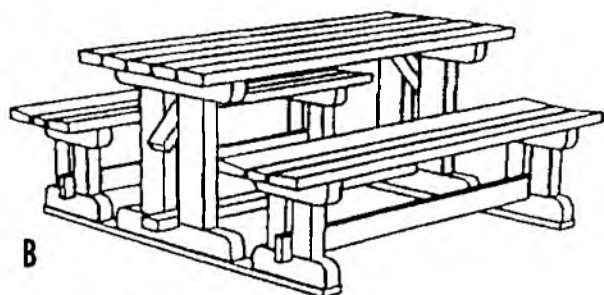
## 3.1 FURNITURE: SEATING

### 3.1.11 PICNIC TABLES – TIMBER

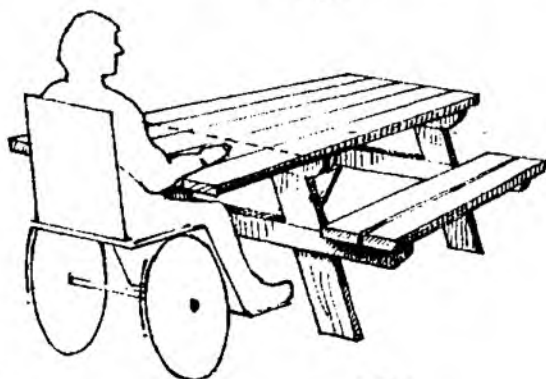
1 OF 1



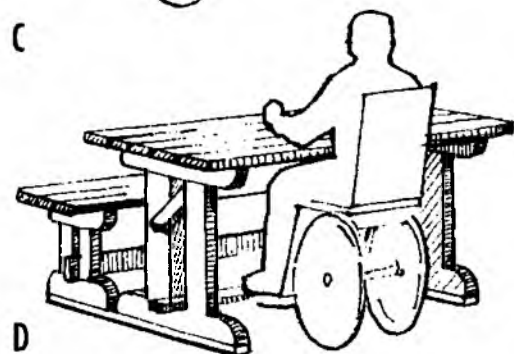
A



B



C



D

#### SPECIFICATIONS

Length: various

Material: softwood or tropical hardwood

Fixing: free-standing but will require site leveling

#### OPTIONS

C/D. Larger table overhang allows for disabled wheelchair access. See 1.8.1.

B. Benches may be free-standing or provided with backrest

#### USAGE

Suitable for rural sites

#### NOTES

May require bolting down to a concrete footing

Ensure timber meets requirements of NRA's Environmental Policy. Make sure that some of the tables can be used by wheelchair users

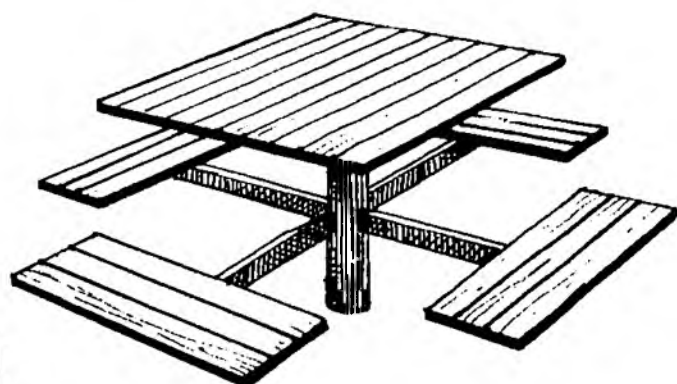
Refer to: 1.8 Access for all / 3.1.4 Benches: Timber / Part C 1.0 Suppliers

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
•	•	+	+	+	–	<b>R/S</b>
Low + Medium • High –	Good + Medium • Poor –	Good + Medium • Poor –	Low + Medium • High –	Good + Medium • Poor –	Good + Medium • Poor –	Rural R Semi rural S Urban U

## 3.1 FURNITURE: SEATING

### 3.1.12 PICNIC TABLES – MIXED MEDIA

1 OF 1



#### Material:

Timber: tropical hardwood or softwood

Metalwork: tubular steel

#### Finish:

Timber: natural finish

Metalwork: polyester powder coated on various colours by manufacturer

Fixing: below ground/base plate to manufacturer's detail

Options: seat backs (preferable for elderly and disabled)

#### USAGE

Suitable for semi-rural sites

Preferable colours for metalwork include bronze and black

#### NOTES

Choice of timber will affect durability and costs

Ensure that timber meets the requirements of the NRA's Environmental Policy

When supplying picnic tables make sure that some can be used by disabled people, particularly those in wheelchairs.

See 1.8.1.

Refer to: 1.8 Access for all / 3.1.5 – 3.1.9 Benches/Seats: Mixed media / Part C 1.0 Suppliers

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
●	●	+	●	●	—	<b>S</b>
Low + Medium ● High —	Good + Medium ● Poor —	Good + Medium ● Poor —	Low + Medium ● High —	Good + Medium ● Poor —	Good + Medium ● Poor —	Rural R Semi rural S Urban U

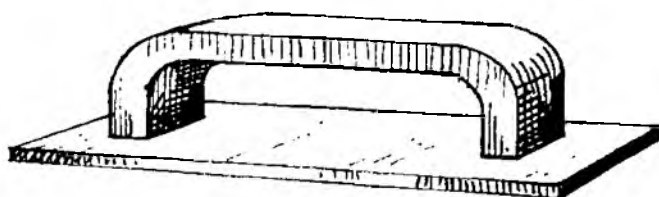


## 3.1 FURNITURE: SEATING

### 3.1.13 COMMISSIONED SEATING

1 OF 1

Paul De Monchaux



On certain occasions and for specific sites it may be appropriate to commission a special seat or bench. This may be, for example, to celebrate the opening of a new site. The illustrations show two examples of previously commissioned seating.

The advantage of this type of seating is that it is specifically designed for each site and will therefore be unique and appropriate to its surroundings. Such seats are designed and built by craftsmen which mean that the standard of workmanship and quality of materials are usually superior to 'off the peg' designs. The disadvantages are that costs are often higher and include time needed for close liaison with the artist.

Advice and help on commissioning seats and other artwork is available from the arts bodies listed below. They may also be able to provide illustrations showing examples of different artists' work.

The Crafts Council can also provide information on public art agencies who provide a service liaising between client and artist for commissioned work.

#### Arts Council of Great Britain

14 Great Peter Street  
London SW1P 3NQ  
Tel: 071 333 0100

#### Welsh Arts Council

Museum Place  
Cardiff CF1 3NX  
Tel: 0222 394711

#### The Crafts Council

44a Pentonville Road  
London N1 9BY  
Tel: 071 278 7700

#### Eastern Arts

Cherry Hinton Hall  
Cherry Hinton Road  
Cambridge CB1 4DW  
Tel: 0223 215355

#### East Midlands Arts

Mountfields House  
Forest Road  
Loughborough  
Leics LE11 3HU  
Tel: 0509 218292

#### London Arts Board

Elme House  
133 Long Acre  
London WC2E 9AS  
Tel: 071 240 1313

#### North Wales Arts

10 Wellfield House  
Bangor  
Gwynedd LL57 1ER  
Tel: 0248 353248

#### Northern Arts

12 Harter Street  
Manchester M1 6HY  
Tel: 061 228 3062

#### South East Arts

10 Mount Ephraim  
Tunbridge Wells  
Kent TN4 8AS  
Tel: 0892 515210

#### South East Wales Art

Victoria Street  
Cwmbran  
Gwent NP44 3YT  
Tel: 0633 875075

#### South West Arts

Bradinch Place  
Gandy Street  
Exeter EX4 3LS  
Tel: 0392 218188

#### Southern Arts

13 St. Clement Street  
Winchester  
Hants SO23 9DQ  
Tel: 0962 855099

#### West Midlands Art

82 Granville Street  
Birmingham B1 2LH  
Tel: 021 631 3121

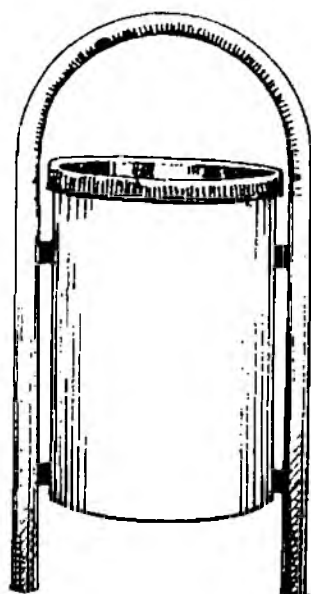
#### West Wales Art

Dark Gate  
3 Red Street  
Carmarthen  
Dyfed SA31 1QL  
Tel: 0267 234248

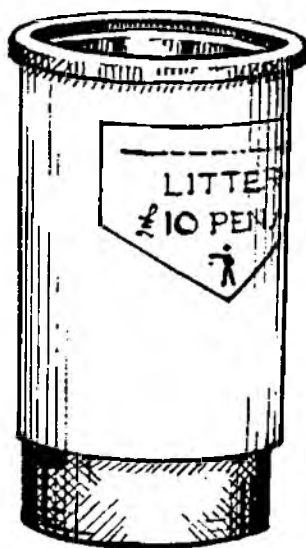
## 3.2 FURNITURE: LITTER BINS

### 3.2.1 PROPRIETARY METAL LITTER BINS

1 OF 1



A



B

#### SPECIFICATIONS

Height: Generally less than 1 metre

Capacity: 76 litres approx

Finish: polyester powder coated in a variety of colours by manufacturer

Rim can be specified in a different colour

Liner: galv. aluminium accessed by lockable door

Fixing:

Surface below ground, surface/free-standing, with concrete ballast inside base

Can also be D – sections shaped and wall mounted

#### USAGE

Suitable for urban settings

#### NOTES

1. Liners need replacing every 7–10 years depending on wear
2. Damaged paintwork can be repainted with external quality metalwork paint of matching colour
3. Litterbins to be installed on site only where there is a refuse collection scheme in operation

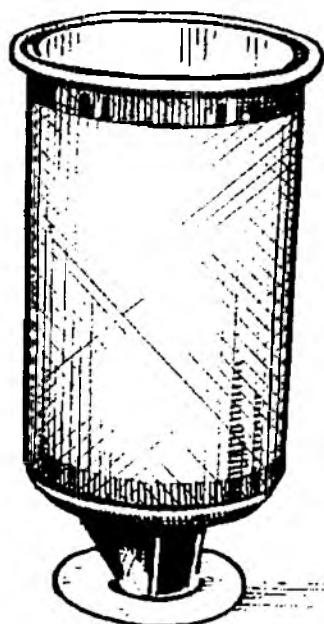
Refer to: **Part C 1.0 Suppliers**

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
●	●	+	●	●		<b>U</b>
Low + Medium ● High –	Good + Medium ● Poor –	Good + Medium ● Poor –	Low + Medium ● High –	Good + Medium ● Poor –	Good + Medium ● Poor –	Rural <b>R</b> Semi rural <b>S</b> – Urban <b>U</b>

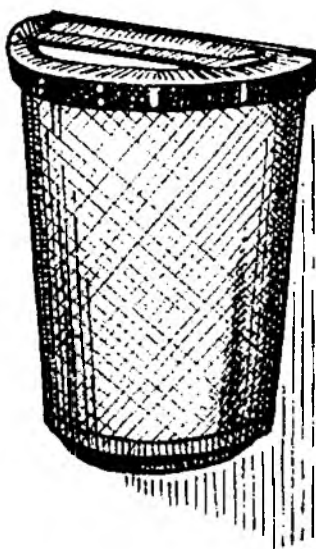
## 3.2 FURNITURE: LITTER BINS

### 3.2.2 PROPRIETARY METAL MESH LITTER BINS

1 OF 1



A



B

#### SPECIFICATIONS

Height: less than 1 metre

Capacity: varies

Finish: A/B polyester powder coated in various colours by manufacturer. Contrast colour to rim available

Liner: A/B lockable light grey coloured sheet metal

Fixing: surface/below ground

Optional lid to A stainless steel available allowing 180mm diameter aperture

#### USAGE

Suitable for urban sites

#### NOTES

Damaged paintwork can be repainted with external quality metalwork paint of matching colour

Style should ideally be coordinated with other street furniture elements

Litterbins to be installed on site only where there is a refuse collection scheme in operation

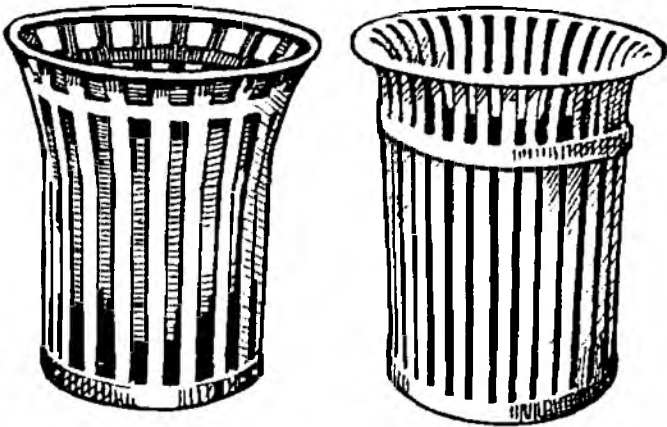
Refer to: 3.1.2 / 3.1.6 / 3.1.10 Benches/Seats/Picnic tables: Metal mesh / Part C 1.0 Suppliers

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
•	•	+	•	•		<b>U</b>
Low + Medium • High –	Good + Medium • Poor –	Good + Medium • Poor –	Low + Medium • High –	Good + Medium • Poor –	Good + Medium • Poor –	Rural R Semi rural S Urban U

3.2 FURNITURE: LITTER BINS

3.2.3 PROPRIETARY METAL SLAT LITTER BINS

1 OF 1



SPECIFICATIONS

- Height: less than 1 metre
- Capacity: 100+ litres
- Finish: polyester powder coated by manufacturer in various colours
- Liner: lockable plastic or galv. steel inner bin
- Fixing: below ground
- Optional self closing doors to existing low profile domed lid

USAGE

Suitable for urban settings

NOTES

- 1. Steel liner is preferable to plastic
- 2. Damaged paintwork can be repainted with external quality metalwork paint of matching colour
- 3. Litterbins to be installed on site only where there is a refuse collection scheme in operation

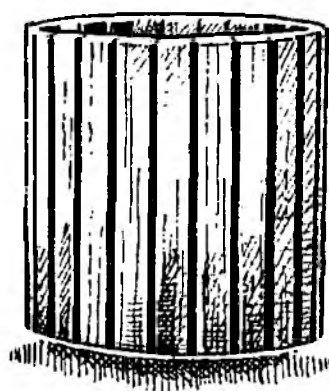
Refer to: 3.1.3 / 3.1.7 Benches/Seats: Metal slats / Part C 1.0 Suppliers

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
●  Low + Medium ● High -	●  Good + Medium ● Poor -	●  +  Good + Medium ● Poor -	●  Low + Medium ● High -	●  Good + Medium ● Poor -	●  Good + Medium ● Poor -	U  Rural R Semi rural S Urban U

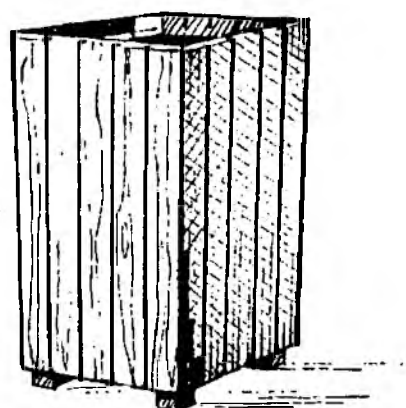
## 3.2 FURNITURE: LITTER BINS

### 3.2.4 PROPRIETARY TIMBER LITTER BINS

1 OF 1



A



B

#### SPECIFICATIONS

Height:

A: 610/910mm (58/65mm diameter)

B: 700/910 mm

Capacity:

A: 109/145 litres

B: 145/175 litres

Finish:

tropical hardwood

Liner:

A/B: galv. steel bin (not lockable)

B: metal mesh bin with optional locking device

Lid:

A: tapered lid, powder coated mild steel, formed to reduce aperture diameter. (Option A doomed-top lid with self-closing door) All available in 6 standard colours

B: Optional mild steel lid (do not use fibreglass lid)

Fixing:

A/B: surface/below ground

B: surface

#### USAGE

Suitable for rural and semi-rural locations

Preferable colours for lids include black, bronze and dark green

The use of lids is preferable

Litterbins to be installed on site only where there is a refuse collection in operation

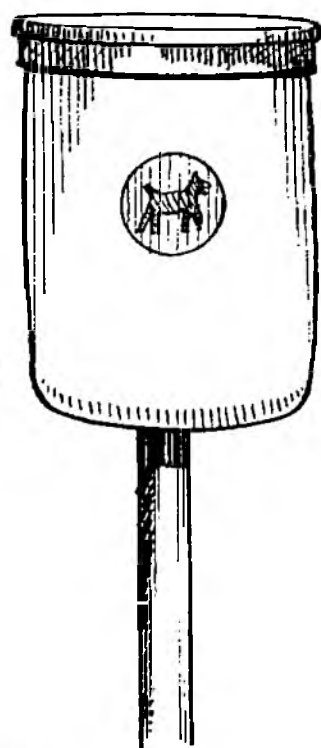
Refer to: **3.1.4 / 3.1.11 Benches/Picnic tables: Timber / Part C 1.0 Suppliers**

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
●	●	+	●	+		<b>R/S</b>
Low + Medium ● High –	Good + Medium ● Poor –	Good + Medium ● Poor –	Low + Medium ● High –	Good + Medium ● Poor –	Good + Medium ● Poor –	Rural R Semi rural S Urban U

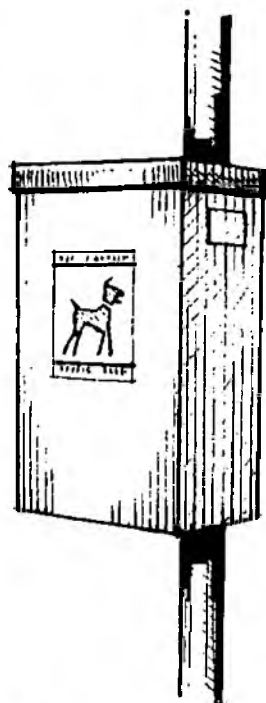
## 3.2 FURNITURE: LITTER BINS

### 3.2.5 DOG HYGIENE BINS

1 OF 1



A



B

#### SPECIFICATIONS

Height:

A: 550mm

B: 60/870mm

Capacity:

A: 40 litres

B: 45/66 litres

Finish:

A: various coloured PVC (other colours are available for orders over 50 units)

B: red or green painted steel with rubbertex lid (other colours can be provided on request)

Liner:

A: galv. steel liner to take polythene sack by the manufacturer or any other heavy duty sack

B: heavy duty plastic liner required which attaches to integral clips

Fixing:

A/B: wall mounted or mounted to post, preferably to existing post

Optional penalty sign available for B if required by local by-laws

#### USAGE

Suitable for rural and semi-rural locations

Preferable colours include black and dark green

Locate close to footpaths and other accessible areas

#### NOTES

Bins should be incorporated only if required by Local Authorities

Litterbins to be installed on site only where there is a refuse collection scheme in operation

Refer to: **Part C 1.0 Suppliers**

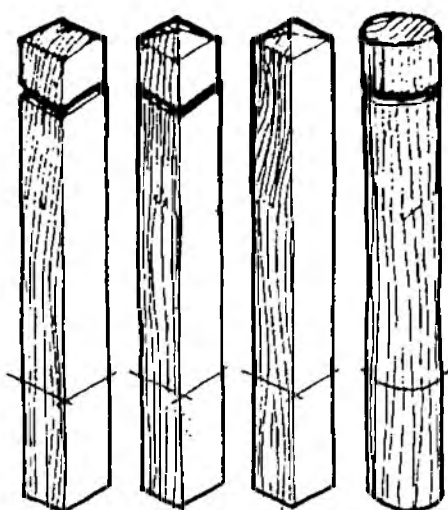
Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
● Low + Medium ● High –	● Good + Medium ● Poor –	● Good + Medium ● Poor –	● Low + Medium ● High –	● Good + Medium ● Poor –	● Good + Medium ● Poor –	<b>S/U</b> Rural R Semi rural S Urban U

## 3.3 FURNITURE: BOLLARDS

### 3.3.1 TIMBER BOLLARDS

SCALE 1:20

1 OF 1



#### SPECIFICATIONS

Height above ground level

900–1200mm, 150 x 150–200mm square diameter

Material: tropical hardwood or softwood

Finish: natural timber finish exterior wood stain finish as option if required

Fixing: below ground/concrete footing

Options: removable bollard with sleeve. Eye-bolts for chain attachment

#### USAGE

Suitable for rural and informal semi-rural sites

Allow 1.5m maximum spacing between bollards to prevent vehicular access

#### NOTES

Timber may be treated with wood oil or dark wood stains if necessary, to manufacturer's specification

Preferable wood stain colours to be dark shades

Ensure that timber meets requirements of NRA's Environmental Policy

Choice of timber will affect durability and costs



Refer to: 1.1.1 Car parks: Design guidelines / Part C 1.0 Suppliers

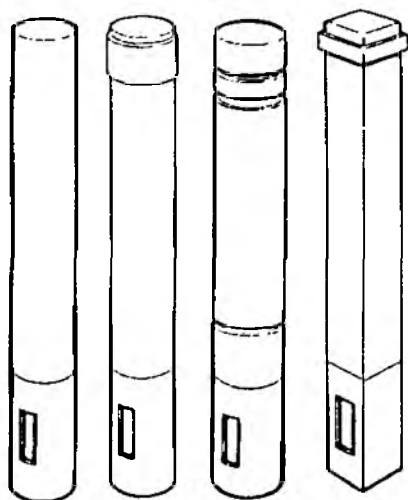
Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
● Low + Medium ● High –	● Good + Medium ● Poor –	● Good + Medium ● Poor –	● Low + Medium ● High –	● Good + Medium ● Poor –	● Good + Medium ● Poor –	<b>R/S/U</b> Rural R Semi rural S Urban U

## 3.3 FURNITURE: BOLLARDS

### 3.3.2 STEEL BOLLARDS

SCALE 1:20

1 OF 1



#### SPECIFICATIONS

Height above ground level  
900mm – various diameters

Material: tubular steel, tubular steel with cast metal cap

Finish: metal primer paint coating as standard finish  
(not galv. unless requested) or polyester powder coated in  
various colours by manufacturer

Fixing:

Set in concrete footing

Options

Can be supplied with foot flange plate, hinge plate

Sleeve for removable bollard

Eye bolts for chain attachment

#### USAGE

Suitable for urban and more formal semi-rural sites

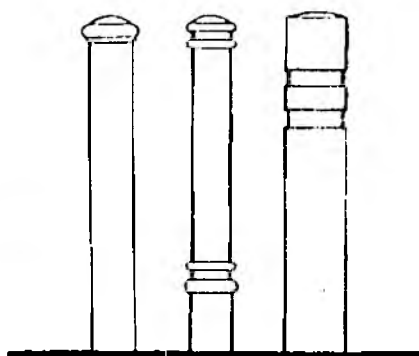
Allow 1.5m maximum spacing between bollards to prevent  
vehicular access

#### NOTES

Preferable colours for metalwork include black, dark red  
and blue

Bands not to be painted separate colours

Damaged paintwork can be repainted with external quality  
metalwork paint



Refer to: 1.1.1 Car parks: Design guidelines / Part C 1.0 Suppliers

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
● Low + Medium ● High –	● Good + Medium ● Poor –	+	+	●	Good + Medium ● Poor –	<b>U</b> Rural R Semi rural S Urban U

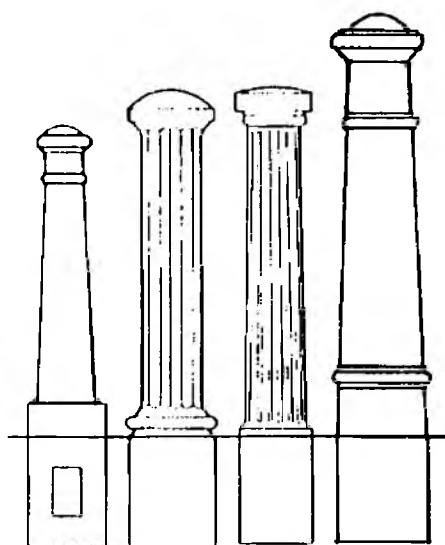


## 3.3 FURNITURE: BOLLARDS

### 3.3.3 CAST METAL BOLLARDS

SCALE 1:20

1 OF 1



#### SPECIFICATIONS

Height above ground level:  
various heights and diameters

Material: available in cast iron spheroidal graphite or  
aluminium depending on manufacturer

Removable bollard option to be made from lightweight  
cast aluminium

Finish: metal primer paint coating as standard finish

Fixing: set in concrete footing

Options:

Eye bolts for chain attachment

Removable bollard with sleeve

#### USAGE

Only suitable for urban sites within heritage and  
conservation areas

However, modern alternative should also be considered

Allow 1.7m maximum spacing between bollards to prevent  
vehicular access

#### NOTES

Preferable colours for metalwork include black, dark red  
and blue

Bands not to be painted separate colours

Damaged paintwork can be repainted with external quality  
metalwork paint

Refer to: 1.1.1 Car parks: Design guidelines / Part C 1.0 Suppliers

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
—	●	+	+	●		<b>U</b>
Low + Medium ● High —	Good + Medium ● Poor —	Good + Medium ● Poor —	Low + Medium ● High —	Good + Medium ● Poor —	Good + Medium ● Poor —	Rural R Semi rural S Urban U

## 3.4 FURNITURE: SIGNS AND WAYMARKERS

### 3.4.1 DESIGN OF INTERPRETATION BOARDS

1 OF 1

#### FUNCTION:

An interpretation board is not an amenity, instructional or directional sign. It usually contains a combination of exploratory text, drawing, photographs or map imaginatively presented to tell a story about an object or place.

Signs and boards should be kept to a minimum and should be grouped and coordinated, to avoid cluttering both urban and rural sites.

#### INITIAL CONSIDERATIONS:

The production of good interpretation boards requires considerable expertise and is a field best left to a graphic designer. During an initial briefing a designer will need details of:

- **audience**, those for whom the boards are primarily intended eg. secondary schools, families, infants, etc.;
- **the theme** which needs to be communicated. Involve the designer at the earliest possible time, as he/she is devoid from the subject he/she can interpret what information is most important;
- **life span requirement**, if you are sure that the information will not need to be changed and that there is little chance of vandalism use the most durable/expensive materials;
- **budget**;
- **maintenance**, budget for maintenance. Panels will have to be inspected and cleaned occasionally especially in vandal prone areas
- **siting, size, material, colour, framing and mounting** must be related to anticipated location on site;
- **black and white or colour**, for plant species/bird plumage illustrations colour half tones may be required in which case you will be limited to certain processes;
- **urgency**, this has an impact on the final cost.

#### MATERIALS

A wide range of materials is available, each having different qualities and costs, the following notes are only intended as an introduction to the subject, seek professional advice before making a decision:

- **Aluminium**: screen printed boards limited to A4 in size. Separate colours need individual application. Poor durability and subject to vandalism.
- **Polycarbonate**: the toughest material available with a long life and forms an ideal base to an extensive range of graphic techniques. If seriously defaced can be refurbished.
- **Glassfibre (embedded printed paper)**: paper is printed in the required colours and then laid in the glassfibre laminate.
- **Glassfibre (no paper)**: as above but printed graphics are applied without use of paper and hand colouring can be used.
- **Melamine**: a very hard scratch resistant melamine resin is laid over the paper.
- **Plastic panels**: image is screen-printed on front of panel, a budget option which does not offer the vandal resistance of more costly options.
- **Routed wood**: durable and vandal resistant, wood is obviously most appropriate in rural and semi-rural locations. The limitation is lack of design flexibility compared with other systems.

Further decisions have to be made concerning how the chosen board material is to be framed – softwood, hardwood, mild steel and glassfibre are all possibilities, a decision can only be made with knowledge of the site context.

## 3.4 FURNITURE: SIGNS AND WAYMARKERS

### 3.4.2 DESIGN GUIDELINES ON LOCATION

1 OF 1

#### LOCATION:

A thoughtlessly located board can create an eyesore rather than a feature.

The following is a checklist of considerations required when locating interpretation boards:

- where possible site the panel against a background of a wall, vegetation or bank so it does not stick up above the horizon.
- rather than constructing a separate structure is it possible to incorporate the panel into an existing structure?
- are there other signs in the vicinity which could be incorporated into one panel or at least gathered together onto one post and coordinated in style?
- do not place an interpretation board in full sunlight as this will hasten deterioration of most materials, fade graphics and cause uncomfortable glare;
- a hard surface may be required in the vicinity of the board, to prevent trampling of the surrounding surface;
- boards should be placed in a location which is accessible for wheelchairs and the infirm and the text placed at a suitable height. Average wheelchair seated eyelevel is male: 1219mm and female 1110mm.

#### SIGNS & WAYMARKERS:

the following is a checklist of points to consider when locating signs and waymarkers:

- waymarks are only required where they are necessary for a stranger to follow a path;
- only public rights of way should be waymarked with the standard blue or yellow arrow (see 3.4.3).
- in cases where paths are not public rights of way a different colour arrow should be used, or fingerpost stating the destination;
- where a suitable gate post, wall or tree exists it is wise to utilise this to paint on the standard arrow (see 3.4.3).
- the arrows are used in the same manner as traffic signs, so that a vertical arrow means straight ahead and a horizontal arrow indicates a change of direction through 90°. Arrows should be fitted consistently at the same height and in the same pattern.

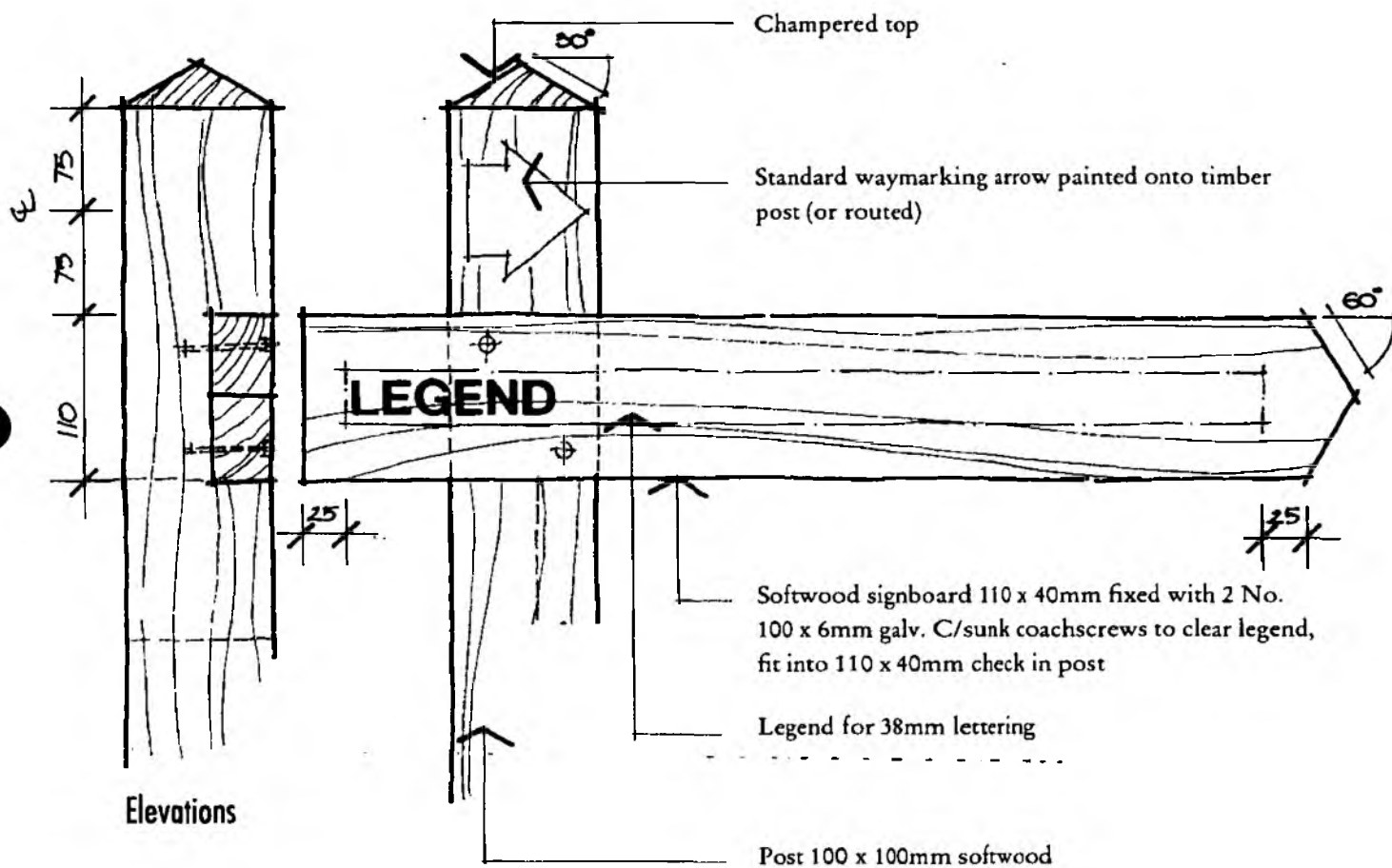
Remember to consult your public relations department regarding corporate style.

## 3.4 FURNITURE: SIGNS AND WAYMARKERS

### 3.4.3 TIMBER WAYMARKERS

SCALE 1:5

1 OF 2



#### Plan

Source: LUC, adapted from information sheet, Countryside Commission for Scotland (now Scottish Natural Heritage)

#### NOTES

All softwood to be pressure impregnated to BS 1282 (1975)

All waymarking arrows to use correct colours as indicated

#### USAGE

Finger-post waymarkers are only really necessary where a footpath begins, i.e. adjacent to a road or carpark edge

Refer to: **3.4.2 Design guidelines on location**

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
•	•	+	+	+		<b>R/S</b>
Low + Medium • High –	Good + Medium • Poor –	Good + Medium • Poor –	Low + Medium • High –	Good + Medium • Poor –	Good + Medium • Poor –	Rural R Semi rural S Urban U

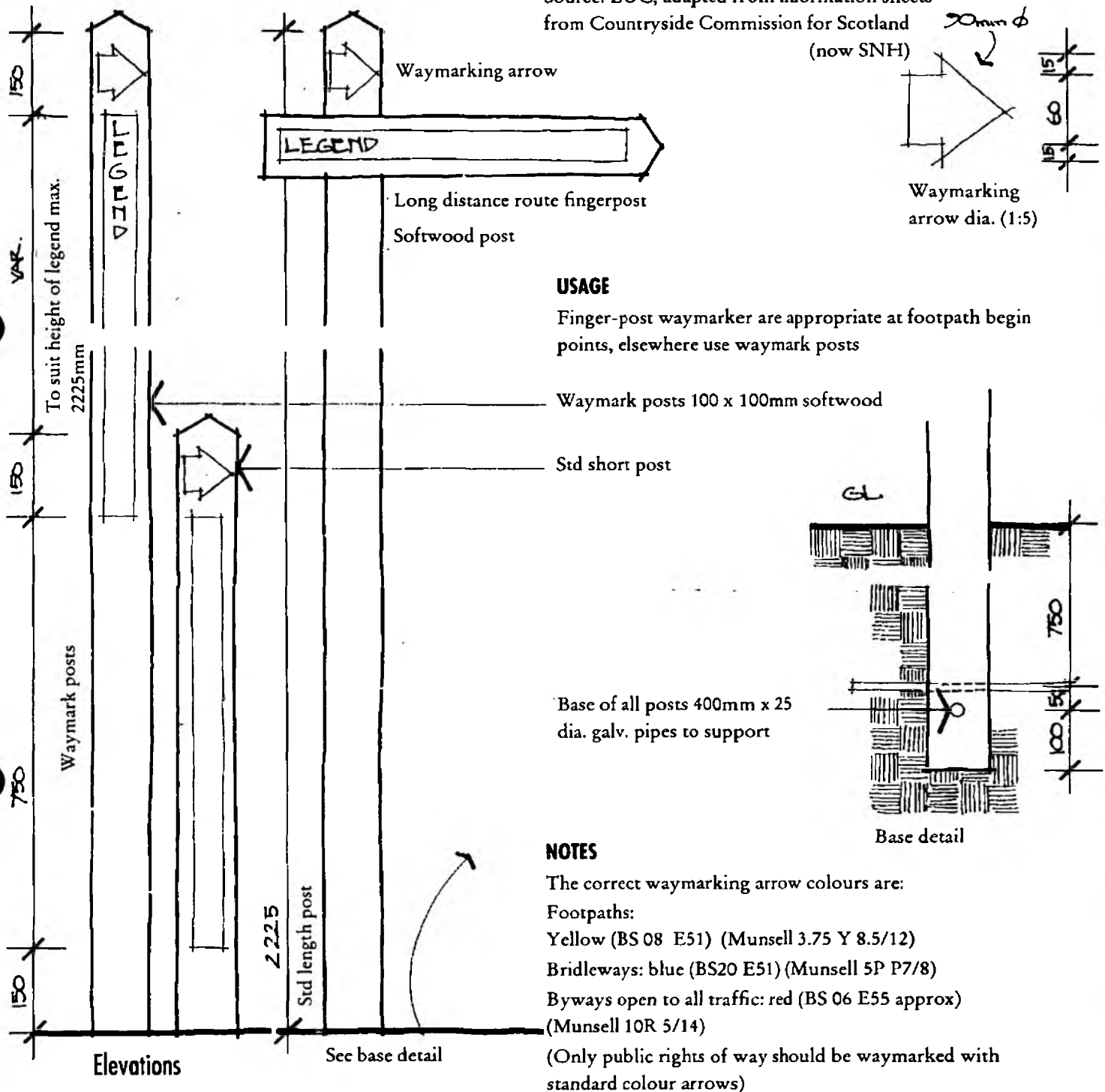
## 3.4 FURNITURE: SIGNS AND WAYMARKERS

### 3.4.3 TIMBER WAYMARKERS

SCALE 1:10

2 OF 2

Source: LUC, adapted from information sheets  
from Countryside Commission for Scotland  
(now SNH)



Refer to: **3.4.2 Design guidelines on location**

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
•	•	+	+	+		<b>R/S</b>
Low + Medium • High -	Good + Medium • Poor -	Good + Medium • Poor -	Low + Medium • High -	Good + Medium • Poor -	Good + Medium • Poor -	Rural R Semi rural S Urban U

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## PART B

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### 4.0 SPECIALIST ITEMS

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NRA

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## 4.1 SPECIALIST ITEMS: FISHING PLATFORMS

### 4.1.1 FISHING: DESIGN GUIDELINES

1 OF 1

Fishing can be either on an informal basis or as an organised competitive sport.

**Banks:**

The shape of the bank edge will influence the number of anglers that can be accommodated and a large length of bank side in proportion to surface water area will enable fishing capacity to be maximised. 15 rods to the hectare provides an average guideline. Anglers generally require quiet conditions and angling 'stations' should be located 15–20m apart. Banks profiles should be gentle to provide easy access to the water. To prevent erosion to the banks and disturbance to marginal vegetation it may be preferable to construct permanent fishing platforms.

**Access:**

To fishing platforms should include sloped ramps including gradients suitable for wheelchair users.

**Siting:**

Anglers generally prefer sheltered locations set away from main access paths or car parks in informal, rural surroundings. Natural topography and vegetation can help to shelter and screen angling positions. However competitive angling requires long, clear banks. Where fishing platforms are provided for disabled anglers, care should be taken not to separate them from other fishermen.

**Fishing platforms:**

These should be small individual platforms catering for 1–2 people rather than a continuous strip. A low wheel stop or trip rail (100–150mm) can be added along the water's edge as an extra precaution. Where the fishing platform projects over the water, protective side railing and a single protective horizontal bar 350mm minimum height in the front, which does not hinder fishing operations, should be considered.

**Ancillary facilities:**

Car parking for anglers may be necessary depending on remoteness of site, however to facilitate use by disabled people some car parking should be located in close proximity to the fishing areas and paths should be constructed using the guidelines set out in 1.8.1.

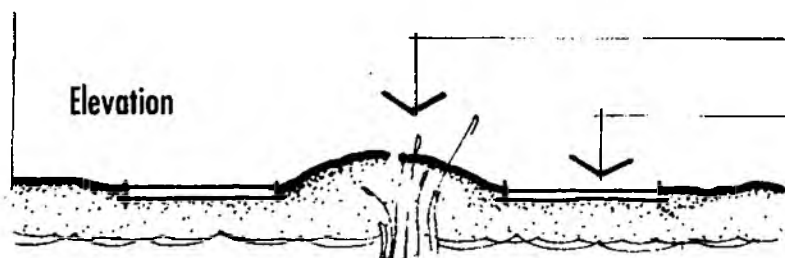
**Consultation:**

If you are planning to provide fishing platforms for anglers disabled or able-bodied ensure that you consult fully with those who are to use them – this is particularly important when deciding on access.

## 4.1 SPECIALIST ITEMS: FISHING PLATFORMS

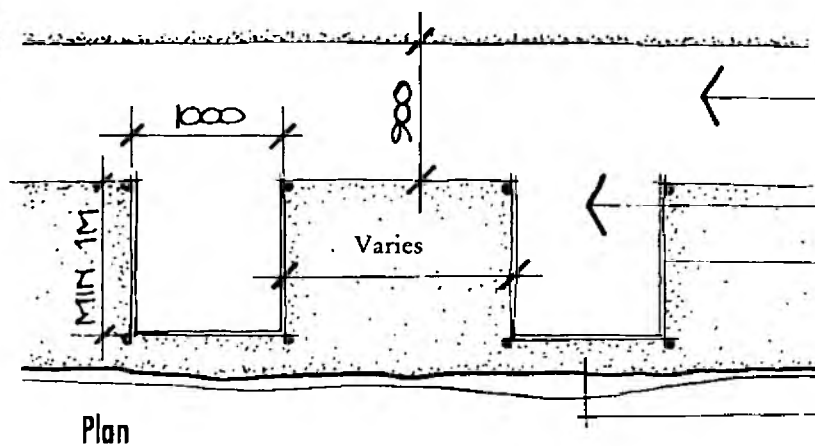
### 4.1.2 FISHING PLATFORMS: EXAMPLE LAYOUTS

1 OF 1



Topsoil removed from path and placed on banks  
Fishing station surface must not slope towards water

Low bank angling station

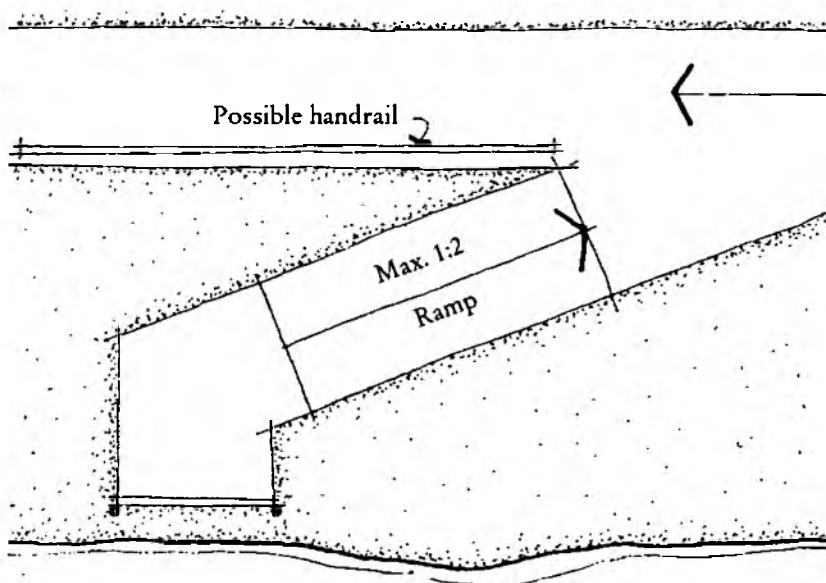


Path

Fishing station

Timber edge 150mm

Retain strip of land in front of station to allow rod rests to be placed in ground



Path

Soil from station should be used to form level base and to make platform stand proud of bankside

#### USAGE

Suitable for rural and semi-rural locations where bank provides easy access to water

#### NOTES

Upstand edge allows safe wheelchair access  
Land drainage consent is required from the NRA prior to construction

Steep bank: Access by sloping path

Source: LUC, adapted from National Anglers Council, Countryside Commission (1994)



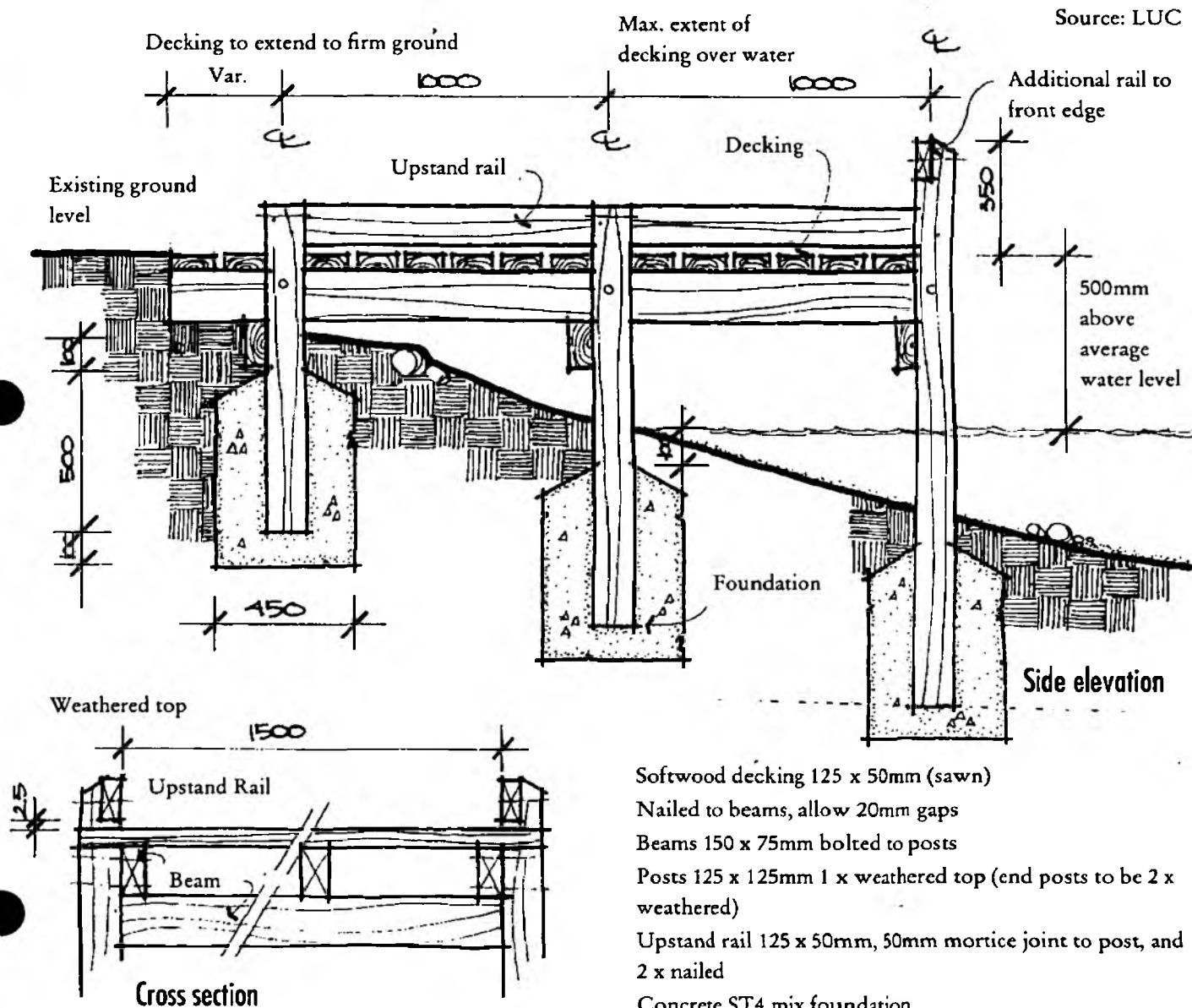
#### 4.1 SPECIALIST ITEMS: FISHING PLATFORMS

### 4.1.3 FISHING PLATFORM DETAIL

**SCALE 1:20**

1 OF 1

Source: LUC



## USAGE

Suitable for rural and semi-rural locations where change in water level are slight

Required where water depths are too shallow to reach fishable water from bank

Upright rail can be omitted where no wheelchair use is anticipated

## NOTES

**All softwood pressure impregnated to BS 1282 (1975)**

**All steel fixings and fixtures galv. steel to BS 729 (1986)**

### Users of the platforms may require locking mechanisms

Platform can be used for dipping

Refer to: **1.8 Access for oil / 4.1.1 Fishing: Design guidelines / Fishing platforms: Example layouts**

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
●	●	+	+	+	+	<b>R/S</b>
Low + Medium ● High —	Good + Medium ● Poor —	Good + Medium ● Poor —	Low + Medium ● High —	Good + Medium ● Poor —	Good + Medium ● Poor —	Rural R Semi rural S Urban U

## 4.2 SPECIALIST ITEMS: BIRD HIDES

### 4.2.1 DESIGN AND LOCATION GUIDELINES

1 OF 1

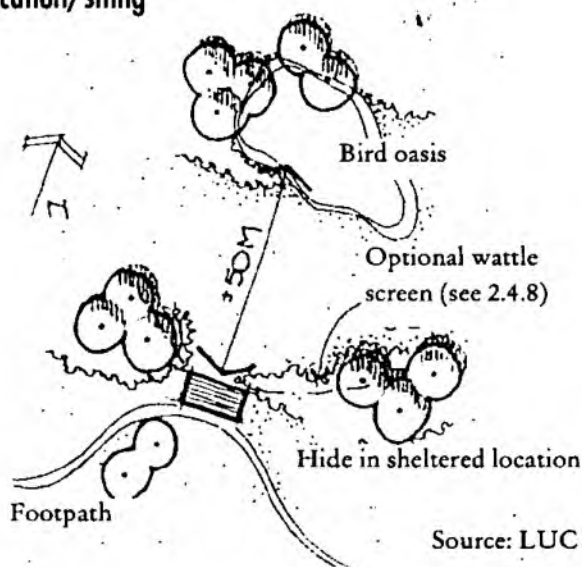
The purpose of a hide is simply to provide a secluded and hidden viewing point from which to observe birds without disturbing them.

In practice the production of bird hides tends to be limited to a few specialist suppliers who advise, design, supply (and can construct) a hide to a standard or an adapted format. It is therefore necessary to discuss exact requirements with the manufacturer. Criteria to consider include:

#### Location/Siting:

The hide should overlook a bird 'oasis' such as a pool, major feeding ground etc. Although orientation may be limited due to site conditions it is preferable to have the hide facing north to avoid direct sunlight to the viewers. The hide should be sited at least 50 metres away from the source of birds so that visitors to the hide do not disturb the birds. In addition the entrance should be at the back or side of the hide and can be further screened by the use of wattle screens.

#### Location/siting



#### Size:

Standard hides are 1.7m wide with 1.8m modular lengths i.e. 3.6, 5.4, 7.2, 9m etc. As a guideline a 3.6m length hide will easily accommodate a single row of 6 seated people.

#### Capacity/Users:

The size of bird hide will be dependent on the approximate number and type of users. Users may vary from keen amateurs who would require plenty of space and quiet, to organised school parties where use of the hide can be doubled with 1 row sitting, 1 row standing, to curious passers-by who can be accommodated within either scenario.

#### Elevation above ground level:

This will vary with site conditions but should be at least 760mm above ground. Steps or a ramp for wheelchair users will be required to reach the entrance.

#### Viewing slots:

380mm is the standard depth which can be reduced to 250mm depth where birds are more vulnerable to disturbance. These can be along 1 or 3 walls. Shutters to these are usually timber, but can be glass or acrylic providing a more sheltered look out.

#### Benches:

Usually single row but a second narrow bench at the rear of the hide can be incorporated to allow for people waiting to use the viewing slots. Benches should be free-standing to allow people to sit without having to swing their legs over.

#### Sleeping wardens:

These are optional angled plywood boards beneath the viewing slots for mounting permanent information.

#### Doors:

These should be located to the rear or side of the hide to prevent disturbance to the birds and should be 940mm wide to allow wheelchair access.

#### Access for all:

Wheelchair use can be accommodated by adapting a section of the hide, omitting the bench, allowing additional leg room and lowering the height of the viewing slots.

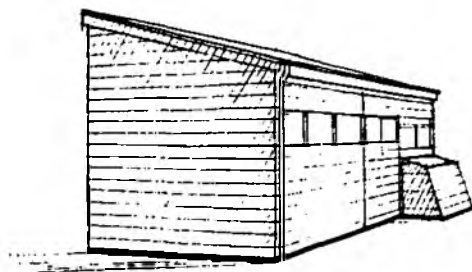
#### Construction:

Bird hides can be produced in kit form with instructions for erection by others. Alternatively the manufacturers can erect them.

## 4.2 SPECIALIST ITEMS: BIRD HIDES

#### 4.2.2 HIDE DETAIL

1 OF 1



**1. Hide elevation  
with section  
adapted for  
wheelchair users**

Source: Adapted from Gilleard Brothers, Scunthorpe

## SPECIFICATIONS

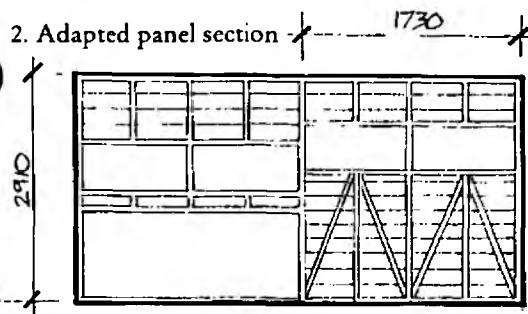
Size: 1700 width x 1800mm modular lengths

**Material: softwood timber and brown corrugated roof sheeting**

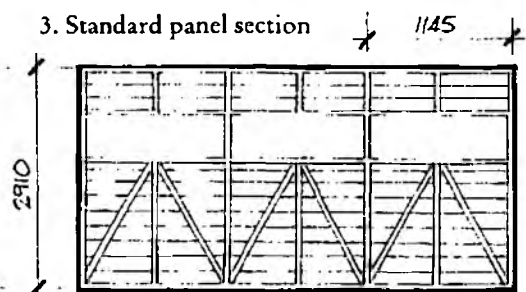
**Finish: tanalith treated timber with dark brown preservative coating**

## NOTES

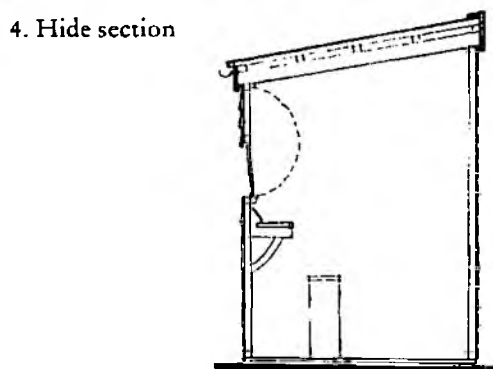
### Birdhides may be adapted to accommodate wheelchair users



2. Adapted panel section - 1730



3. Standard panel section 1145

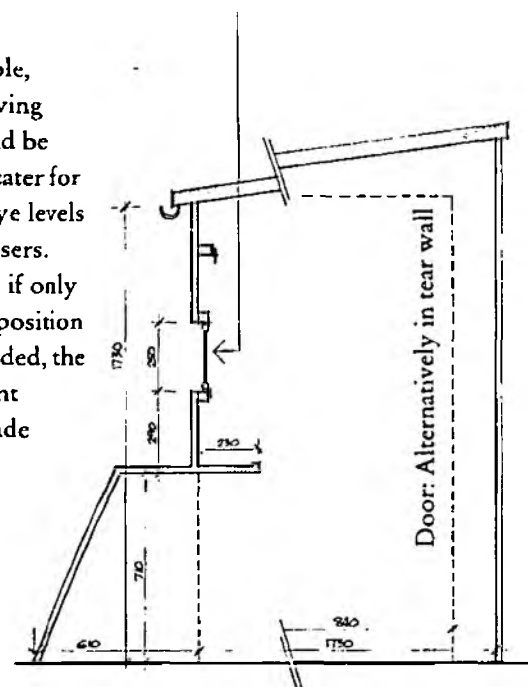


#### 4. Hide section

Viewing slot: 840mm long with  
907 kg glass

Inset: hinged opening

Where possible, different viewing heights should be provided to cater for the various eye levels of different users. Alternatively if only one viewing position is to be provided, the viewing height should be made variable.



## Section

Source: RSPB

Refer to: **1.8 Access for all / 4.2.1 Design and location guidelines**

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
—	—	+	●	+	+	<b>R</b>
Low + Medium ● High —	Good + Medium ● Poor —	Good + Medium ● Poor —	Low + Medium ● High —	Good + Medium ● Poor —	Good + Medium ● Poor —	Rural R Semi rural S Urban U

## 4.3 SPECIALIST ITEMS: TOILET FACILITIES

### 4.3.1 TOILET FACILITIES: DESIGN GUIDELINES

1 OF 1

Toilet facilities should only be considered in very well visited locations where an obvious need is present and the infrastructure/maintenance is available to ensure they can be properly serviced and remain in a presentable condition. If future maintenance is likely to be problematic it is perhaps wise not to supply the facility.

#### Checklist:

of points for consideration.

- is a power supply available?
- is there a local foul water system available which can be utilised? If not the design must incorporate a septic tank and allow collection by a sludge tanker, or involve chemical toilets which require collection;
- is a mains water supply available? if not a header tank will be required to supply washbasins, and/or flushing;
- lavatories are usually best sited adjacent to a carpark, so one normally presumes vehicle access is available for servicing;
- in localities where there are no available utilities or discharge facilities the new generation of composting toilets might be considered. These are already widely used in U.S.A. National Parks.

At an early stage it is important to seek specialist advice to determine the viability of the proposal.

The number of lavatory facilities to be provided is not easily calculated, but can be based on the following formula having calculated the peak summer attendance expected (numbers on site at any one time):

appliances	for male use	for female use
WCs	1 per 100	2 per 100
urinals	1 per 25 persons	
washbasins	1 WC & 1 for 5 urinals	1 per 2 WCs

A disabled facility must also be incorporated and ideally facilities for baby-changing within the same room.

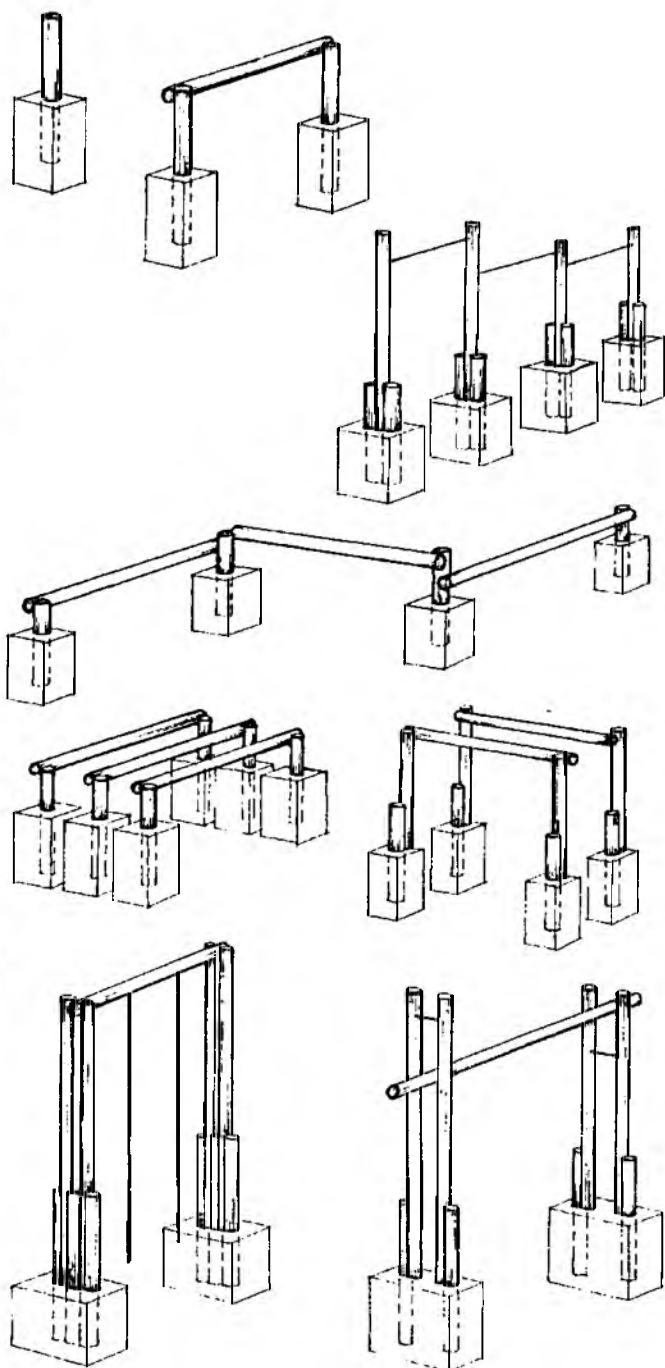
#### Siting and design:

Once a decision is made to install a facility it is essential to seek professional advice on the siting and design of the facility. In the past public lavatories have been epitomised by ugly illmaintained buildings unrelated to their settings this can be avoided with proper design input and aftercare.

## 4.4 SPECIALIST ITEMS: FITNESS EQUIPMENT

### 4.4.1 PROPRIETARY TRIM TRAILS

1 OF 1



#### SPECIFICATIONS

Materials: treated softwood and galv. metal fixings

Finish: natural timber finish

Fixings: below ground

#### USAGE

Suitable for urban and semi-rural sites

Work stations can be sited along a jogging track/pathway to form a fitness circuit

Allow maximum intervals between stations as follows:

10 stations: 50m intervals

12 stations: 85m

15 stations: 100m

(One may want to group stations)

#### NOTES

All softwood pressure impregnated to BS 1282 (1975)

All fixings galv. to BS 729 (1986)

All fixings galv. to BS 729 (1986)

Signage may be necessary to show total circuit and individual station activity

Refer to Sports Council recommendations with regards to suggested layouts

#### Typical Trim-Trial Stations

Refer to: **Part C 1.0 Suppliers**

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
—	+	+	●	●	—	<b>S/U</b>
Low + Medium ● High —	Good + Medium ● Poor —	Good + Medium ● Poor —	Low + Medium ● High —	Good + Medium ● Poor —	Good + Medium ● Poor —	Rural R Semi rural S Urban U

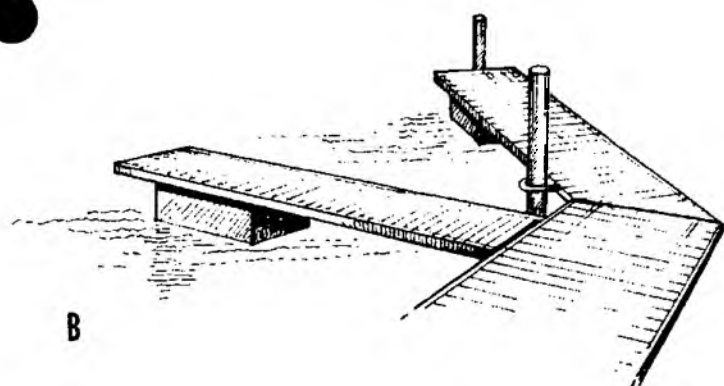
## 4.5 SPECIALIST ITEMS: BOATING AND MOORING FACILITIES

### 4.5.1 PROPRIETARY PONTOONS AND JETTIES

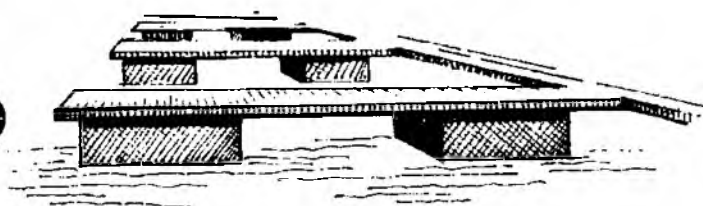
1 OF 2



A



B



C

#### SPECIFICATION

Size: available in various modular widths and lengths

A. Pontoons: 1.5/1.8/2.5m width x 7.5/11.5m Length

Finger pontoon: 0.5/0.7/1.0m width x  
3.0/4.5/6.0/7.5/9.0/10.5m length

B. Pontoons:

2.0/2.4m width x 8/10/12m length

Finger pontoons:

0.7 x 6m length

0.8 x 8/9/10m

1.0 x 1.2m

C. Pontoons: 2m x 8m length

Finger pontoons: 1m width x length to suit (normally  
between  
6-9m)

Jetties: generally made to suit, but as modular units

Main jetty: 2-2.5m x 4m length

Finger jetty: 1 x 4m length

#### Materials

A. Planed and grooved hardwood boards on mild steel and  
fibre concrete/polystyrene floating base

B. Hard or softwood into floating base as A

C. Pine, floating Base as A

Mooring cleats to pontoons are fitted as standard

Fixing: generally pontoons are supplied and fixed by  
manufacturer

Refer to: 1.8 Access for all / 4.5.3 Proprietary mooring fixings / Part C 1.0 Suppliers

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
—	—	+	+	•	—	<b>R/S/U</b>
Low + Medium • High —	Good + Medium • Poor —	Good + Medium • Poor —	Low + Medium • High —	Good + Medium • Poor —	Good + Medium • Poor —	Rural R Semi rural S Urban U

## 4.5 SPECIALIST ITEMS: BOATING AND MOORING FACILITIES

### 4.5.1 PROPRIETARY PONTOONS AND JETTIES

2 OF 2

#### NOTES

Pontoons and jetties can be linked to bankside with optional access ramps supplied by manufacturers or 'free standing' within water body

Jetties are generally preferable to pontoons since they provide a rigid platform for users

Jetties are generally cheaper than pontoons to supply but installation costs may be higher

Jetties require pile driving of foundations either from bank-side or floating mooring.

Softwood is cheaper but less durable

Land drainage consent is required from the NRA prior to construction

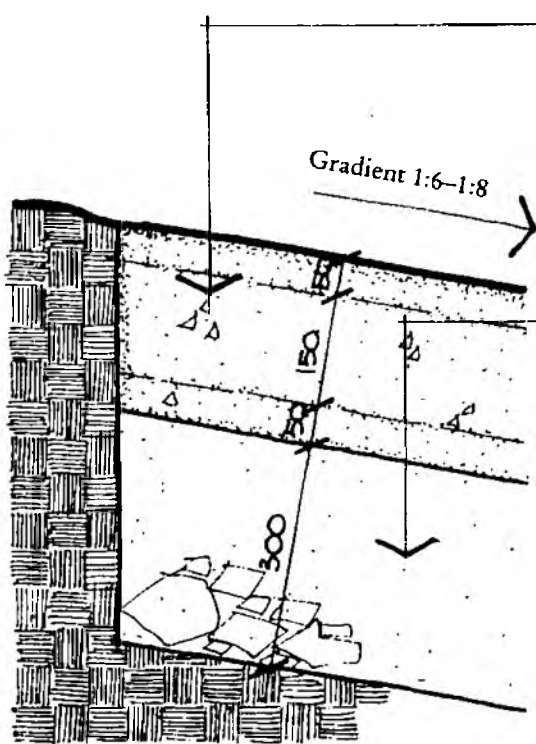
Refer to: **1.8 Access for all / 4.5.3 Proprietary mooring fixings / Part C 1.0 Suppliers**

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
—	—	+	+	●	—	<b>R/S/U</b>
Low + Medium ● High —	Good + Medium ● Poor —	Good + Medium ● Poor —	Low + Medium ● High —	Good + Medium ● Poor —	Good + Medium ● Poor —	Rural R Semi rural S Urban U

4.5 SPECIALIST ITEMS: BOATING AND MOORING FACILITIES

4.5.2 CONCRETE SLIPWAY

SCALE 1:10 1 OF 1



Concrete ST4 mix laid to a depth of 250mm in three layers:  
1st layer 50mm compacted and polymer grid laid over;  
2nd layer 150mm compacted and polymer grid laid over;  
3rd layer 50mm compacted and levelled to final 1:6-1:8  
Gradient and finished with brushed or ribbed surface

300mm DoT type 1 sub-base compact granular fill

USAGE

A detail for all locations where a permanent slipway is required for boat launching. Detail is suitable for light vehicular traffic and should extend a min of 6.0m from the average water level, into the water

NOTES

Concrete pigment may be used in finishing layer to lessen visual impact of concrete pigment to BS 1014 (1975)

For polymer reinforcement grid and waterproof polyethylene expansion filler supplier. See Part C

Expansion joints to be 25mm wide, max. panel size 10m<sup>2</sup>

Use polyethylene filler board

Finished with pitch polyethylene sealant all to BS 5212 (1990) and kite marked

Sealant 20mm deep and with recessed surface

Polymer grid to be taken across joints without cutting

Section

Source : LUC

Refer to: 4.5.1 Proprietary pontoons and jetties / Part C 1.0 Suppliers

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
—	—	+	+	●	●	<b>R/S/U</b>
Low + Medium ● High —	Good + Medium ● Poor —	Good + Medium ● Poor —	Low + Medium ● High —	Good + Medium ● Poor —	Good + Medium ● Poor —	Rural R Semi rural S Urban U



4.5 SPECIALIST ITEMS: TOILET FACILITIES

4.5.3 PROPRIETARY MOORING FIXINGS

1 OF 1



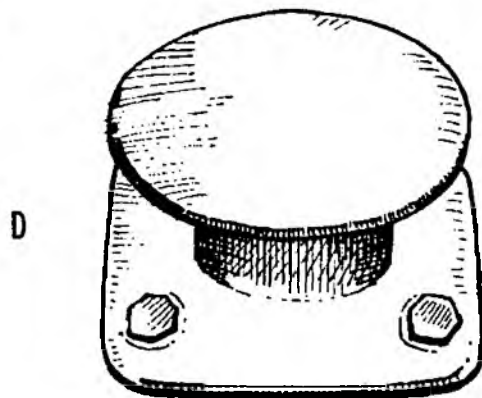
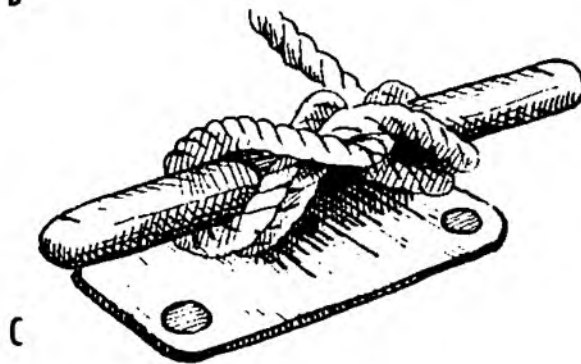
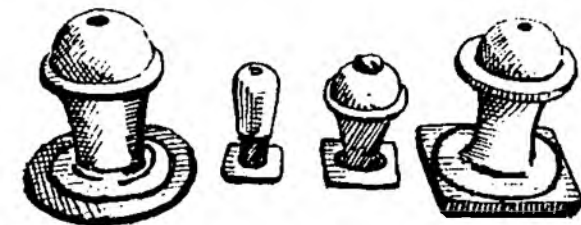
SPECIFICATION

Material: cast aluminium

Fixing: bolted to suitable surface

USAGE

Suitable for all locations



Refer to: 4.5.1 Proprietary pontoons and jetties / Part C 1.0 Suppliers

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
●  Low + Medium ● High —	+  Good + Medium ● Poor —	+  Good + Medium ● Poor —	+  Low + Medium ● High —	●  Good + Medium ● Poor —	  Good + Medium ● Poor —	<b>R/S/U</b>  Rural R Semi rural S Urban U

## 4.6 SPECIALIST ITEMS: CANOE FACILITIES

### 4.6.1 CANOEING: DESIGN GUIDELINES

1 OF 1

Canoeing can include: Competition Polo; Competition Sailing; Marathon Racing; Spring Racing; Slalom and Wild Water Racing and Touring. Predicted demand and type of user for each site needs to be assessed in consultation with the appropriate sports clubs.

#### Size of Waterbody:

- Sprint: 1000m straight course (National competition standard)
- or in 250 or 500m lengths (local standard)
- 30–45m width (5m per lane). Also room for turning at ends of course.
- Marathon: Large area with triangular course or linear sections up to 31 km (18 miles).
- Small area of water (0.8ha+) suitable for training purpose or canoeing by schools, youth clubs etc.
- Slalom or Wild Water Racing: Where there is a drop of about 2m and a discharge of about 3 cumecs there is potential for an artificial white water course in the form of safe, natural or man-made weirs.

#### Depth of Water:

A minimum depth of 2m is required. Easy access to water is essential. Training areas to include 10m wide band of shallow water at edges for launching and initial instruction.

#### Banks:

Overhanging trees should be avoided as they could be dangerous. Where obstructions exist within water courses, land access along banks will be required.

#### Surrounding Topography:

Where water is to be used for competition the surrounding land form should provide shelter from the wind.

#### Infrastructure:

Road access, car parking and slipway/boat launching area (1:8 slope)

#### Ancillary Facilities:

Changing rooms (preferred). Canoeists usually share club facilities with other water users. Workshop (ideally). Racked canoe storage (optional). Spectator facilities enabling viewing along route or at finish line of competitions.

#### Consultation:

Contact your local British Canoe Union (BCU) representative or local canoe club.

## 4.6 SPECIALIST ITEMS: CANOE FACILITIES

### 4.6.2 CANOE LAUNCHING RAMPS

1 OF 1

1. Canoes/kayaks can be launched from almost anywhere. However a gentle slope, or a bank which is no more than 300mm above the water is ideal.
2. Artificial launching sites are very helpful where persons who are disabled, or 'more mature' are likely to be participating.
3. There are three main choices: (not in order of priority):
  - Floating pontoons
  - A sloping ramp (slipway)
  - A series of steps.
4. **Floating pontoons**
  - 4.1 Pontoons must have sufficient buoyancy to support the number of people likely to be able to stand on them, but the deck should not be more than 600mm above the water – ideally about 300mm.
5. **Sloping Ramps**
  - 5.1 A slope is ideal for disabled persons but this must not be steep – no more than 30 degrees.
  - 5.2 If the slope is to stop at the level which the river does not normally fall below, then warning signs should be posted.
  - 5.3 Bars across the slope are a useful adjunct to help prevent wheelchairs from running away.
  - 5.4 Slopes dissipate wash more happily than steps and pontoons if wash is a problem.
6. **Steps**
  - 6.1 Ideally, steps should be no more than 225mm high, and about 450mm wide. Where physical factors determine otherwise, however, the best that can be achieved is always acceptable. Again, where steps are to stop at a certain point they should be marked with a 'danger, deep water' sign.
7. Canoes/kayaks are from 3900mm (or less) long up to 9600mm for a 4-sea racing kayak.
8. A ramp from 900–3000mm across will allow one boat at a time to be launched.
9. A ramp length of 6000mm across would allow 600mm general purpose or touring boats to be launched at the same time.

## 4.7 SPECIALIST ITEMS: ROWING FACILITIES

### 4.7.1 ROWING: DESIGN GUIDELINES

1 OF 1

Rowing is predominately an organised competitive sport but can also be enjoyed on an informal basis eg. skiffing. Predicted demand and type of user will need to be assessed in consultation with the appropriate sports clubs.

#### Size of Water Body:

- (i) International standard venue: 2000m straight course, with extra 100m beyond the finish line. 100m width to accommodate 6 lanes x 15m, and 5m either side.
- (ii) Regional/local standard venue: ideally 1500m straight course with extra 50–100m beyond finish line. Minimum width 85m (ie. 6 lanes x 12.5) with 5m either side. Ideally 100m width (6 lanes x 15m) with 5m either side.
- (iii) Club rowing/training: 600–1500m length (not necessarily straight). A minimum of 25m wide to enable crews to train and race alongside each other. The water should be easily accessible to crews at one point. Minimum launching area is 12m but 30–40 metres is preferable. 50–60m width (3–4 lanes).
- (iv) Recreational rowing: Small areas of water (0.8ha+) will be suitable for recreational/leisure rowing.

#### DEPTH OF WATER:

For international courses a uniform depth is desirable to ensure equality of wave resistance between lanes. If the depth is irregular water depth should be over 3m at shallowest points. If depth is equal, water depth must be over 2m.

#### LOCATION/SITING:

Sheltered conditions are preferable.

#### BANKS:

Natural shelving edges with reed, rush etc. or gravels will absorb wash and reduce the reflection of waves (essential if the water is to be used for competition).

A coaching path available on one bank is useful.

#### WATER QUALITY:

Good water quality preferred.

#### INFRASTRUCTURE:

Road access, car park and slipway/launching area (1:8–1:10 slope) Landing stages of correct height essential.

#### ANCILLARY FACILITIES:

Changing rooms including hot showers, boat storage facilities, (essential), club house (optional – can be shared with other water users), workshops.

Spectator facilities enabling viewing at finish line and buoys, lane markers and fixings if water is to be used for competition.

#### ROWING FOR THE DISABLED:

The Amateur Rowing Association can give advice on adapting boats and facilities.

#### CONSULTATION:

Consult your local rowing club or representative of the Amateur Rowing Association.

## 4.7 SPECIALIST ITEMS: ROWING FACILITIES

### 4.7.2 ROWING: TECHNICAL INFORMATION

1 OF 3

#### Some basic boat dimensions

	Length	Width	Length with oars	Width
Play Boat	4.8m	1.4m	4.8m	5.2m
Racing Scull	8m	1.6m	8m	7.9m
Four	12m	1.6m	12m	8m
Eight	18m	1.6m	18m	8m

#### Some basic water dimensions for rowing

Four 1 off – 10m width lane (minimum), 12.5m lane (international)  
To turn the boat round, 14–15m (absolute minimum)

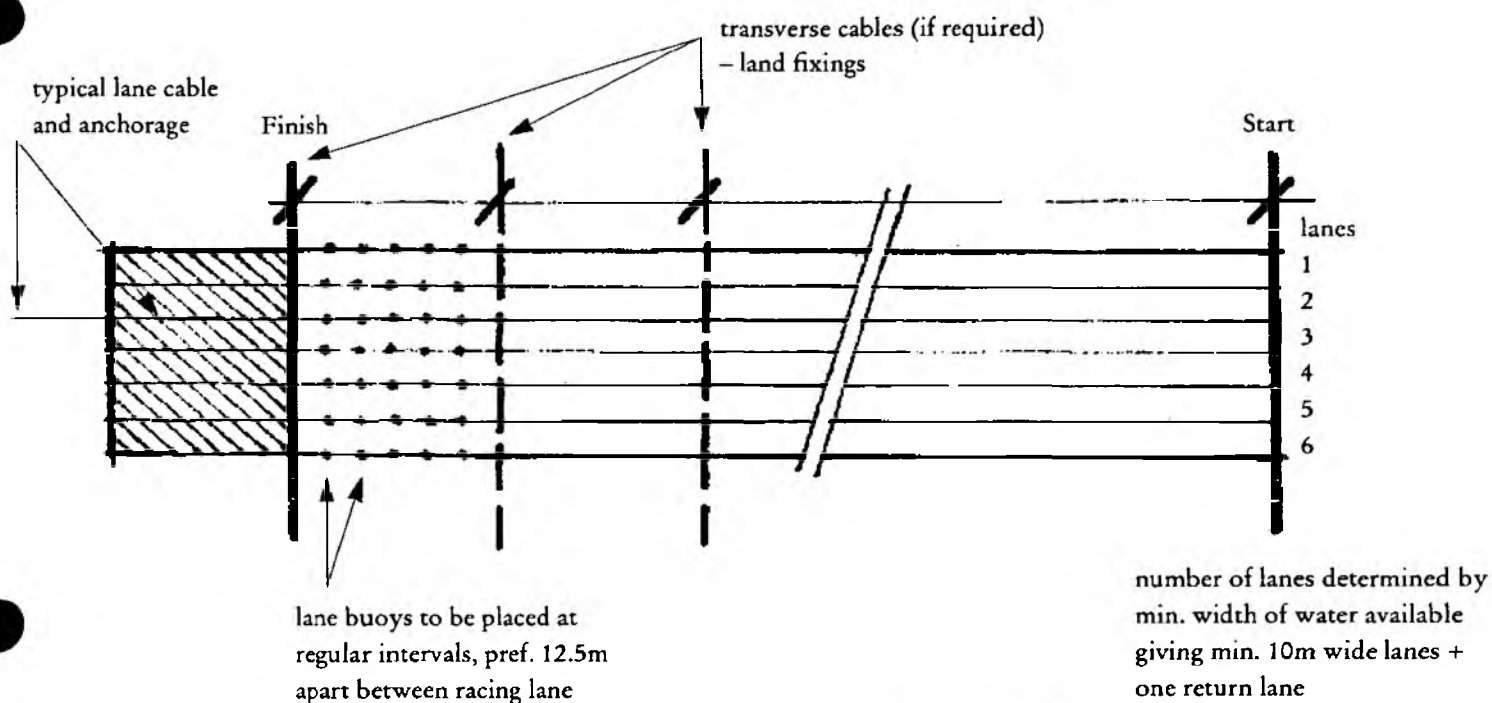
2 off – 2 x 10m width lanes (minimum)

For regular side by side racing, need 3 lanes (2 racing & 1 access or passing), hence the need for minimum of 30m width.

Eight – Widths are the same as for a four but would require a minimum of 25m to turn round.

Depth – Water less than 0.7–0.8m may give rise to some problems. In excess of 1m there will be no rowing problem but weed control in shallow water could present difficulties.

#### Schematic details of multi-lane rowing course

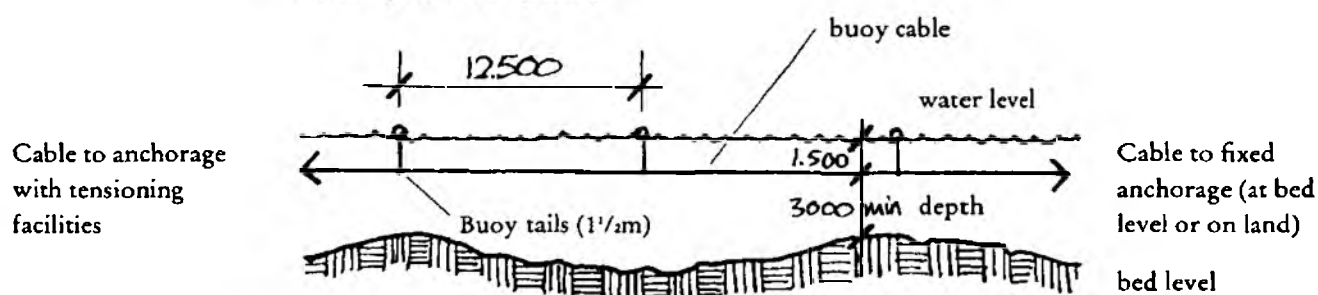


## 4.7 SPECIALIST ITEMS: ROWING FACILITIES

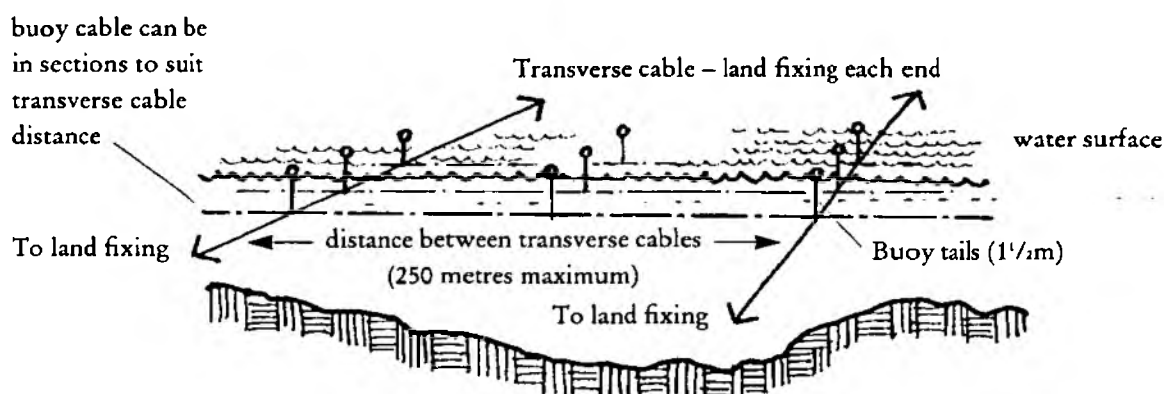
### 4.7.2 ROWING: TECHNICAL INFORMATION

2 OF 3

**Albano system of buoy fixing**



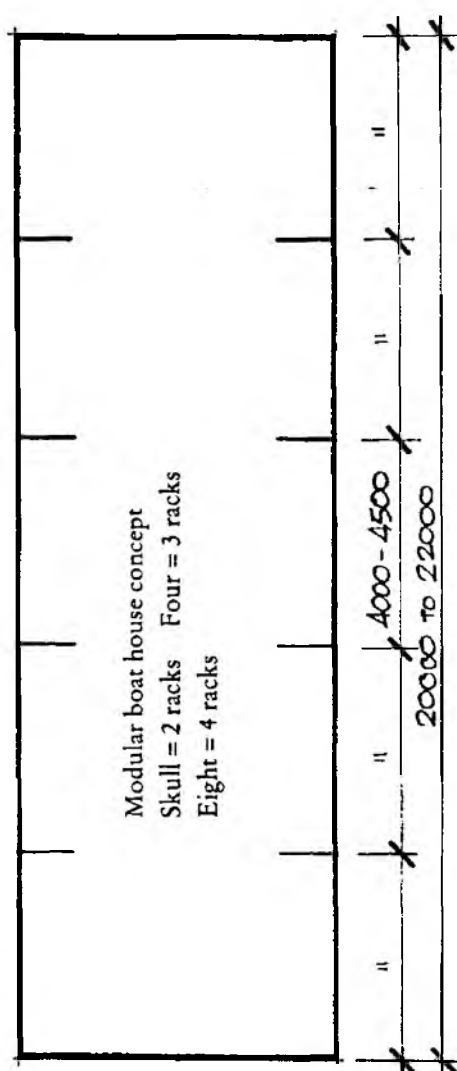
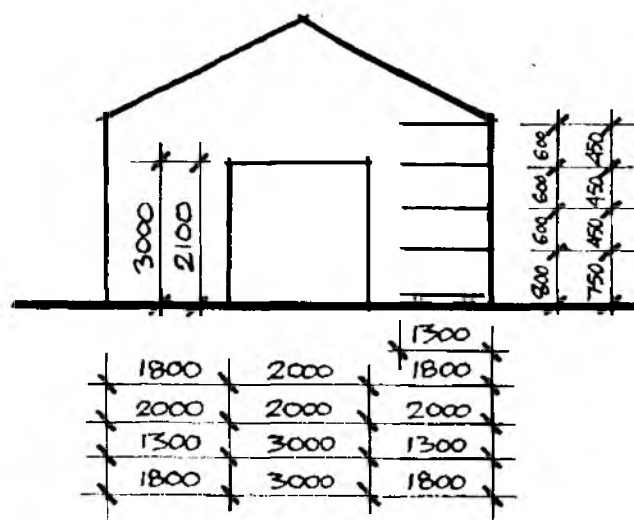
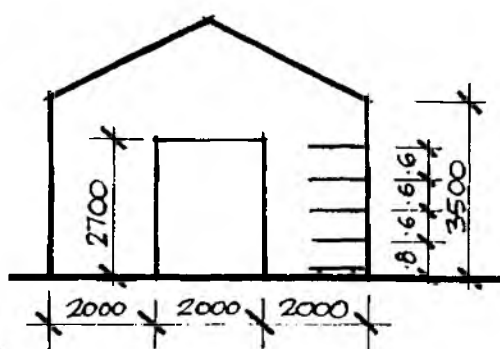
**Alternative buoy fixing – using transverse cables**



## 4.7 SPECIALIST ITEMS: ROWING FACILITIES

### 4.7.2 ROWING: TECHNICAL INFORMATION

3 OF 3



- A & H - Dimensions for fours storage and trailer access.
- B & E - Minimum storage for fours & small boats.
- B & F - Minimum storage for eights.
- B & G - Storage for fours with larger access doorway
- C - Rack spacing for fours & eights.
- D - Rack spacing for sculling boats, possible to go up to six boats high.

#### Racking supports:-

- 8+ - 3 x 5.2m
- 4+ - 2 x 5.4m
- 2- - 2 x 2.7m
- 1x - 2 x 2.6m

#### Boathouse length:-

- Minimum, based on boat length, no clearance
- 8+ - 21m
- 4+ - 13.5m
- 1x - 8m

Hence a boathouse to accommodate a four will also take a scull. To accommodate a four and 2 x 1x requires a minimum of 16m. A boathouse to accommodate an eight will also take one four or two sculls. A boathouse to take an eight and a scull will also take two fours end to end.

Please note that these are absolute minimum internal dimensions, do allow clearance for boat handling.

Source: Amateur Rowing Association:

Developing a Rowing Course for Safer, Better Rowing

## 4.8 SPECIALIST ITEMS: WATER SKIING FACILITIES

### 4.8.1 WATER SKIING: DESIGN GUIDELINES

1 OF 1

Predicted demand and type of user for each site needs to be assessed in consultation with the appropriate sports clubs.

**Size of Water Body:**

650m–1100m length

150m–180m width

For competition and training, containing a slalom course and jumping range.

A safety standard of 6ha per boat is specified by the British Water-ski Federation.

A rectangular/oblong shape is considered most suitable. Recent research has established that large turning areas are no longer necessary as boats can be adequately turned within an 80m diameter, although a turning area may be required where the overall length is less than 650m.

**CABLE TOW:**

This is a new discipline with drag lift and cable to tow skiers around the lake. It can accommodate more people on a smaller area, and is both quieter and cheaper, e.g. requires 360 x 110m for 9–10 skiers

**WATER SKIING RAMPS:**

Ramp size is approximately 7.5m long by 4.25m wide, 6.4–6.7m length out of the water. Ideally the approach and landing needs to be as long as possible. Rough guide approach 300–400m with landing minimum 200m.

**BANKS:**

Backwash can cause considerable problems, therefore, banks should be sloping with 1:6–1:8 gradients, preferably with a reed fringe to absorb backwash. Vertical banks should be avoided at all costs.

**LOCATION/SITING:**

Good wind shelter is required. Earth mounding can provide noise attenuation.

**INFRASTRUCTURE:**

Road access, car parking and boat launching areas (1:8 slope and 3.5–4.5m wide).

**ANCILLARY FACILITIES:**

Clubhouse (or at least changing/toilet facilities). An area for spectator viewing may be required where the water is to be used for competition.



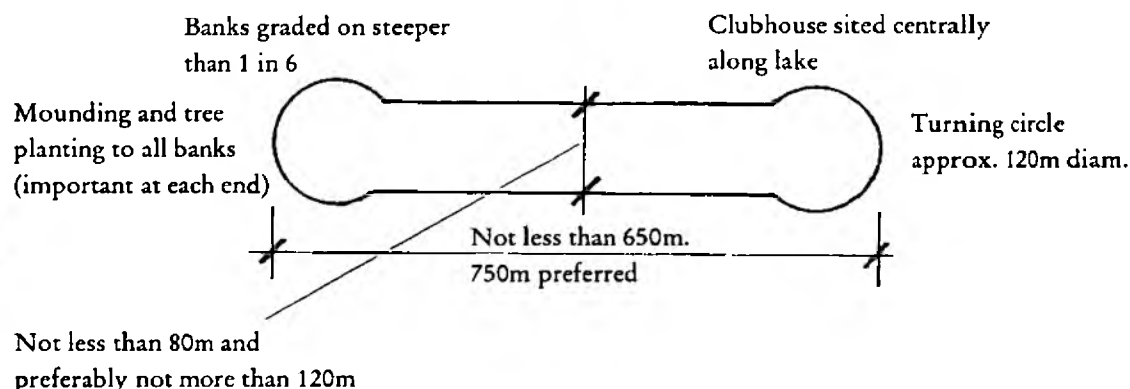
## 4.8 SPECIALIST ITEMS: WATER SKIING FACILITIES

### 4.8.2 WATER SKIING: TECHNICAL INFORMATION

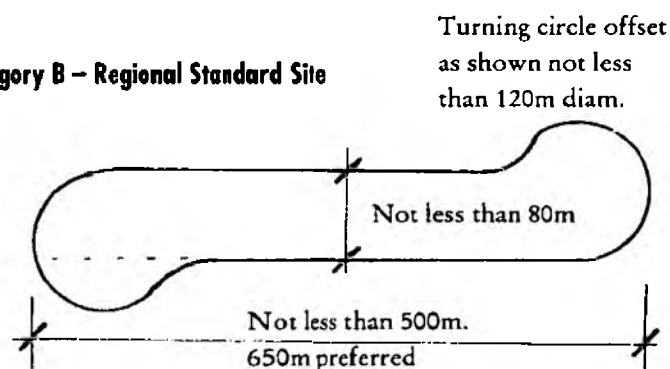
1 OF 1

#### Recommendations for tournament competition water ski sites

##### Category A – National Standard Site



##### Category B – Regional Standard Site



##### Category C – sub regional site

400–500m long and not less than 80m wide to accommodate trick, jump and four buoy slalom courses, but larger areas are required for turning.

##### Category D – recreational skiing site

Recreational skiing can take place on sites 300m long and along the skiing area a width of 50m is safe. Larger areas are, however, preferable and large lakes are better with central islands and several long thin areas of water are better than one large open lake of the same water area.

##### Space zoning on large water areas

Buoyed-off areas on large lakes and reservoirs for the exclusive use of club should ideally be not less than 800m x 200m. Slightly shorter areas may suffice depending on the site.

##### All sites

Should preferably be well sheltered with tall trees and/or mounding up to the waters edge. The ideal minimum depth of water is 2m, although depths of 1.5m are safe.

##### Source:

Eastern Regional Committee of the British Water Skiing Federation (BWSF).

## 4.9 SPECIALIST ITEMS: CANOE FACILITIES

### 4.9.1 SAILING AND WIND SURFING: DESIGN GUIDELINES

1 OF 1

#### SIZE OF WATER BODY:

Variable, no set requirements, even a small waterbody can accommodate windsurfing. Example areas are as follows:

- |                                  |            |
|----------------------------------|------------|
| (i) small boats/training         | 1-5ha      |
| (ii) club sailing                | 6ha+       |
| (iii) open competition           | 20ha+      |
| or                               |            |
| (iv) dinghies                    | 0.8ha/boat |
| (v) small boats<br>eg. optimists | 0.2ha/boat |

#### DEPTH OF WATER:

A depth of 1.5m minimum (deeper where possible) is required for sailing and 0.5-1m for windsurfers although extensive areas at shallow depths should be avoided as they are likely to encourage reed growth.

Large open uninterrupted water area well related to the prevailing wind, with as few indentations as possible. Ideally of a shape to allow for a triangular course, with one side of the triangle parallel to the prevailing wind direction.

#### BANKS:

Open beach ideally on lee shore for instruction.

#### LOCATION/SITING:

Surrounding topography and vegetation should avoid windshadow.

#### INFRASTRUCTURE:

Road access, car park and slipway/boat launching area, (1:8-1:10 gradient) marker buoys. Secure boat park desirable.

#### ANCILLARY FACILITIES:

Changing rooms (essential). Club house (optional but desirable).

#### CONSULTATION:

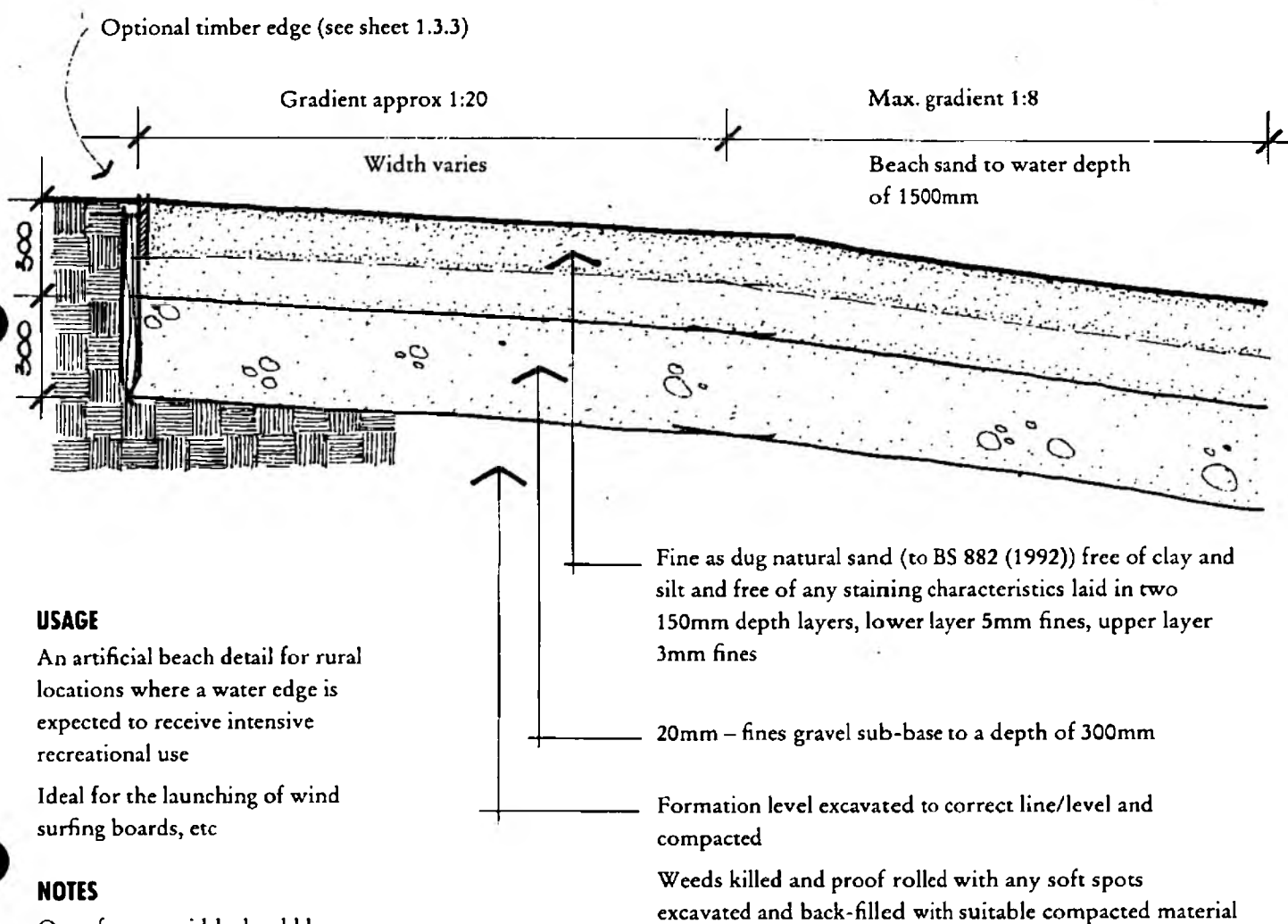
Consult your local sailing or windsurfing club or one of the Governing Bodies who will be able to provide further advice.

## 4.10 SPECIALIST ITEMS: BEACHES

### 4.10.1 BEACH DETAIL

SCALE 1:20 1 OF 1

Source: LUC



#### USAGE

An artificial beach detail for rural locations where a water edge is expected to receive intensive recreational use

Ideal for the launching of wind surfing boards, etc

#### NOTES

Out of water width should be indented to give a more natural appearance

Beach will require occasional raking and rubbish clearance to retain attractive appearance and approximately bi-annual topping-up to retain levels

Refer to: 4.5.1 Proprietary pontoons and jetties

Capital costs	Ease of installation	Durability	Maintenance implications	Sustainability	Access for all	Context
—	+	●	—	+	●	<b>R/S</b>
Low + Medium ● High —	Good + Medium ● Poor —	Good + Medium ● Poor —	Low + Medium ● High —	Good + Medium ● Poor —	Good + Medium ● Poor —	Rural R Semi rural S Urban U

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## PART C

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### REFERENCE INFORMATION

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## REFERENCE INFORMATION

### 1.0 USEFUL ORGANISATIONS

1 OF 4

**Amateur Rowing Association**

The Priory  
6 Lower Mill  
Hammersmith  
London W6 9DJ  
Tel: (081) 748 3632  
Fax: (081) 741 4658

**Brick Development Association**

Woodside House  
Winkfield  
Windsor, Berkshire SL4 2DX  
Tel: (0344) 885651

**British Artist Blacksmiths Association**

Hon. Sec. Brian Russell  
Little Newsham Forge  
Winston, Darlington  
County Durham.  
Tel: (0833) 60547

**British Association of Landscape Industries**

Landscape House  
9 Henry Street  
Keighley, West Yorkshire.  
BD21 3DR  
Tel: (0535) 606139  
Fax: (0535) 610269

**British Cement Association**

Wexham Springs  
Framewood Road  
Slough, SL3 6PL  
Tel: (0753) 662727

**British Canoe Union**

Dudderidge House  
Adbolton Lane  
West Bridgford  
Nottingham NG2 5AS  
Tel: (0602) 821100

**British Field Sports Society**

John Hopkinson  
59 Kennington Road  
London SE1 7PZ  
Tel: (071) 928 4742  
Fax: (071) 620 1401

**British Horse Society**

The British Equestrian Centre  
Stoneleigh  
Kenilworth  
Warwickshire CU8 2LR  
Tel: (0203) 696697

**British Inflatable Boat Owner's Association**

Hatton House  
Leven  
Fife KY8 5QD  
Tel: (0333) 320218

**British Marine Industries Federation**

Meadlake Place  
Thorpe Lea Road  
Egham  
Surrey TW20 8HE  
Tel: (0784) 473377  
Fax: (0784) 439678

**British Precast Concrete Federation**

60 Charles Street  
Lecicester LE1 1FB  
Tel: (0533) 536161

**British Sports Association for the Disabled**

The Mary Glen Haig Suite  
Solecast House  
13 - 27 Brunswick Place  
London N1 9DX  
Tel: (071) 490 4919

**British Standards Institution**

2 Park Street  
London W1A 2BS  
Tel: (071) 629 9000

**British Sub-Aqua Club**

Telford Quay  
Elsmere Port  
South Wirral L65 4FY  
Tel: (051) 357 1951

**British Trust for Conservation Volunteers**

36 St. Mary's Street  
Wallingford, Oxford,  
OX10 0EU  
Tel: (0491) 39766

**British Trust for Ornithology**

The Nunnery  
Nunnery Place  
Thetford, Norfolk  
IP24 2PU  
Tel: (0842) 750050  
Fax: (0842) 750030

**British Water-ski Federation**

390 City Road  
London EC1V 2AQ  
Tel: (071) 833 2855

**British Waterways**

Willow Grange  
Church Road  
Watford WD1 3QA  
Tel: (0923) 226422  
Fax: (0923) 226081

**British Windsurfing Association**

86 Sinah Lane  
Hayling Island  
Hants  
Tel: (0705) 468182

**Broads Authority**

Thomas Harvey House  
18 Colegate  
Norwich NR3 1BQ  
Tel: (0603) 610734

## REFERENCE INFORMATION

### 1.0 USEFUL ORGANISATIONS

2 OF 4

**Building Research Establishment**

Bucknalls Lane  
Garston  
Watford, Hertfordshire  
WD2 7JR  
Tel: (0923) 894040

**Canoe Camping Club**

25 Waverton Road  
South Norwood  
London SE25 4HT

**Central Council for Physical Recreation (CCPR)**

Francis House  
Francis Street  
London SW1P 1DE  
Tel: (071) 828 3163/4  
Fax: (071) 630 8820

**Centre for Accessible Environment**

35 Great Smith Street  
London SW1P 3BJ  
Tel: (071) 222 7980

**Centre on Environment for the Handicapped**

126 Albert Street  
London NW1 7NF

**Circuit Powerboat Racing Association**

7 Shropshire Brook Road  
Armitage  
Staffs WS15 4UZ  
Tel: (0543) 492344

**Civic Trust**

17 Carlton House Terrace  
London SW1Y 4AW  
Tel: (071) 930 0914

**Country Landowners Association**

16 Belgrave Square  
London SW1X 8PQ  
Tel: (071) 235 0511  
Fax: (071) 235 4696

**Countryside Commission**

John Dower House Crescent Place  
Cheltenham, Gloucestershire  
GL50 3RA.  
Tel: (0242) 521381

**Crafts Council**

12 Waterloo Place  
London SW1Y 4AU  
Tel: (071) 930 4811

**Cruising Association**

Ivory House  
St. Katherine Dock  
London E1 9AT  
Tel: (071) 481 0881

**Cyclists Touring Club**

69 Meadrow  
Godalming  
Surrey GU7 3HS  
Tel: 04868 7217

**Department of Education and Science**

Sports and Recreation Division  
Sanctuary Buildings  
Great Smith Street  
Westminster  
London SW1P 3BT  
Tel: (071) 925 5000  
Fax: (071) 925 6000

**Department of the Environment**

2 Marsham Street  
London SW1P 3EB

**Design Council**

28 Haymarket  
London SW1Y 4SU  
Tel: (071) 839 8000  
Fax: (071) 925 2130

**Disabled Living Foundation**

380-384 Harrow Road  
London W9 3HU  
Tel: (071) 289 6111

**Drystone Walling Association**

YFC Centre National Agricultural Centre,  
Kenilworth  
Warwickshire CV8 2LG

**English Tourist Board**

Thames Tower  
Black's Road  
Hammersmith  
London W6 9EL  
Tel: (081) 846 9000

**Fencing Contractor's Association**

St. Jon's House  
23 St. John's Road  
Watford, Herts.  
Tel: (0923) 248895

**Fencing Industry Association Ltd.**

Timbers House  
35 Oakwood Avenue  
Purley  
Surrey CR2 1AR

**Forestry Commission**

231 Corstorphine Road  
Edinburgh EH12 7AT  
Tel: (031) 334 0303

**Forestry Commission Research Station**

Alice Holt Lodge  
Wrecclesham  
Farnham, Surrey GU10 4LH  
Tel: (0420) 22255

**Heritage Coast Forum**

Manchester Metropolitan University  
St Austines  
Lower Chatham Street  
Manchester M15 6BY  
Tel: (061) 247 1067

## REFERENCE INFORMATION

### 1.0 USEFUL ORGANISATIONS

3 OF 4

**HM Coastguard**  
Department of Transport  
Sunley House  
9093 High Holborn  
London WC1V 6LP  
Tel: (071) 405 6911

**Inland Waterways Amenity Advisory Council (IWAAC)**  
36 St. Pauls Square  
Birmingham B3 1QX  
Tel: (021) 212 1333  
Fax: (021) 212 2383

**Inland Waterways Association**  
114 Regents Park Road  
London NW1 8UQ  
Tel: (071) 586 2510  
Fax: (071) 586 2556

**Institution of Civil Engineers**  
107 Great George Street  
London SW1P 3AA  
Tel: (071) 222 7722

**Institution of Leisure and Amenity Management**  
Ham House  
Lower Basildon  
Reading, Berks.  
RG8 9NE  
Tel: (0491) 874222

**The Amateur Rowing Association**  
The Priory  
6 Lower Mall  
London W6 9DJ  
Tel: (081) 748 3632

**The Landscape Institute**  
6/7 Barnard Mews  
London SW11  
Tel: (071) 738 9166  
Fax: (071) 738 9134

**MIND (National Association for Mental Health)**  
22 Harley Street  
London W1N 2ED  
Tel: (071) 637 0741

**National Paving & Kerb Association**  
60 Charles Street  
Leicester LE1 1FB  
Tel: (0533) 536161

**National Playing Fields Association**  
25 Ovington Square  
London SW3 1LQ  
Tel: (071) 584 6445  
Fax: (071) 581 2402

**Partially Sighted Society**  
62 Salusbury Roas  
London NW6 6NS  
Tel: (071) 372 1551

**Personal Watercraft Association**  
Woodside House  
Woodside Road  
Eastleigh  
Hants SO5 4ET

**PHAB**  
(Physically disabled & abled bodied)  
12 - 14 London Road  
Croydon  
Surrey, CR0 2TA  
Tel: (081) 667 9443

**Plas Menai National Watersports Centre**  
Caernarfon  
Gwynedd  
LL55 1UE  
Tel: (0248) 670964

**Port of London Authority**  
Devon House  
58/60 St. Katherine's Way  
London E1 9LB

**RADAR (Royal Association for Disability & Rehabilitation)**  
25 Mortimar Street  
London W1N 8AB  
Tel: (071) 637 5400

**Ramblers Association**  
1-5 Wandsworth Road  
London SW8 2XX  
Tel: (071) 582 6878  
Fax: (071) 587 3799

**Riding for the Disabled Association**  
Avenue R  
National Agricultural Centre  
Kenilworth  
Warks CU8 2LY  
Tel: (0203) 696510

**Royal Institute of Navigation**  
1 Kensington Gate  
London SW7 2AT  
Tel: (071) 589 5021

**Royal Institution of Chartered Surveyors**  
12 Great George Street  
Parliament Square  
London SW1P 3AD  
Tel: (071) 222 7000

**Royal Life Saving Society**  
Mountbatten House  
Studle  
Warwickshire BS0 7NN  
Tel: (0527) 853943

**(RNIB)**  
**Royal National Institute for the Blind**  
224 Great Portland Street  
London W1N 6AA  
Tel: (071) 388 1266

**Royal National Institute for Deaf People**  
105 Cower Street  
London WC1E 6AH  
Tel: (071) 387 8033

**Royal National Lifeboat Institute**  
West Quay Road  
Poole  
Dorset BH15 1HZ  
Tel: (0202) 671133



## REFERENCE INFORMATION

### 1.0 USEFUL ORGANISATIONS

4 OF 4

**Royal Society for the Protection of Birds (RSPB)**  
The Lodge  
Sandy  
Bedfordshire SG19 2DL  
Tel: (0767) 80551

**Royal Society for Mentally Handicapped Children & Adults (MENCAP)**  
123 Golden Lane  
London EC1Y 0RT  
Tel: (071) 454 0454

**Royal Town Planning Institute**  
26 Portland Place  
London W1N 4BE  
Tel: (071) 636 9107

**Royal Yachting Association**  
RYA House  
Romsey Road  
Eastleigh  
Hants. SO5 4YA  
Tel: (0703) 629962

**Salmon and Trout Association**  
Fishmongers Hall  
London Bridge  
EC4R 9EL  
Tel: (071) 283 5838

**Sand and Gravel Association**  
1 Bamber Court  
2 Bramber Road  
London W14 9PB  
Tel: (071) 381 8778

**Sports Council**  
16 Upper Woburn Place  
London WC1H 0QP  
Tel: (071) 388 1277

**Sports Council for Wales**  
Sophia Gardens/Gerddi Sophia  
Cardiff/Caerdydd CF1 9SW  
Tel: (0222) 397571  
Fax: (0222) 222431

**Standing Conference on Countryside Sports**  
The College of Estate Management  
Whiteknights  
Reading  
Berkshire RG6 2AW  
Tel: (0734) 861101

**Stone Federation**  
82 New Cavendish Street  
London W1M 8AD  
Tel: (071) 580 5588

**The Handicapped Anglers Trust**  
South Leigh House  
Gingers Green  
Herstmon Ceux  
East Sussex BN27 4PT  
Tel: (0323) 833139

**The Fieldfare Trust**  
67A The Wicker  
Sheffield S3 8HT  
Tel: (0742) 701668

**The National Federation of Anglers**  
Halliday House  
2 Wilson Street  
Derby. DE1 1PG  
Tel: (0332) 362000

**The National Trust**  
36 Queen Anne's Gate  
London SW1H 9AS  
Tel: (071) 222 5097

**The Angling Foundation**  
Prudential House  
10th Floor  
East Wing  
Wellesley Road  
Croydon, CR0 9XY

**Timber Growers UK Ltd**  
5 Dublin Street  
Lane Street  
Edinburgh EH1 3PX  
Tel: (031) 557 0944

**Timber Research & Development Association (TRADA)**  
Stocking Lane  
Hughenden Valley  
High Wycombe  
Bucks. HP14 4ND  
Tel: (0494) 563091  
Fax: (0494) 565487

**Transport and Road Research Laboratory**  
Department of Transport  
Crowthorne  
Berkshire RG11 6AU  
Tel: (0344) 773131

**UK Board Sailing Association**  
PO Box 36  
Sarisbury Green  
Southampton  
Hants SO3 6SB  
Tel: (0489) 579642

**Welsh Canoeing Association**  
170 Conway Road  
Llandudno Junction  
Gwynedd LL31 9DU  
Tel: (0490) 2786

**Wildfowl and Wetlands Trust**  
Slimbridge, Glos.  
GL2 7BT  
Tel: (045) 389 0333

**Yacht Charter Association**  
60 Silverdale  
New Milton  
Hants BH25 7DE  
Tel: (0425) 619004

**Yacht Harbour Association**  
Hardy House  
Somerset Road  
Kent TN24 8EW  
Tel: (0233) 643837

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### 2.0 BIBLIOGRAPHY

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- British Horse Society. (n.d.):  
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Bridlepaths and Horse-Tracks.*  
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## REFERENCE INFORMATION

### 3.0 GLOSSARY OF TECHNICAL TERMS

1 OF 3

Abutment	support for bridge at either end of span, usually concrete, brick or stone.	Cleat	form of mooring bollard for boats.
Aggregate	broken stone, gravel, sand or similar inert material. See BS.882:1983.	Cloot nail	nail with large flat circular head.
Arisings	material resulting from an excavation.	Coach bolt	a round-headed bolt enlarged under the head to a square section. This enables it to grip the wood without turning as the nut is tightened up.
Arris	sharpened end of rail often to be inserted into mortice.	Code of Practice	or BSCP/CP – publication of Practice British Standards Institution describing good practice in a trade, eg. CP2001 : 1957.
Asphalt	mixture of mineral aggregates of various sizes from powder to coarse sand, with bitumen. Applied hot or cold.	Coping	a brick, stone, or concrete protection, for weathering the top of a wall.
Augered	hole excavated by the use of an auger, a tool for removing a core of soil.	Coxwell gravel	oxidising iron-stone gravel.
Base Course	main load-spreading component of surface providing principal support to the surfacing.	Crib wall	a 3-dimensional lattice of timber or concrete for use as a retaining structure.
Bitmac	abbreviation of Bitumen Macadam.	Crimp	method for fastening two wires together with a wire tie or ring.
Bitumen	mineral pitch, a product of the distillation of oil.	Cross fall	gradient across a paved area to discharge water into a gully.
Bond	laying of bricks or stones regularly in a wall according to recognised pattern for strength.	Desire Line	shortest pedestrian route between A and B, perhaps to be acknowledged with a pedestrian path.
British Standard	or BS – a numbered publication of the British Standard Institution describing the quality or dimensions of a material. The reference number is followed by publication date, eg. BS 1572: 1994	Damp-proof Course	horizontal layer of impervious material laid in wall to exclude water.
Butt joint	joint without mortar where two elements (e.g. slabs) are laid tightly side by side).	Dolly	wooden element used for driving piles.
Camber	convex cross section of road or pavement allowing water to run-off from the centre to the margin.	DoT	Department of Transport
Chippings	aggregate between 3–6mm in size of varying colour used for wearing course of bitmac surfaces.	Driven Post	fence post etc., driven into firm ground, with no foundation.
		Drystone Wall	stone wall without mortar.
		Expansion Joint	or movement joint – joint which accommodates movement in material brick/concrete caused by expansion/contraction.
		Fall/s	gradient on paving to allow run-off of surface water.

## REFERENCE INFORMATION

### 3.0 GLOSSARY OF TECHNICAL TERMS

2 OF 3

Fascines	bundles of brushwood.	Long fall	shallow gradient along a gutter generally leading to a gulley.
Formation	surface of soil/subsoil or fill level in its final form after completion of all preparatory earth works.	Lug	projection on object by which it may be carried or fixed into place.
Foundation	cast insitu concrete base laid below ground level as stable base for wall etc.	Macadam	stones held together in a tarmacadam
Galvanizing	coating of steel with non-ferrous metal by electro-plating process to afford rust protection.	Mortar	cement/sand mixture used for bonding of stone/bricks.
Geotextile	polypropylene separation fabric used to prevent particles of soil infiltrating into aggregate in road/footpath construction.	Mortice	a rectangular slot cut in one (or mortise) timber member into which a tenon from another member is glued or nailed.
Going	horizontal distance between two successive nosings is the going of a tread.	Natural Stone	stone quarried from geological seam.
Gordian clip	method of fastening wire in fencing.	Nosing	overhanging edge to a stair tread.
Granular Fill	quarried granular stone of graded size which compacts to solid mass.	PFA	pulverised fuel ash, a by-product of coal-fired fuel generation.
Gulley	grated opening which receives surface water and feeds it into underground piped system.	Pointing	raking out mortar joints and pressing into them of surface mortar.
Hardwood	wood from deciduous species, eg. oak, or tropical forest species.	Pontoon	Floating mooring facility suitable for varying water levels.
Hoggin	naturally formed combination of sands, gravels and clays.	Pre-cast Concrete	concrete products pre-cast in a mould in factory conditions.
Hurdle	Wattle panel used for fencing.	Pressure	preservation treatment impregnation method for softwood, see BS 4261 : 1985.
In-situ Concrete	concrete laid in-situ.	Proof-rolled	preliminary rolling of formation layer prior to construction.
Jetty	fixed level mooring facility suitable for stable water levels.	Render	application of cement mortar to wall surface.
Jute Blanket	blanket manufactured from jute, or coir for soil erosion control.	Riser	the upright face of a step.
Landing	level interval in flight of steps, ramps, or ramped steps.	Road	fragments of bitmac
Limestone scalpings	fragments of limestone which when compacted form a hard surface.	Planings	stripped off road prior to the surface being resurfaced.
		Sett	cubes of granite used for edges and paving. Usually 100mm square, sometimes rectangular.

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## REFERENCE INFORMATION

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### 3.0 GLOSSARY OF TECHNICAL TERMS

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3 OF 3

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Softwood	wood from a coniferous species eg. Douglas Fir, Western Red Cedar, etc.
Steel Circular Hollow Section	circular mild-steel prefabricated element, hollow in section.
Steel Square Hollow Section	square mild-steel prefabricated element, hollow in section.
Stack bond	laying of slabs, etc. in a grid formation without coursing.
Sub-base	a layer of material between formation level and road base course.
Surface	small sized stone aggregate dressing spread on or in a thin layer of binder over a bitmac surface.
Tarmacadam	combination of road tar and macadam aggregate.
Tread	the level part of a step.
Vernacular	the language of the built environment seen in a particular region, usually governed by its specific natural resources, eg. natural stone, timber, etc.
Waling	timber or metal horizontal member which adds stability to vertical members of retaining wall or campshedding.
Weathering	slight slope on top face of timber post to throw off rain-water.
Weep Hole	small hole in retaining wall to allow discharge of water which may collect in backfill.

## REFERENCE INFORMATION

### 4.0 RELEVANT BRITISH STANDARDS AND CODES OF PRACTICE

1 OF 4

#### 1.0 SURFACES

BS 63:	Part 1: 1987 and Part 2: 1987 Single sized roadstone and chippings.	BS 1881:	1970/1984 Method of testing concrete (this has many parts and some have no relevance in concrete pavements).
BS 76:	1986 Tars for road purposes.	BS 2499:	1973 Hot applied joint sealants for concrete pavements.
BS 434:	1984 Bitumen for road emulsions.	BS 4483:	1985 Steel fabric for the reinforcement of concrete.
BS 435:	1975 Dressed natural stone kerbs, channels, quadrants and setts.	BS 4550:	1970/1978 Methods of testing cement.
BS 497:	1976 Cast manhole covers, road gully gratings and frames for drainage purposes. Part 1: Cast iron and cast steel.	BS 3148:	1980 Methods of testing water for concrete.
BS 594:	1985 Rolled asphalt for roads and other paved areas.	BS 5075:	Part 1: 1982 Concrete mixtures; accelerating, retarding, water reducing (use of admixtures).
BS 1446:	1973 Mastic asphalt (natural rock asphalt fine aggregate) for roads and footways.	BS 5215:	1975 Cold poured joint sealants for concrete pavements.
BS 1447:	1973 Mastic asphalt (limestone fine aggregate) for roads and footways.	BS 5328:	1981 Methods for specifying concrete including ready-mixed concrete.
BS 1984:	1967 Gravel aggregate for surface treatment (including surface dressings) on roads.	BS 6044:	1987 Pavement marking paints.
BS 3690:	Bitumens for building and civil engineering. Part 1: 1982 Bitumens for road purposes. Part 2: 1983 Bitumen mixtures. Part 3: 1983 Bitumen for building and civil engineering.	BS 6367:	1983 Code of Practice for drainage or roofs and paved areas.
BS 4987:	1973 Coated macadams for roads and other paved areas.	BS 6543:	1985 Industrial by-products and waste materials.
BS 5273:	1985 Dense tar surfacing for roads and other paved areas.	BS 368:	1970 Precast concrete flags.
BS 12:	1978 Ordinary and rapid hardening Portland cement.	BS 435:	1975 Dressed natural stone kerbs, channels, quadrants and setts.
BS 146:	Part 2: 1973 Portland blastfurnace cement.	BS 1217:	1986 Cast stone.
BS 812:	1975/1985 Sampling and testing aggregates, sands and fillers.	BS 1286:	1974 Clay tiles for flooring.
BS 882:	1983 Aggregates from natural sources for concrete.	BS 3921:	1985 Clay bricks and blocks.
		BS 340:	1979 Precast concrete kerbs, channels, edgings and quadrants.
		<b>1.7</b>	<b>STEPS AND RAMPS</b>
		BS 5810:	Access for the disabled to buildings. BSI information. Aid for the disabled.

## REFERENCE INFORMATION

### 4.0 RELEVANT BRITISH STANDARDS AND CODES OF PRACTICE

2 OF 4

#### 2.0 STRUCTURES

##### 2.2 WALLS

BS 12:	1978 Ordinary and rapid-hardening Portland cement.
BS 146:	Part 2: Portland blast furnace cement.
BS 743:	Materials for damp-proof courses.
BS 890:	1972 Building limes.
BS 1178:	1982 Milled lead sheet.
BS 1200:	1976 Sands for mortar.
BS 1217:	1986 Cast stone.
BS 1449:	1983 Part 2: Stainless steel strip.
BS 1470:	1987 Aluminium and aluminium alloy strip.
BS 2870:	1980 Rolled copper and copper alloy strip.
BS 2989:	1982 Zinc and Iron – Zinc alloy coated steel strip.
BS 4027:	1980 Sulphate-resisting Portland cement.
BS 4729:	1971 Shapes and dimensions of special bricks.
BS 5642:	1983 Part 2: Coping units.
CP 121:	1973 Part 1: Brick and block masonry.
BS 187:	1978 Calcium silicate bricks.
BS 3921:	1985 Clay bricks and blocks.
BS 4729:	1971 Shapes and dimensions of special bricks.
BS 6073:	1981 Precast concrete masonry units.
BS 1881:	1970 Methods of testing concrete.
BS 4482:	1985 Hard drawn mild steel wire for reinforcing concrete.
BS 4483:	1983 Steel fabric for reinforcing concrete.

BS 5328:	1981 Methods of specifying concrete.
BS 5328:	1981 Ready mixed concrete.
BS 5896:	1989 High tensile steel wire for reinforcing concrete.
BS 6100:	1984 Glossary of terms for concrete and reinforced concrete.
BS 1199:	1976 Sands for external renderings.
BS 4764:	1986 Powder cement paints.
BS 5262:	1976 Code of practice for external rendered finishes.
BS 6213:	1982 Guide to selection of constructional sealants and other appropriate standards listed in previous sections and those defining specific sealant types.
BS 5390:	1976 Code of practice for stone masonry.
BS 6100:	1984 Glossary of terms for stone used in building.

##### 2.3

##### RETAINING WALLS

BS 3921:	1974 Clay bricks and blocks.
BS 5628:	1978 The structural use of masonry: Part 1.
CP 110:	1972 The structural use of concrete.
CP 111:	1970 Structural recommendations for loadbearing walls.
CP 121:	Part 1: 1973 Walling: Brick and block masonry.
BS 187:	Part 2: 1978 Calcium silicate (sand lime and flint lime) bricks.
BS 729:	1971 Hot dip galvanised coatings on iron and steel articles.

## REFERENCE INFORMATION

### 4.0 RELEVANT BRITISH STANDARDS AND CODES OF PRACTICE

3 OF 4

#### 2.4 FENCES – TIMBER

- BS 144/3051: 1972/7 Coal tar creosote for the preservation of timber.
- PA 532: 1980 A paint system comprising an undercoat and gloss finish.
- BS 565: 1972 Glossary of terms relating to timber and woodwork.
- BS 881/589: 1974 Nomenclature of commercial timbers.
- BS 913: 1973 Wood preservation by means of pressure creosoting.
- BS 1201: 1963 Wood screws.
- BS 1202: 1974 Nails.
- BS 1282: 1975 Guide to the choice, use and application of wood preservations.
- BS 1336: 1971 Knotting.
- BS 1722: 1986 Part 4: Cleft Chestnut Pale Fences  
Part 5: Close Boarded Fences  
Part 6: Wooden Palisade Fences  
Part 7: Wooden Post and Rail Fences  
Part 11: Woven Wood and Lap Boarded Panel Fences.
- BS 2015: 1985 Glossary of paint terms.
- BS 2521/2523: 1966 Lead-based priming paints.
- BS 3452/3453: 1962 Waterborne wood preservatives and their application.
- BS 4102: 1986 Steel wire for fences.
- BS 4261: 1985 Glossary of terms relating to timber preservation.
- BS 4471: 1971/73 Dimensions for softwood.
- BS 4765: 1971 Aluminium priming paints for woodwork.
- BS 5056: 1970 Copper naphthenate wood preservatives.
- BS 5082: 1974 Water-thinning priming paints for wood.

- BS 5450: 1977 Sizes of hardwoods and methods of measurement.
- BS 5358: 1976 Low-lead solvent-thinned priming paint for wood.
- BS 5705: 1979/80 Solutions of wood preservatives in organic solvents.
- BS 6150: 1982 Code of practice for painting of buildings.

#### FENCES – METAL

- BS 4: 1980 Part 1: Hot-rolled steel sections.
- BS 405: 1987 Expanded metal (steel).
- BS 481: 1972 Part 2: High tensile steel wire mesh.
- BS 729: 1986 Hot-dip galvanised coatings on iron and steel.
- BS 1052: 1980 Mild steel wire.
- BS 1449: 1983 Steel plate, sheet and strip.
- BS 1474: 1988 Wrought aluminium bars, tubes and sections.
- BS 1485: 1983 Galvanised wire netting.
- BS 1554: 1986 Stainless steel round wire.
- BS 1615: 1987 Anodic oxidation coatings on aluminium.
- BS 1722: Part 1 1986 Chain Link Fences  
Part 2 1989 Rectangular Wire Mesh and Hexagonal Wire Netting Fences.  
Part 3: 1986 Strained Wire Fences.  
Part 8: 1978 Mild Steel (low carbon steel).  
Part 9: 1979 Mild Steel (low carbon steel) Fences with round or square verticals and flat posts and horizontals.  
Part 10: 1990 Anti-intruder Fences in Chain Link and Welded Mesh.  
Part 12: 1990 Steel Palisade Fences.  
Part 13: 1978 Chain Link Fences for Tennis Court Surroundings.



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## REFERENCE INFORMATION

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### 4.0 RELEVANT BRITISH STANDARDS AND CODES OF PRACTICE

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4 OF 4

BS 3830:	1973 Vitreous enamelled steel.
BS 3987:	1974 Anodic oxide coatings on aluminium for external applications.
BS 4102:	1986 Steel wire for fences.
BS 4483:	1985 Steel fabric.
BS 4842:	1984: Storing organic finishes on aluminium.
BS 4848:	1975 Part 2: Hot-rolled hollow steel sections.
BS 4921:	1988 Sheradized coatings on iron and steel.
BS 6323:	1982 Seamless and welded steel tubes.
BS 6722:	1986 Recommendations for metal wire and the standards for paints listed under Timber fencing above.

#### 2.5

#### GATES AND STILES

BS 1186:	1986 Part 1: Specification for timbers.
BS 1227:	1967 Part 1: Hinges for general building purposes.
BS 3470:	1975 Field gates and posts.
BD 4092:	1966 Domestic front entrance gates.
BS 5707:	1979 Stiles, bridle gates and kissing gates.

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## REFERENCE INFORMATION

### 5.0 PRODUCT REFERENCES AND SUPPLIERS

1 OF 3

#### 1.0 SURFACES

##### 1.1 CAR PARKS

- 1.1.2 Plastic Reinforced Grass  
A. Golpla Pavers – FARMURA LTD.  
B. Ritter Grass – UBOPAC LTD.  
C. Geoblock – COOPER CLARKE GROUP PLC.
- 1.1.7 Concrete Block Speed Restrictor  
Rumble strip kerb setts – BDC  
CONCRETE PRODUCTS LTD – MARSHALLS
- 1.1.8 Proprietary Speed Restrictors  
A. Rocol Pacer System – ROCOL SAFETY PRODUCTS  
B. Speedstopper 5–10mph – HAZARD WARNING SYSTEMS LTD.  
C. MT1 – 268 – HAZARD WARNING SYSTEMS LTD.

##### 1.2 FOOTPATHS

- 1.2 Geo-textile membrane – “Terram 1000”  
by EXXON
- 1.2.3 “Coxwell Gravel” by GRUNDON

##### 1.3 EDGING

- 1.3.4 Countryside kerb  
Kerb – MARSHALLS – ECC  
QUARRIES

#### 2.0 STRUCTURES

##### 2.1 BRIDGES

- 2.1.2 Proprietary Kit Bridges  
A. Self Assembly Bridge – C.T.S. LTD.  
B. Standard Kit Bridge – HICKSON  
LEISURE DEVELOPMENTS  
C. Type 1 Ekki Bridge – SARUM  
HARDWOOD STRUCTURES LTD.

##### 2.3 RETAINING WALLS

- 2.3.2 Reinforced Grass  
Proprietary Matting – MMG CIVIL  
ENGINEERING SYSTEMS LTD –  
PHI GROUP
- 2.3.6 Proprietary Timber Crib-Lock Walls  
A. PERMA GROUP (EURO) LTD.  
B. Timbercrib – STARLOCK

#### 3.0 FURNITURE

##### 3.1 SEATING

- 3.1.2 Benches – Metal Mesh  
A. The Volta Range – AMSTAD  
B. Voltan Bench – TOWNSCAPE  
C. UF-3026 6' Low Bench – GAMETIME  
(UK) LTD.
- 3.1.3 Benches – Metal Slats  
Ribbon Series FRB-6 – VICTOR  
STANLEY INC.
- 3.1.4 Benches – Timber  
A. Type 6/2500 – WOODSCAPE LTD.  
B. Type 2/2000 – WOODSCAPE LTD.  
C. Balmoral – HERITAGE TIMBER

## REFERENCE INFORMATION

### 5.0 PRODUCT REFERENCES AND SUPPLIERS

2 OF 3

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|--------|--|------------|--|
| 3.1.5  | <p>Benches – Mixed Media</p> <p>A. Festival Bench – OLLERTON</p> <p>B. Ultram UF – 1000 – GAMETIME (UK) LTD.</p> <p>Howden Bench – TOWNART</p> <p>C. Ultram UF – 1200 – GAMETIME (UK) LTD.</p> <p>D. Citizen Bench – TOWNSCAPE</p> | 3.1.12     | <p>Picnic Tables – Mixed Media</p> <p>Center Post Tables CP-4 – VICTOR STANLEY, INC.</p>   |
| 3.1.6  | <p>Seats – Metal Mesh</p> <p>A. Oll Bench – MACEMAIN ENGINEERING LTD.</p> <p>B. Voltan Mainline – TOWNSCAPE</p> <p>C. The Volta Range – AMSTAD</p> <p>D. Ultram UF – 3006 – GAMETIME (UK) LTD.</p>                                 | <b>3.2</b> | <b>LITTER BINS</b>   |
| 3.1.7  | <p>Seats – Metal Slats</p> <p>Ribbon Series NRB-6 – VICTOR STANLEY, INC</p>  | 3.2.1      | <p>Proprietary Metal Litter Bins</p> <p>A. Hoop Series HB/21 or HB/31 – THE WOODHOUSE COMPANY</p> <p>B. Hoop Series SB11 – THE WOODHOUSE COMPANY</p>   |
| 3.1.8  | <p>Traditional Timber Seat</p> <p>A. Traditional seat – EEC ORCHARD</p> <p>B. Severn – LISTER GEEBRO</p> <p>Braintree – BARLOW TYRIE</p> <p>C. Barfleur – PEART &amp; CO.</p> <p>Mendip – LISTER GEEBRO</p>                        | 3.2.2      | <p>Proprietary Metal Mesh Litter Bins</p> <p>A. Voltan Round Bin – TOWNSCAPE</p> <p>B. Voltan Demi-Bin – TOWNSCAPE</p> <p>C. Abbey Bin RP324 – RECORD</p>  |
| 3.1.9  | <p>Seats – Mixed Media</p> <p>A. Unislat 400 Series UB – 418 – VICTOR STANLEY, INC.</p> <p>B. Ultram UF – 1400 – GAMETIME (UK) LTD.</p> <p>C. Ultram UF – 1500 – GAMETIME (UK) LTD.</p>  | 3.2.3      | <p>Proprietary Metal Slat Litter Bins</p> <p>A. T Series T24 or T32 – VICTOR STANLEY, INC.</p> <p>B. Ironsites S – 35 – VICTOR STANLEY, INC.</p>   |
| 3.1.10 | <p>Picnic Tables – Metal Mesh</p> <p>A. The Voltan Diner (Mini Octavo) – TOWNSCAPE</p> <p>B. (Super Octavo) – TOWNSCAPE</p>  | 3.2.4      | <p>Proprietary Timber Litter Bins</p> <p>A. H Series HF16 or HF316 – VICTOR STANLEY, INC.</p> <p>B. H Series H24 or H324 – VICTOR STANLEY, INC.</p> <p>C. Site Cubes RSC – 2 – VICTOR STANLEY, INC.</p> <p>D. Huntingdon Bin – WICKSTEED</p> |
| 3.1.11 | <p>Picnic Tables – Timber</p> <p>A. Lappset 500 – LAPPSET</p> <p>B. Lappset 501 – LAPPSET</p> <p>C. Bradshaw 493 – CTS</p> <p>Swaledale – LAYCOCK</p> <p>D. Ripponden 491 – CTS</p> <p>Settle Junior – LAYCOCK</p>                 | 3.2.5      | <p>Dog Hygiene Bins</p> <p>A. Doggybin – SWINTEX LTD.</p> <p>B. HG 45P – EARTH ANCHORS LTD.</p>  |

## REFERENCE INFORMATION

### 5.0 PRODUCT REFERENCES AND SUPPLIERS

3 OF 3

#### 3.3 BOLLARDS

- 3.3.1 Timber Bollards  
 A. Bollard SGF – WOODSCAPE LTD.  
 B. Bollard SG – WOODSCAPE LTD.  
 C. Bollard SP – WOODSCAPE LTD.  
 D. Bollard RG – WOODSCAPE LTD.  
 E. Bowden – ECC ORCHARD  
 F. Barmack – ECC ORCAHRD
- 3.3.2 Steel Bollards  
 A. SF351 – THE CAST IRON COMPANY  
 B. SF353 – THE CAST IRON COMPANY  
 C. SF364 – THE CAST IRON COMPANY  
 D. SF304 – THE CAST IRON COMPANY  
 E. No.306 – SUTTON CASTINGS  
 ST118 – THE CAST IRON COMPANY  
 F. Newtown Bollard – TOWNSCAPE  
 G. Gateshead Bollard – TOWNSCAPE
- 3.3.3 Cast Metal Bollards  
 A. No.1094 – SUTTON CASTINGS  
 CI 111 – THE CAST IRON COMPANY  
 No.1521 – DOROTHEA LTD.  
 B. CI 100 – THE CAST IRON COMPANY  
 No.782 – SUTTON CASTINGS  
 C. No.798 – SUTTON CASTINGS  
 CI 104 – THE CAST IRON COMPANY  
 No.1520 – DOROTHEA LTD.  
 Item 100 Pavior – MACHAN ENGINEERING LTD.  
 D. Item 105 Pavior – MACHAN ENGINEERING LTD.

#### 4.3

#### TOILET FACILITIES

Proprietary Toilet Facilities  
 Portaloo – PORTASILO LTD  
 Superloo – PRESÇO BLDGS. LTD.  
 Stone Clad 'Disabled Persons' Autoloo – BRADCO A.V.P. LTD.

#### 4.4

#### FITNESS EQUIPMENT

##### 4.4.1

Proprietary Trim Trail Equipment – CHIPMAN PLAY AND LEISURE  
 EN-TOUT-CAS  
 LAPPSET (U.K.) LTD.

#### 4.5

#### BOATING AND MOORING FACILITIES

##### 4.5.1

Proprietary Pontoons and Jetties  
 A. System 21 – WALCON MARINE LTD.  
 B. Pontoon – SAVACK  
 C. Pontoon – HICKSON LEISURE DEVELOPMENTS  
 D. Jetty – HICKSON LEISURE DEVELOPMENTS

##### 4.5.2

Concrete Slipway  
 Polymer reinforcement grid – NETLON  
 Waterproof polyethylene expansion Fillers – FUSROC EXPANDITE LTD.

##### 4.5.3

Proprietary Mooring Products  
 A. Mooring Cleat – JACK HOLT LTD.  
 B. Mooring Bollards – T. HARRISON CHAPLIN LTD.  
 C. Mooring Cleat – WALCON MARINE LTD.  
 D. Mooring Bollard – WALCON MARINE LTD.

### 4.0 SPECIALIST ITEMS

#### 4.2 BIRD HIDES

- 4.2.2 Bird Hides – GILLEARD BROS.

## REFERENCE INFORMATION

### TRADE REFERENCES

1 OF 2

#### SUPPLIER ADDRESSES

##### Amstad:

Amstad House,  
Cliftonville Road,  
Northampton, NN1 5BU.  
Tel: (0604) 29721 Fax: 29726

BDC Concrete Products Ltd:  
Newport, Gwent, HP9 OWT.  
Tel: (0633) 244181 Fax: 216655

##### Barlow Tyrie:

Braintree, Essex, CM7 7RN.  
Tel: (0376) 322505 Fax: 347052

##### Bradco A.V.P. Limited:

Bradford Metal Works Ltd.,  
Eastwood Street,  
Bradford, W. Yorkshire, BD4 7DH.  
Tel: (0274) 725167

##### The Cast Iron Company:

Ashley House, 18-20 George Street,  
Richmond, Surrey TW9 1HD.  
Tel: (081) 332 7123 Fax: 332 7133

##### Chipman Play & Leisure:

Chipman House, Nightingale Road,  
Horsham, West Sussex, RH12 2NR.  
Tel: (0403) 52221 Fax: 52229

##### Cooper Clarke Group Plc:

Stane Hill Road, Farnworth,  
Bolton, BL4 9NG.  
Tel: (0204) 862222 Fax: 75472

##### CTS Limited:

Concrete & Timber Services Ltd.  
Colne Valley Workshop,  
Manchester Road, Linthwaite,  
Huddersfield HD7 5QG.  
Tel: (0484) 846487 Fax: 847580

##### Dorothea Limited:

Pearl House, Hardwick Street,  
Buxton, Derbyshire, SK17 6DH.  
Tel: (0298) 79121 Fax: 70866

##### Earth Anchors Limited:

Bell Works, R/O 235-243 Bensham  
Lane, Thornton Heath,  
Surrey CR7 7ET.  
Tel: (081) 684 9601 Fax: 684 2230

##### ECC Quarries Limited:

Northernhay House East,  
Northernhay Place,  
Exeter, EX4 3QP.  
Tel: (0392) 52231

##### ECC Orchard:

ECC Building Products Ltd.  
Hulland Ward, Derby, DE6 3ET.  
Tel: (0332) 629291 Fax: 370074

##### En-Tout-Cas:

Thurmaston, Leicester LE4 8EF.  
Tel: (0533) 696181 Fax: 69361

##### Exxon Chemical

Geopolymers Limited:  
Manhilad Park, Pontypool,  
Gwent, NP4 OYR.  
Tel: (0495) 757727/767767

##### Farmura Limited:

Stone Hill, Egerton, Ashford,  
Kent, TN27 9DU.  
Tel: (0233) 76241 Fax: 76419

##### Fusroc Expandite Limited:

Pitfield, Kiln Farm,  
Milton Keynes, MK11 3LX.  
Tel: (0908) 261220

##### Gametime (UK) Limited:

Deppers Bridge, Bishops Itchington,  
Warwickshire CV33 0SZ.  
Tel: (0926) 612105 Fax: 613609

##### Gilleard Bros:

Island Road, Garthorpe,  
nr. Scunthorpe, South Humerside,  
DN17 4AA.  
Tel: (0724) 798344 Fax: 798667

##### Grundon Limited:

Goulds Grove, Wallingford,  
Oxon, OX10 6PY.  
Tel: (0491) 839212 Fax: 832272

##### T. Harrison Chaplin Limited:

Meadhurst Park Nursery,  
Cadbury Road, Sunbury-on-Thames,  
Middlesex, TW16 7LZ.  
Tel: (0932) 783371

##### Hazard Warning Systems Limited:

55-57 Bristol Road,  
Birmingham, B5 7TU.  
Tel: 021 446 4433

##### Heritage Timber:

Waterway Cottage, 10 Dark Lane,  
Whittle le Woods, Chorley,  
Lancashire, PR6 8AE.  
Tel: (0257) 267700 Fax: 267700

##### Hickson Leisure Developments:

New Potters, Grange Road, Goole,  
North Humberside, DN14 6XF.  
Tel: (0405) 766060 Fax: 768622

##### Jack Holt Limited:

30 Lydden Road, Wandsworth,  
London, SW18 4LR.  
Tel: (081) 870 9044

##### Lappset (UK) Limited:

Lappset House, Henson Road,  
Telford Way, Ketting,  
Northamptonshire. NN16 8PX.  
Tel: (0536) 412612 Fax: 521703

##### Laycock Leisure Products:

Broomfield, 102 Granny Hall Lane,  
Brighouse, West Yorkshire, HD6 2JJ.  
Tel: (0484) 715153 Fax: 715153

##### Lister Geebro:

Green Brothers Ltd., Hailsham,  
East Sussex, BN27 3DT.  
Tel: (0323) 840771 Fax: 440109

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 2. *Setaria* L.  
 3. *Pennisetum* L.  
 4. *Eleusine* L.  
 5. *Triticum* L.  
 6. *Secale* L.  
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 8. *Cynodon* L.  
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 10. *Ischaemum* L.  
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 14. *Imperata* L.  
 15. *Themba* L.  
 16. *Pharus* L.  
 17. *Tripsacum* L.  
 18. *Chenopodium* L.  
 19. *Amaranthus* L.  
 20. *Portulaca* L.  
 21. *Malva* L.  
 22. *Rumex* L.  
 23. *Urtica* L.  
 24. *Samolus* L.  
 25. *Lythrum* L.  
 26. *Geranium* L.  
 27. *Antirrhinum* L.  
 28. *Verbena* L.  
 29. *Tradescantia* L.  
 30. *Portulaca* L.  
 31. *Malva* L.  
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 56. *Geranium* L.  
 57. *Antirrhinum* L.  
 58. *Verbena* L.  
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 63. *Urtica* L.  
 64. *Samolus* L.  
 65. *Lythrum* L.  
 66. *Geranium* L.  
 67. *Antirrhinum* L.  
 68. *Verbena* L.  
 69. *Tradescantia* L.  
 70. *Portulaca* L.  
 71. *Malva* L.  
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 211. *Malva* L.  
 212. *Rumex* L.  
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CONFIDENTIAL

1960-1961  
1962-1963  
1964-1965  
1966-1967

1970-1971

The first of these is the fact that the
   

*Journal of the American Medical Association*
  
 has been the most influential of the
   
 medical journals in the United States
   
 since its founding in 1882.

1. *Journal of the American Medical Association*, 1997; 277: 1033-1038.

4. The Commission has been informed that the Government of the Republic of the Philippines has agreed to accept the findings of the Commission and to take the necessary steps to ensure that the Commission's recommendations are implemented.

[illegible]

1. 1990年12月，在江蘇省江浦縣江浦鎮，發現一具古屍，經鑑定為新石器時代的遺骸。

[illegible]

1970-1971. The first year of the study was the most difficult, as the weather was very dry and the water level was low. The second year was the most successful, as the weather was very wet and the water level was high. The third year was the most difficult, as the weather was very dry and the water level was low. The fourth year was the most successful, as the weather was very wet and the water level was high. The fifth year was the most difficult, as the weather was very dry and the water level was low. The sixth year was the most successful, as the weather was very wet and the water level was high. The seventh year was the most difficult, as the weather was very dry and the water level was low. The eighth year was the most successful, as the weather was very wet and the water level was high. The ninth year was the most difficult, as the weather was very dry and the water level was low. The tenth year was the most successful, as the weather was very wet and the water level was high.

ON THE

2. 7.

... ..

1970

$\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{K}^+$ ,  $\text{Na}^+$ ,  $\text{Cl}^-$ ,  $\text{SO}_4^{2-}$

10. 11. 1950

10-11-1964

1. The first step is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

## REFERENCE INFORMATION

### TRADE REFERENCES

2 OF 2

Macemain Engineering Limited:  
54/54 Weir Road,  
Durnsford Industrial Estate,  
Wimbledon, SW19 8UG.  
Tel: (081) 946 1062 Fax: 946 7221

Marshall's:  
Sunderland Road, Sandy,  
Bedfordshire, SG19 1QY.  
Tel: (0767) 681011 Fax: 692455

Machan Engineering Limited:  
103 Broad Street, Denny,  
Stirlingshire, FK6 6EL.  
Tel: (0324) 824309 Fax: 824890

MMG Civil Eng. Systems Limited:  
Vermuydon House, Wiggenhall  
Street, Kings Lynn, Norfolk,  
PE34 3ES.  
Tel: (0553) 85791

Netlon Limited:  
Kelly Street, Mill Hill, Blackburn,  
Lancs. BB2 4PJ.  
Tel: (0254) 262431 Fax: 694302

Ollerton:  
Samlesbury Bottoms, Preston,  
Lancashire, PR5 0RN  
Tel: (025) 4852127 Fax: 485 4383

Peart & Company Limited:  
Beltic Works, Baltic Street,  
Hartlepool.  
Tel: (0429) 26331 Fax: 262179

Perma Group Limited:  
72/74 Bath Road, Cheltenham,  
Glos. GL53 7JT.  
Tel: (0242) 510199 Fax: 222569

Phi Group:  
Greenfx Limited: 72-74 Bath Road,  
Cheltenham, Glos. GL53 7JT.  
Tel: (0242) 510199

Portasilo Limited:  
Huntingdon, York, YO3 9PR.  
Tel: (0904) 624872 Fax: 611760

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Delta Way, Cannock, Staffs.  
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North Yorkshire, YO8 8AG.  
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Rocol House, Swillington, Leeds,  
LS26 8BS.  
Tel: (0532) 866511

Sarum Hardwood Structures Limited:  
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Tel: (0962) 863677 Fax: 842292

Savack Service Limited:  
14 Holton Heath Industrial Estate,  
Holton Heath, Poole,  
Dorset, BH16 6LG  
Tel: (0202) 625250 Fax: 624714

Starlock:  
Star House, Linford Road,  
Chadwell-st-Mary, Grays,  
Essex, RM16 4LR.  
Tel: (0375) 858844 Fax: 840616

Sutton Castings Limited:  
57 Roe Street, Macclesfield,  
Cheshire, SK11 6XD.  
Tel: (0625) 425911 Fax: 613633

Swintex Limited:  
Derby Works, Manchester Road,  
Bury, Manchester, BL9 9NX.  
Tel: (061) 761 4933 Fax: 797 1146

Timbacrib:  
Sharlock, Star House, Linford Road,  
Chadwell, St. Mary's, Grays, Essex.  
Tel: (0375) 858 844

Town Art:  
Hathern Station Works, Normanton-  
on-Soar, Leicestershire, LE12 5EW.  
Tel: (0509) 843745

Townscape Products Limited:  
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Ashfield, Nottinghamshire,  
NG17 2JZ.  
Tel: (0623) 513355 Fax: 440267

Tubopac Limited:  
3 Vale Lodge, Downs Lane,  
Leatherhead, Surrey, KT22 8JQ.  
Tel: (0372) 379605 Fax: 363318

Viictor Stanley, Inc.:  
Distributor CU Phosco  
Great Amwell, Ware,  
Hertfordshire. SG12 9TA.  
Tel: (0920) 462272 Fax: 461370

Walcon Marine Limited:  
Cockerell Close, Segensworth West,  
Fareham, Hampshire, PO15 5SR.  
Tel: (0489) 579977 Fax: 579988

Wicksteed Leisure Limited:  
Digby Street, Kettering,  
Northants, NN16 8YJ.  
Tel: (0536) 517028 Fax: 410633

The Woodhouse Company:  
Spartan Close, Tachbrook Park,  
Warwick, CV34 6RR.  
Tel: (0926) 314313 Fax: 883778

Woodscape Limited:  
Upfield, Pike Lowe, Brinscall,  
Nr. Chorley, Lancashire, PR6 8SP.  
Tel: (0254) 830886 Fax: 831846

Wyretex:  
31 Constitution Street,  
Dundee, DD3 6NL.  
Tel: (0382) 22974