TIMBER DECKING ASSOCIATION

An introduction to creating quality decks

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Timber decking

Timber decking is a relatively new 'lifestyle' concept for the UK - and is set to become a widespread alternative to traditional hard terraces or patios. One of the strongest themes in contemporary landscaping is that of the 'new garden'; whereby the exterior is to be treated as an 'outside room'. In this context, timber decking is an excellent way of extending the living space of a building - outdoors.

Timber decking is highly flexible - and provides extra social space that's ideal for playing with children, dining, entertaining, or just simply relaxing. Whatever the reasons for creating a deck, it's one of the most attractive additions that can be made to a home and public and commercial premises. Compared to the installation of other landscaping structures and surfaces, timber decking brings many benefits - including great aesthetic appeal at a surprisingly attractive price, greater design flexibility or easier installation than some traditional (and non-traditional) alternatives.

The Timber Decking Association (TDA) was formed to provide advice about well-designed, high performance timber decking and to promote excellence in quality of materials and workmanship. This brochure is intended as an introduction to the principles of deck design set out in the Timber Decking Manual which has been produced in collaboration with the Timber Research and Development Association (TRADA). Members of the TDA abide by the guiding principles and standards laid down in the Manual. Architects and designers may obtain a copy of this technical guide by contacting TRADA. Details can be found at the back of this brochure.

DeckMark™ Quality assurance scheme

To provide enhanced confidence in decking materials and construction practices, the TDA has introduced a quality assurance scheme called Deck Mark™. Deck Mark™ is operated by BM TRADA Certification and not only covers materials such as timber components, fixings and finishes but also the installed deck itself where best practice construction methods have been followed. The Deck Mark™ scheme is designed to complement and be additional to any existing quality scheme such as ISO 9000 that may be operated by TDA members.

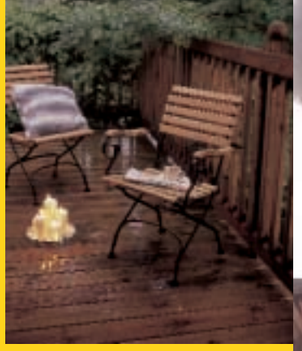
The Deck Mark™ logo (right) is the symbol of a quality scheme designed to ensure that:

- the materials supplied and installed as part of a timber deck are quality products produced to certificated standards
- unambiguous evidence is provided of compliance with the best practice principles specified in the TDA Timber Decking Manual (published by TRADA)
- designers, specifiers, surveyors, regulators and inspection authorities are provided with the means to identify quality materials and installations
- those having decks professionally installed have a certificated assurance of quality

Deck Mark
QUALITY ASSURANCE SCHEME

The Deck Mark™ symbol for quality

Timber: the natural choice



Changes of level and board direction add interest to decking

Timber is a highly flexible material, from both the structural and design point of views. It lends itself superbly to changes in level, direction, texture and shape. It also facilitates deck builds in a number of colours, finishes and architectural styles to complement any building or landscaped area.

Light, yet strong and easily worked timber has many advantages over man made or quarried materials. The need for heavy groundwork and foundations is reduced - if not, in some circumstances, removed entirely. Allied to this is the reduction of the heavy labour associated with brick, stone and concrete installations. Similarly, there is a much lesser requirement for wet working involving concrete, cement or mortar.

The benefits of wood for landscaping structures

- Reduced excavation, foundations and retaining walls. - particularly where ground is sloping or changes in level occur
- Avoidance of wet construction, other than post foundations - making installation quicker and simpler
- Reduced heavy labour, foundation digging, concrete mixing, slab-laying
- Provide for simple changes in level with ramps or steps, and easy addition of features such as balustrades and handrails
- Provides a comfortable surface for walking, sitting or even lying on
- Easily modified or extended
- High aesthetic and natural appeal
- A material in harmony with nature

Timber decking can be adapted to complement any architectural style.

Timbers used for decks

Many species of timber, both softwood and hardwood, are suitable for deck construction. By far the majority of decks in the UK are created from softwoods from the forests of North America, the UK and Scandinavia which have been pressure pre-treated to give long term performance. Modern pressure treatments permanently protect timber used in construction against wood decay and insect attack - even when the component is used in water. It is also possible to have water repellent impregnated at the same time as preservative to give added weather resistance.

Hardwoods tend to be used less than softwoods for ecological and cost reasons.

In harmony with nature

Compared to many other materials found in the garden, wood is an environmentally beneficial choice. The energy consumed - and pollution created - by the harvesting and conversion of timber is far less than other man-made products made from non-renewable raw materials. Efficient use is also made of the by-products of timber processing such as sawdust and chippings.

The Timber Decking Association believes in sustainable development and encourages the use of timber from renewable resources. We support the aims of the Forests Forever campaign by promoting the use of timber from properly managed sources.

Deck design considerations

Some of the factors that need to be considered when planning a deck include:

- Is the site flat or sloping - can changes of level be built in?
- Is the deck site to be in sun, shade or combine elements of both? What is the direction of the prevailing wind?
- Is the deck intended to be a private or a public space? Do trees, boundaries, buildings provide sufficient privacy?
- Will features incorporated into the deck e.g. Balustrades and handrails - interfere with the view?
- Will the location of the deck interfere with services such as drains or manhole covers?
- Is the deck primarily for adults, for entertaining or relaxing, or for family use with a childrens play area?

Having established the project requirements, the next step is to consider the actual aesthetics of the deck and any additional features - such as steps, screens and balustrades - to be incorporated into it. The aesthetics of the deck will largely be suggested by the architecture of its surroundings - timber decking will compliment any style. Alternatively, the decking may be used to re-invent the garden space as a reaction to a building.
Other considerations at this time would be board layout. Boards can laid in any number of ways to influence how the deck is visually perceived, reflecting size and space and segregation of activity areas. Boards are also available smooth or profiled with either ribs or grooves and particular species will also offer variations in colour and grain.

Planning permission

Generally speaking, timber decks - as an addition to an existing property - do not require planning permission. However, the TDA believes it prudent to check and in Conservation Areas, the local planning authority should always be consulted. For new buildings or major refurbishment projects, the TDA recommends that the proposed deck design is included with the planning approval.

Building regulations

Ground or low level decking need not be submitted for approval under Building Regulations. However, if a change in level of more than 600mm occurs in the design , safety precautions - such as handrails and balustrades - should be included. Even then, installing such a rail may not be compulsory - but use of discretionary powers by building control departments varies widely, so it is prudent to check first.In commercial and non-domestic situations, decks may be required to conform to the relevant parts of the Building Regulations relating to fire safety and disabled access. Again, take a view from the relevant building control department.

British and European standards

Currently, no British or European standards specifically address the issues surrounding timber decking. However, many analogous standards are available - such as those concerning the structural use of timber - which may be referred to. Examples taken from the TDA Manual (Published by TRADA) are shown in Appendix 1 of this brochure.

Deck design: the basic principles

Site preparation

The preparation of a site for a timber deck is relatively straight forward consisting largely of setting out and preparing the footings for the support posts. It is also prudent at the design stage to check for any drainage problems in the area where it is planned to build the deck so these may be rectified in advance of installation. Where the deck is of low level design, within 600mm of the ground, the site should be cleared of all vegetation and turf, lightly compacted and graded to 1:40 to enhance drainage away from any adjoining building. Vegetation suppressing black polythene or garden paper should be laid over the deck site (after any foundations have been created) and covered with at least 50mm of gravel.

Construction principles

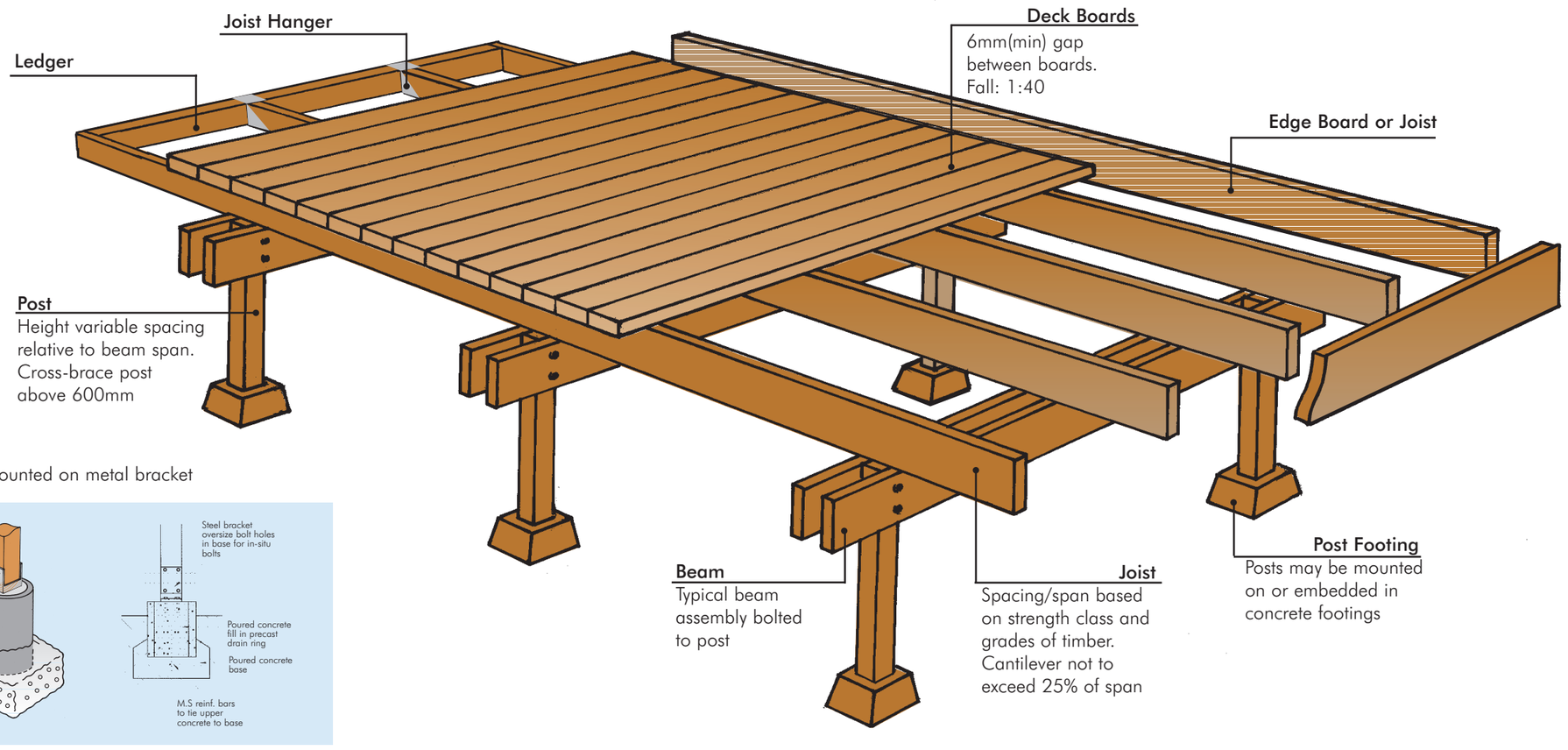
The basic principles of construction are relatively simple. Deck boards of the preferred style are usually fixed to a timber substructure consisting of joists supported on beams which, in turn, are attached to posts mounted on or in concrete.

The spacing of posts will depend on the span of the structure's beams. The size and design of these will be dictated by the loading and stability requirements of the deck. As the deck gets higher, the more crucial this becomes and cross bracing will be needed.

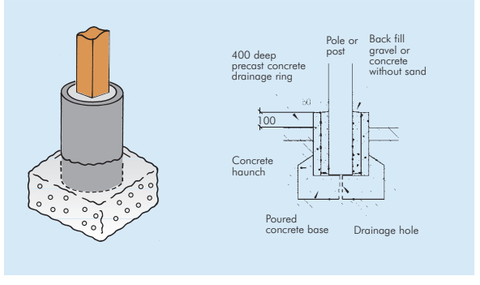
If posts are to be embedded in poured concrete, then it is preferable to use a concrete without a sand aggregate or create a larger hole than usual so that the post can be supported by a dry mix of gravel within a pre-cast support ring such as a drainage pipe. The bottom of the foundation should always be open to allow for drainage. As an alternative, timber posts may be bolted to a proprietary metal bracket fixed to a poured cement footing. Two examples of post foundations are shown in the diagrams below.For ground level decks, precast concrete pads can be used as an alternative to posts and beams to give firm support to the supporting frame. Where the deck is designed to join a building, joists may be supported by a wall plate or ledger board bolted directly to the wall. Any part of the structure that is fixed against a wall, e.g. ledger board or joist, should be secured with a 10mm gap to enable surface water to run away freely. This can be achieved using durable spacer packing or washers attached to the fixing bolts.

One advantage of laying joists over beams is that the deck edge may be cantilevered out over the supporting structure. This is particularly useful on sloping sites to extend useable space or to create the illusion of a floating deck on a flat site. Any cantilever should not exceed 25% of a joist span.

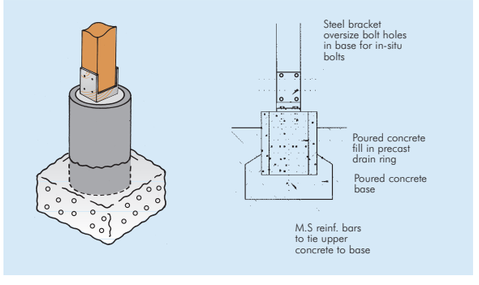
Decking puts a sloping site to attractive use



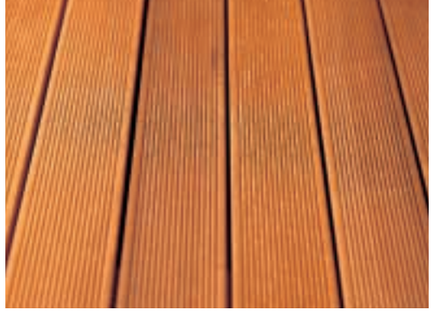
1. Post embedded in precast ring



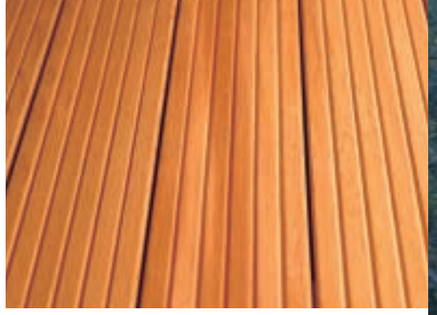
2. Post mounted on metal bracket



Plain



Ribbed

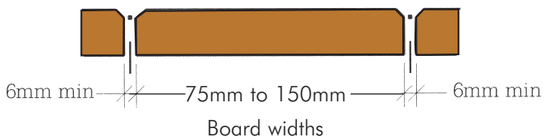


Grooved

The Decked surface

Common sizes of deck board range from 75mm wide to 150mm wide. No matter what type of board surface is preferred - plain, ribbed or grooved - the edges of each board should have a machined chamfer or radius to improve drainage and prevent damage.
Sufficient fall (1:40) should also be built into the deck to enhance drainage of the boarded surface.

A gap of no less than 6mm, and no more than 10mm should be left between boards to allow for movement (wood is a natural material) and to help surface drainage and ventilation through the structure.



Board widths

Good practice tips

Deck design should always seek to maximise airflow around the deck. An accumulation of dead leaves and other forms of rubbish will inhibit ventilation under the deck. Wire mesh or lattice screen between the underside of the deck and ground level will help to prevent this.
When using pressure treated softwoods, all cross cut components should be brushed with an end seal preservative to ensure the integrity of the treatment and maintain any performance warranty.

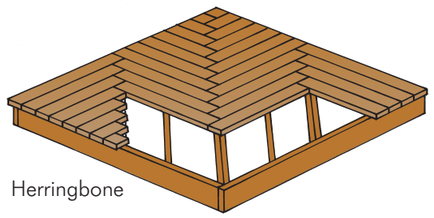
Metal fixings

Galvanised ring shank nails can be used for fixing - although screws, particularly stainless steel, are ideal.Screw size should be twice the thickness of boards and they should be positioned not closer than 25mm to edges or ends, and countersunk.

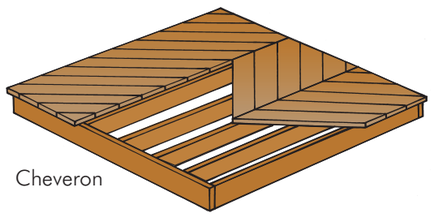
The advantage of screws over nails is that they are more resistant to 'popping' under deck movement; will facilitate removal of boards for maintenance or repair and can be re-tightened if necessary. If bolts, joist hangers or concealed deck clips are used then these too should be of similar rust resistant metal.

Deckboard patterns

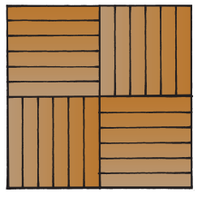
Boards may be laid in a wide variety of arrangements to add visual interest as shown in diagrams below.



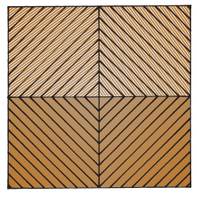
Herringbone



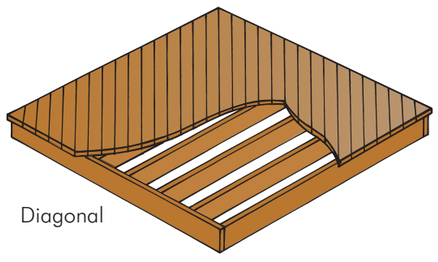
Cheveron



Basketweave



Diamond



Diagonal

Covered first floor balcony deck

Additional features

Additional features include such things as:

- Handrails and balustrades
- Steps and stairs
- Pergolas and trellis
- Planter boxes
- Ponds and pools
- Sandpits

All should be sufficiently robust so as to be able to entertain predicted (and unpredictable) loadings - such as a large party - and should be of the same quality and durability as the deck itself.

Finishes

Staining decks is a highly effective way of decorating and personalising a deck - whether seeking a natural wood shade or fashion colour - and stains can be applied as they would to any natural timber, subject to proprietary advice. For best results use a stain made specially for decking and refresh, every two or three years as recommended by the manufacturer.

Keeping a timber deck looking good

The performance of a deck depends as in all construction on good design and choice of materials including the choice of timber species. Here, members of the TDA can offer the best advice and guidance.

The degree of maintenance required depends on the deck specification. The softwood species of timber used by TDA members requires no further preservative treatment. They will resist decay almost indefinitely and can be expected to last in excess of 25 years. A water repellent coating, may be used to improve deck performance by helping to reduce cracking. If used, water repellents should be applied every other year - preferably at the end of a dry summer. It is now possible to specify decking timbers that include water repellents as part of the pressure pre-treatment process. Decorative stains will also need to be refreshed periodically to maintain their appearance- usually depending on location, amount of sun received and general wear and tear.

Whether smooth faced, grooved or ribbed deckboards are preferred, it is important that the deck surface is kept clean by regular brushing with a stiff bristle brush to remove dirt, algae and dead leaves which could make the deck slippery in the wet. At least once a year - preferably in spring - give decks a more thorough brush or spray cleaning using a proprietary cleaner to lift any stubborn stains.

Deck-care products such as water repellents, stains, deck cleaners, anti-slip coatings and end seal preservatives are all available from within the TDA.

Appendix I British Standards

Analogous standards are given below which may be employed with regard to timber decking.

BS EN 335-1: 1992 Hazard classes of wood and wood based products against biological attack. Part 1 Classification of hazard classes.
BS EN 335-2: 1992 Hazard classes of wood and wood based products against biological attack. Part 2 Guide to the application of hazard classes to solid wood.
BS EN 336: 1995 Structural timber. Coniferous and poplar sizes - permissible deviations.
BS EN 338: 1995 Structural timber. Strength classes.
BS EN 350-1: 1994 Durability of wood and wood based products. Natural durability of solid wood. Part 1 Guide to the principles of testing and classification of natural durability of wood.
BS EN 350-2: 1994 Durability of wood and wood based products. Natural durability of solid wood. Part 2 Guide to the natural durability and treatability of selected wood species of importance in Europe.
BS EN 460: 1994 Durability of wood and wood based products. Natural durability of solid wood. Guide to the durability requirements of wood to be used in hazard classes.
BS EN 599-1 1997 Durability of wood and wood based products. Part 2 Performance of preventative wood preservative.
BS 729: 1971 Specification for hot dip galvanised coatings on iron and steel articles.
BS 1186 - 3: 1990 Timber for and workmanship in joinery. Specification for wood trim and its fixing.
BS 1282: 1975 Guide to the choice, use and application of wood preservatives.
BS EN 1313-1: 1998 Round and sawn timber - permitted deviations and sawn sizes. Part 1 Softwood sawn timber.
BS 4978: 1996 Specification for visual strength grading of softwood.
BS 4072-1: 1987 Wood preservation by means of copper/chromium/arsenic compositions. Specification of preservatives.
BS 4072-2: 1987 Wood preservation by means of copper/chromium/arsenic compositions. Method for timber treatment.
BS 4169: 1988 Specification for manufacture of glued laminated timber structural members.
BS 5268-2: 1996 Structural use of timber. Code of Practice for permissible stress design, materials and workmanship.
BS 5268-5: 1989. Structural use of timber. Code of Practice for preservative treatment of structural timber.
BS 5589: 1989 Code of Practice for preservation of timber.
BS 5756: 1985 Specification for visual strength grading of hardwood.
BS 6105: 1981 Specification for corrosion resistant stainless steel fasteners.
BS 6399-1: 1996 Loading for buildings. Code of Practice for dead and imposed loads.
BS 7359: 1991 Nomenclature of commercial timbers, including sources of supply.
BS 8000-5: 1990 Workmanship on building sites. Code of Practice for carpentry, joinery and general fixings.
NOTE: Components such as joist hangers are not covered by BS or BSEN standards, but may be certified through an independent third party, such as BM TRADA Certification or the British Board of Agrement.

Appendix II

The span tables given below are taken from more comprehensive technical information contained in the TDA Timber Decking Manual (published by TRADA). The example of timbers listed are from strength class C18 or C24 and all carry the visual strength grade SS. The calculations are based on smooth deckboards.

Timber species:	
Strength Class C18	**Strength Class C24**
Western red cedar - imported	European redwood
British grown spruce	British larch
British grown Douglas fir	Douglas fir - imported
British pine	Southern pine - imported

Domestic applications - maximum support centres (mm):

Nominal size (mm)	C18	C24
100 x 25	300	350
150 x 25	400	450
100 x 38	600	600
150 x 38	600	600

Commercial applications - maximum support centres (mm):

Nominal size (mm)	C18	C24
100 x 25	-	-
150 x 25	300	350
100 x 38	450	550
150 x 38	600	600

Timber Decking Manual

Prepared by TRADA Technology for the Timber Decking Association. The Manual has been designed for architects and professional designers as a guide to best practice.

Contact: TRADA, Stocking Lane, Hughenden Valley, High Wycombe, Bucks. HP14 4ND. Telephone: 01494 563091 Fax: 01494 565487
Web site: www.trada.co.uk

Ask the Timber Decking Association

Where the shape, size or styling of timber decking are concerned, practically anything is possible - in so far as budget will allow. However, there will be structural considerations, especially relating to safety - like whether it is to be elevated or how it will cope with any number of people at a summer barbecue or party.

Unless confident of the answers seek advice about such things as structural design and engineering issues, site preparation, finishes, maintenance, and - of course - the installation itself.

The Timber Decking Association is well placed to provide help and advice about high performance decking and quality assured materials through the Deck Mark™ QA scheme. You can find our contact details overleaf.

TIMBER DECKING ASSOCIATION

Further Information:
Timber Decking Association
PO Box 99, A1 Business Park, Pontefract, West Yorkshire WF11 0YY. Tel: 01977 679812 Fax: 01977 671701 Web site: www.tda.org.uk