Landmark

Selecting Timber.

WHAT TO EXPECT FROM YOUR TIMBER PROJECT.
COMMON SPECIES, CHARACTERISTICS & EXAMPLES.

Landmark work throughout the UK and we are consultants and strategists, designers and manufacturers, installers and maintainers. This enables us to have a broad view of what will work effectively while ensuring the end result is sustainable, adaptable and scalable.

This experience has led us to the conclusion that there are three key elements to understand when embarking on a timber project. One, *life in service*, two, *realistic aesthetic expectation* and three, *realistic structural expectations*.

There's a lot to get your head around when working with natural, living materials. It is vital that the materials individual characteristics and behaviours are understood as we delve into your individual project and product needs to find the best fit.

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Please ask for more information around timber certifications

FSC
www.fsc.org
FSC® C117261
The mark of responsible forestry

FSC® certified products available upon request

Material qualities: Considerations

Depending on the project requirements you may have to find a balance between material qualities such as:

COST-EFFECIVENESS

AESTHETIC

WEIGHT

ROT-RESISTANCE

DENSITY

MAINTENANCE

SUSTAINABILITY

DELIVERY & INSTALLATION

Ultimately the characteristics described above will impact the logistical challenges of your selected material.

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Types of timber: Coniferous and deciduous

For the most part hardwood is (you guessed it) harder that softwood, but this isn't always the case. The official distinction is between timber harvested from deciduous trees or alternatively from coniferous trees.

Those that lose their folliage annually and usually feature broad leafs e.g. oak are considered decidious and typically produce hardwood timber.

Timbers sourced from coniferous trees which are evergreen are typicaly needled trees, such as larch and largely produce softwood timber.

Types of timber: Coniferous ('softwood') selection

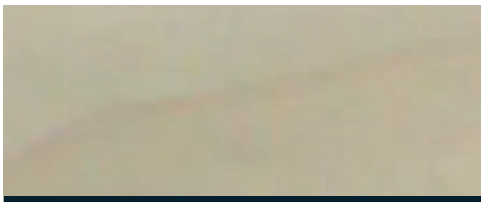
Images show timber as fresh sawn state, not weathered.

DOUGLAS FIR

Colour: Reddish to light brown, a hint of red or yellow.
Grain: Generally straight, or slightly wavy. Medium to coarse, with moderate lustre.
Durability: Moderately to slightly durable, but susceptible to insect attack (wood borers).
Suitable for external use.
Density: 470-520kg/m^3.

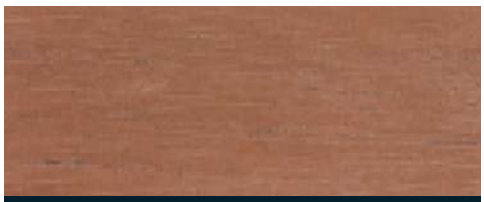
LARCH

Colour: Pale orange/light golden brown, tendency to 'silver-off' over time.
Grain: Straight. Medium to coarse with an oily surface due to its high resin content.
Durability: Moderately to slightly durable, though susceptible to insect attack.
Suitable for external use.
Density: 470-650kg/m^3.



ACCOYA / TRICOYTA

Colour: Yellow to golden or medium brown, with tendency to darken over time.
Grain: Interlocked, medium to coarse texture with open pores.
Durability: Very durable, resistant to both rot and insect attack (wood borers).
Stable in wet conditions.
Density: 510kg/m^3.



WESTERN RED CEDAR

Colour: reddish to pinkish brown, often with random streaks and bands.
Grain: Straight grain with a coarse texture and moderate natural lustre.
Durability: Moderate to high in regard to decay resistance, mixed resistance to insects.
Suitable for external use.
Density: 330-390kg/m^3.

REDWOOD

Colour: Light reddish-brown to yellowish-white.
Grain: Interlocked, and sometimes wavy. Fine uniform texture with a natural lustre.
Durability: Moderate to low decay resistance, and susceptible to insect attack.
Suitable for external use.
Density: 520kg/m^3.

PINE

Colour: Light reddish-brown to yellowish-white.
Grain: Straight. Fine to medium texture.
Durability: moderate to low decay resistance.
Density: 352-849kg/m^3.

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Types of timber: Deciduous ('hardwood') selection

Images show timber as fresh sawn state, not weathered.

OAK

Colour: Light golden brown, with colour tending to 'silver-off' over time (like chesnut).
Grain: Straight, with a coarse, uneven texture with open pores.
Durability: Very durable, resistant to both rot and insect attack (wood borers).
Suitable for external use.
Density: 670-760kg/m^3.

SWEET CHESTNUT

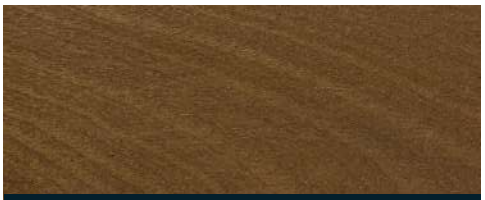
Colour: Light golden brown, with colour tending to 'silver-off' over time (like oak).
Grain: Straight, spiralled or interlocked with a medium to coarse texture and open pores.
Durability: durable to very durable, though susceptible to insect attack.
Suitable for external use.
Density: 540-650kg/m^3.

ASH

Colour: sapwood can be wide and is white, heartwood can be brown.
Grain: Medium to coarse texture with open pores, similar to oak.
Durability: only slightly durable/rot-resistant, non-resistant to insect attack.
Unsuitable for external use.
Density: 560kg/m^3.

GREENHEART

Colour: Usually yellow/olive-brown, sometimes with darker streaks.
Grain: Interlocked, and straight. Fine and even texture with a natural lustre.
Durability: Ranges from moderate to excellent decay resistance. Moderate borer resistance.
Stable in wet conditions.
Density: 1030kg/m^3.

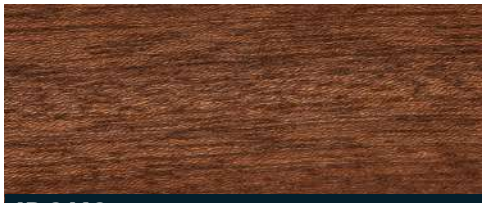


SAPELE

Colour: Dark golden brown, sometimes with a reddish hue. Tends to darken with age.
Grain: Interlocked, and sometimes wavy. Fine uniform texture with a natural lustre.
Durability: Ranges from moderate to excellent decay resistance. Moderate borer resistance.
Stable in wet conditions.
Density: 640kg/m^3.

CUMARU

Colour: Yellow to medium-brown with an orange-pink tint.
Grain: Straight, course texture.
Durability: Excellent durability and weathering properties. Resists insect attack.
Stable in wet conditions.
Density: 1070kg/m^3.



IROKO

Colour: Yellow to golden or medium brown, tendency to darken over time.
Grain: Interlocked, medium to coarse texture with open pores.
Durability: Very durable, resistant to both rot and insect attack (wood borers).
Stable in wet conditions.
Density: 1025kg/m^3.

EKKI

Colour: Dark red to deep, golden brown, . Tends to darken with age.
Grain: Interlocked with a course uneven texture.
Durability: Ranges from moderate to excellent decay resistance. Moderate borer resistance.
Stable in wet conditions.
Density: 960 to 1120kg/m^3.

OPEPE

Colour: White-ish yellow sapwood with orange/yellow heatwood.
Grain: Interlocked, medium texture, waxy.
Durability: Very durable with excellent weathering properties.
Stable in wet conditions.
Density: 740kg/m^3.

Certifications: FSC, PEFC, GiB, what's it all mean?

These 3 certifications all relate to sustainability and traceability, employing systems that rely on a transparent and audited chain of custody. Read on to understand each certification and their differences.

FSC – Forest Stewardship Council
Set up in 1993 and is a global certification system to identify and purchase timber from well-managed and sustainable forests.

It was originally developed to counteract illegal logging of tropical hardwood, and for this reason there are very strict controls for growers and processors.

However, this has had the effect of British growers starting to relinquish their certification, as the demand for British timber has been sufficient to ensure a ready market for uncertified timber.

FSC highlights the following sources of timber as controversial, interestingly this list is then referenced by PEFC (read on):

- Illegally harvested wood
- Wood harvested in violation of traditional and civil rights
- Wood harvested in forests where globally significant conservation values are threatened by management activities
- Wood harvested in forests and converted to plantations or non-forest use
- Wood from forests in which genetically modified trees are planted

PEFC – Programme for the Endorsement of Forest Certification
Set up in 1999 and is similar to FSC, widely used in Europe but not always accepted in the UK as a valid alternative to FSC.

Some consider PEFC does not provide the same level of assurance as FSC certification as FSC operates with five categories of controversial material which must be excluded from FSC operated products. Controlled wood must meet the following basic requirements: 1) The origin of the material must be known and 2) The wood must not come from sources classified as controversial by FSC (see FSC paragraph above).

GiB – Grown in Britain
Set up in 2012 specifically to certify the home grown supply chain so it can compete with imports. Grown in Britain also promotes the sustainable management of our woods for people, wildlife, water and the array of forest products that they provide.

Supply chain leaders such as Forestry Commission and Willmott Dixon etc sit on the board of this not for profit organisation that puts all its surplus into research and development to aid the homegrown sector.

The four key traceability elements for eligible GiB products are:

- UK provenance
- Legally felled
- Virgin timber is sourced from woodlands or forests that are managed to the UK Forestry Standard
- Existence of an effective traceability system for inputs and outputs

Only the Grown in Britain logo provides obvious and visible independent assurance that the timber product comes from sustainably managed UK woodlands.

Landmark are unique in the UK as being the only sign maker to hold both GiB and FSC certification. We love working with this most sustainable of materials and are committed to protecting the world's woodlands for health, wildlife, pleasure and business.

Milling: sawing methods matter

A decision will need to be made as to where a piece of timber may realistically, sustainably and economically be taken from a trunk. **Note:** The method taken to saw timber will contribute to a number of characteristics included in your timber.

It is worth noting that as the timber section increases, cutting options are reduced. If we are prepared to welcome some of the characteristics described in the pages ahead then we create an opportunity to make our projects more characterful, sustainable and economical. This is because selections can be made from larger sections of the butt (felled tree trunk).

Through-and-through Sawing

'Through-and-through sawing' is the UK's favoured sawing method. It may also be refered to as 'plain sawing', 'live sawing' and 'slab sawing'. This is where a log is cut repeatedly into parallel slabs, one next to the other. It is the simplest and most efficient form of log cutting.

The grain and grade of timber will be unpredictable until cut, potentially creating waste if the cuts produce boards with features that some buyers may reject. Other slabs (or perhaps the same slabs depending on client perception) may however be a source of great beauty and are sold as a unique and valuable. This unpredictability means that 'clean cuts' are not guaranteed and can vary considerably in price.

If you are looking for a single, large, one off piece, that is full of variety and character that deepens over time, then this may be the timber for you. These slabs are often utilised to large statement pieces such as monoliths and totems to create a sense of grandeur, especially at site entrances. Often placed in forests and rural areas these pieces reflect the surroundings well, 'blending in while standing out'.

Post Sawing

Posts are particularly helpful when creating exterior furnishings and signage! They are most efficiently milled from the centre of a log, where boards have been taken from the surrounding trunk. This is the heartwood of a tree. Although structurally the most stable part of the timber, some clients like to avoid due to its cracking and splitting nature. With smaller butts there is little choice but to take the heart (and sap) , it takes a very large, very old tree to be able to cut off heart entirely. Most trunks will have a diameter that leads to posts being cut to include at least a portion of the heart, to keep the practice economical.

As we increase our log diameter and decrease the cross-section of our posts it becomes more realistic that we may be able to source off-heart (and sap free) timber and avoid the associated cracks and splits that are not always favoured by our clients (many love them). This however is not common place and may require hunting down from overseas (Europe where possible). This practice also produces more waste. If heart free or sap free timber is something your project requires, please highlight it with our team at the earliest opportunity.

THROUGH-AND-THROUGH

POST SAWING

Treating timber: 5 considerations before you do

Typically Landmark provides unfinished timbers. Taking oak as a case study; it will be left to 'silver-off' and transition to an attractive and traditional silver-grey colour as it is exposed to UV light from the sun. It is possible to treat or even paint fresh-sawn and air-dried oak, but it isnt a decision to be taken lightly. Consider some of the following points before taking action.

1. Timber movement
Movement may cause stress on the layer of finish applied, possibly leading to cracks and flakes.

2. Moisture content
If coated too early this moisture may become trapped, creating an imbalance within the timber leading to issues such as warping and cracking and even peeling of the finish itself. If you are sure you would like to apply a finish then it is best to wait several months (until the moisture content is around 12-15%).

3. Tannins
Tannins will migrate to the surface when timber is freshly cut and may cause discolouration of the finish.

4. Adhesion
The moisture and tannin content of a timber may cause a struggle for finishes to adhere successfully. It is possible for paint to peel and drop off over time. We mitigate this by recommending air-dried timbers where critical information will be engraved and painted as they have a lower moisture content.

5. Clean surfaces
Timber surfaces will need to be free of dust, dirt frost and bark before applying any coatings.

Clear coating
The silver-grey appearance is a natural feature of the timber and is celebrated by many of our clients. It is the desired effect for most remote, woodland projects as it mimics the natural environment in which it is placed.

If however ongoing fade resistance is important to you, then products may be treated with Osmo UV-Protection Oil if required, or if already very faded, with Osmo Wood Reviver Power-Gel to restore the colour. We would always recommend a clear coat, so not to hide the natural qualities of your timber. A common recommendation is to let fresh-sawn timber weather for 3 months, then sand it down and apply the UV protection and a coating.

Joinery grade products such as the Aberdeen display frame and Newbury notice case are oiled as standard.

NATURAL FINISH

OILED FINISH

OILED FRAME ON NATURAL POSTS

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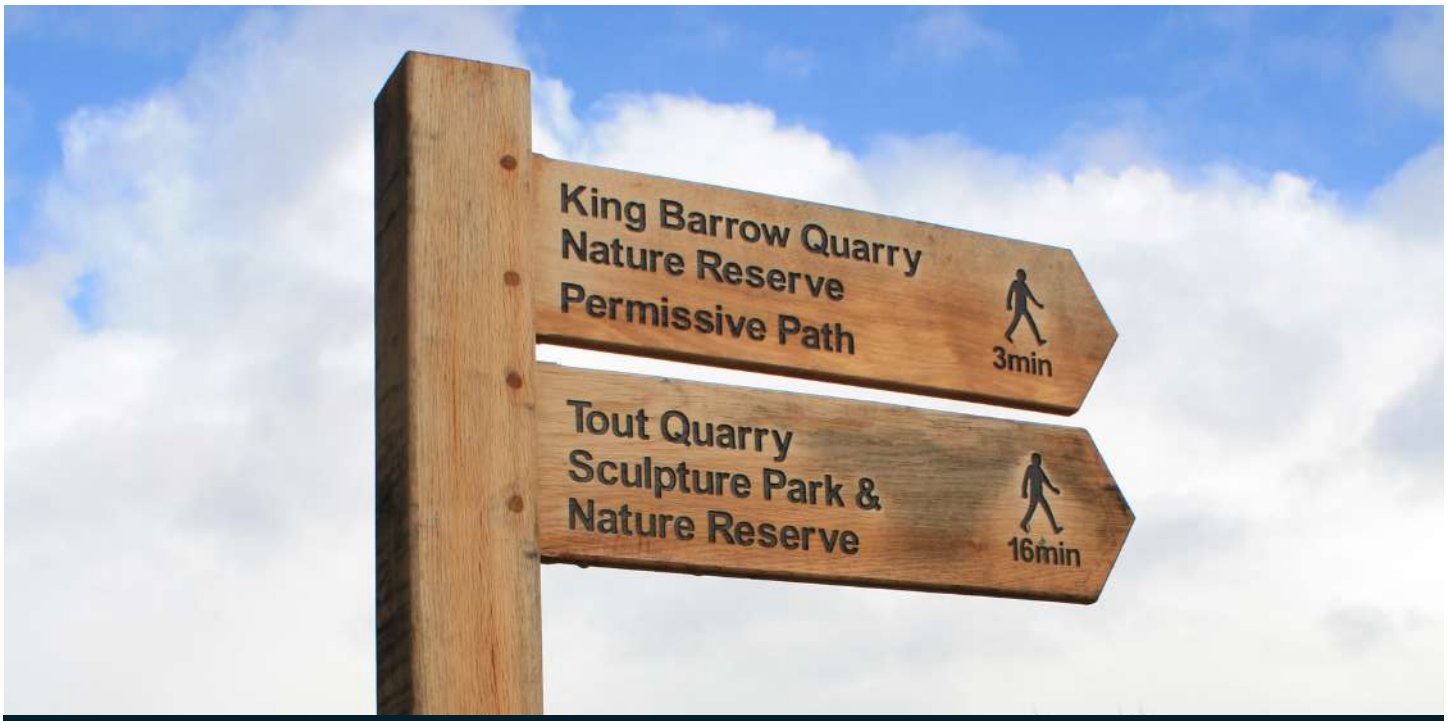
OAK CASE STUDY
Oiled notice case | Natural finish fresh-sawn post | Natural finish fresh sawn fence (+18 Months)

Unfinished timber: Sanding and touch ups

Unfinished products retain the option to give a light sanding anually (when the timber is dry) to help keep products clean and prevent the build-up of dirt and moss. For most rural projects it is important that the product aesthetic blends with its environment and therefore this is not a critical part of their maintenance.

If you do include this in your maintenance plan then the entire surface must be sanded to avoid inconsistent weathering effects on the face of your products as a result of 'sanding bias'. This may also be a good time to touch up any painted engravings (which should be cleaned out and lightliy sanded first).



SANDING BIAS

BEFORE

TOUCH-UP (quaterly)

AFTER SANDING

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Timber characteristics: A case study using OAK

These are tricky to predict inconsistencies that change and develop over time to create individuality and unique personality as only living things do. Perhaps this is one reason why our clients regularly choose timber!

The following pages utilise our most popular material, oak, to remove the veil on common timber traits and industry knowledge.

Choosing to celebrate, include or even tolerate some of the following features in your project goes a long way towards reducing waste, reducing costs and keeping timber products sustainable and keep these practices viable for years to come.

Please ensure that your chosen material is fully appreciated and appropriate for your project. Consult the Landmark team as early as possible about your material expectations. If you find any of the following features undesirable please contact our team to discuss ways around them. We might consider utilising a different species (e.g. using chestnut or Accoya over oak) , critiquing design methods (e.g. putting more prominent features in the ground) or substituting materials with metal or recycled plastic that behaves and performs more constently and predictably.

Characteristics: Shrinkage

Wood typically arrives kiln dried with around a 10% moisture content, or slightly higher when air dried, fresh sawn arrives at somewhere around 35% moisture. Timber may take on more water at the surface level and cause swelling but it is far more likely that your timber will shrink as there will be a net loss of water to the relatively dry environment around it.

This loss of water leads to shrinkage cross sectional dimensions in timber, but not in length. In oak shrinkage tends to be by around 5%. This needs to be taken into account and may require clever design or simple maintenance.

Landmark designers may use this shrinkage to their advantage. We regularly employ mortice and tenon joints to create stable and robust products that stand the test of time. The mortices tighten around the tenons (and dowels) as they shrinks. This is particularly useful when we build items like ladder signs or finger posts where the mortices in our fresh sawn posts shrink onto the tenons of our air dried rungs/fingers, creating a firm joint.

Designers will also include tolerances (usually +3 to +5mm) around any panels that sit inside rebated pockets to flush your artwork with the face of the timber. This simple off-set will avoid any manipulation or crushing of your graphics panels as the timber reduces in size around it.

Air-dried and joinery grade timber may be treated to reduce movement as their water content is already relatively low. This is not the case with fresh sawn timber as it has a high moisture content and therefore needs time to stabilise in its environment before any treatments or finishes can be applied.

When timber items are delivered unassembled it is important that they are put together on site as soon as possible to ensure a good fit. If left too long the mortices may shrink beyond the fit of the tenons.

Protective packaging on your timber product should be removed as soon as possible. The packaging may prevent the timber from breathing resulting in damp conditions that could cause disease or movement.

FLUSH MOUNTED PANELS REQUIRE A + TOLERANCE THAT ALLOWS FOR TIMBER SHRINKAGE

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Hutchinson's Bank
100m
Threecorner Grove
Chapel Bank

Characteristics: Heartwood & sap wood

The fibres in a tree carry water (as sap) and as part of the trees seasonal growth it forms a new ring of outer fibres each year. These outer fibres are the thinner, living section of a tree trunk and is more prone to warping than heartwood (read on). Essentially sap is wetter and on the surface making it more susceptible to quick changes in moisture content and therefore movement.

The inner rings stop carrying sap with each successive outer ring and instead go through a natural preservative process that converts them to heartwood which hardens and provides structure for the tree.

This section of the tree (heartwood) is made up of densely packed fibres that form a tight grain, making it well suited to and widely sought after for many building applications where the product specification calls for strength and durability. Timber sawn closer to the centre of the trunk is more likely to embody or develop splits and cracks which are celebrated by many as what creates individuality in the ir products.

These features can be identified in the majority of timber products that utilise large cross-sections. This is because as cuts become larger it become difficult to avoid heartwood. If these aesthetics are not for you, it may be worth discussing alternative timbers and material with our team.

Sap wood can be avoided in your project by removing it as waste, however as the size requirement of your timber increases so to does the likelihood that sapwood, heartwood and even wane are able to be avoided as they will need to be live sawn to get the most out of the diameter of a tree trunk.

This may also have cost implications as there are fewer pieces available for milling at these sizes per tree. Heartwood can also be avoided in your project by utilising quarter sawn timber but again these may only be available in smaller sections as they are limited by the trunk diameter.

LIVE SAWN TIMBER THAT INCLUDES WANE, KNOTS, SAP

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Characteristics: Cracking and splitting

Watching your products respond to their environment is part of the charm that comes with utilising a living material. Cracking and Splitting is a common and natural occurrence in many timbers (notably oak) and therefore can not be totally prevented. Often timber 'quality' is questioned when these traits appear, particularly where large posts are concerned as they tend to carry heartwood.

As a living product, wood moves and shifts in an attempt to find equilibrium with its environment. This means that whenever there are changes to the environment around your product the timber will seek to match it. At this point splitting and cracking may occur.

As the weather fluctuates you may notice these features changing. When temperatures are high in the summer the timber may to respond to the change in atmospheric moisture and present such features.

Many people make the assumption that their wood had become compromised or damaged in some way and report a defect. In light of what we know about timber reacting to environmental factors we can safely say that there is no need to panic, this is simply not the case. If you take note of how your timber behaves throughout the season you will observe splits and cracks that will appear and then heal.

When the core of the timber contains a higher moister content than the outer sections cracks may become more evident before eventually self healing as the wood finds equilibrium within its own body.

We encourage any our clients that want to avoid these characteristic to stick with post cross-sections no larger than 125mm² (nominal) and to make these traits and expectation when ordering cross-sections 150mm² and above, particularly when ordering our most popular timber, oak.

Timbers such as Accoya or Iroko may be more suited to your project if you are looking for a more constant grain with less surface splitting and cracking. Any cracks or splits that occur should only be looked at for treatment or replacing when the gap exceeds 8mm, causing a risk of finger entrapment .

TIMBER THAT INCLUDES WANE, KNOTS, CRACKS AND SPLITS

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THE NATIONAL FOREST
Welcome to Dolefoot Wood
This woodland is owned by the Duchy of Lancaster
Created with support from the National Forest Company

HATFIELD HOUSE
EXPLORE...
WHERE THE CITY ENDS
& THE COUNTRY BEGINS
WWW.HATFIELD-HOUSE.CO.UK

Characteristics: Wane

Wane is a result of a cut that includes the outer curvature of a log creating a corner or edge that is incomplete. A mill will often have to decide between taking a large timber from the trunk that includes this feature or a smaller piece that doesn't.

Wane will vary greatly from edge to edge and even within the same face. Many people associate wane with the presence of bark on the timber. It's is important to note that as timbers dry and shrink over time, the bark may loosen and fall off of your waney edge.

Wane, like other timber characteristics, can add a certain individual charm to many projects that seek a unique and natural feel that calls back to the materials origins and reflect the environment in which they are situated. This quality is often favoured when producing statement pieces or one-off items.

PLAIN SAWN FINGERS WITH WANEY EDGE, FITTED TO A 'PAR' (PLANED AND ROUNDED) POST

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Car Park
0.5km (10 minutes)

Lily Hill Park

ever-changing
ndscapes

Characteristics: Knots

A healthy living tree will drop dead branches over time which will reveal themselves as knots on the trunks and more prominently in milled timber. Knots are dense areas that can be identified as dark circular patches or spots that interrupt the grain in timbers. The fibres in the living trunk will have navigated around theses patches leaving a beautiful, flowing, wave patterns in our wood.

Some trees have more knots than others. Typically faster growing trees such as spruce have fewer large branches which are cut off to encourage growth and slower growing trees, like oak may include more knots due to the longer time they spend growing large branches as they reach maturity.

It is worth noting that knots may fall into one of two categories, 'Live knots' and 'dead knots'. Live knots are integral parts of the timber as a result of branches that were attached to the tree upon felling. These are considered as acceptable parts of our large structures. Dead knots will have formed as a result of branches that dropped from the tree before felling and can fall out of the timber leaving a hole, these will be avoided where possible but it is not always easy when working with larger lengths of timber. These types of imperfections are best suited to sections of signage, furniture and lighting that will be buried in the ground or set as rear facing.

So, not all knots are bad and they may in fact be favoured as 'perfect imperfections' and areas that create interest. If this isn't the case for your project careful selection and orientation of the timber may be enough to remedy the situation hide such features. It is best to highlight any concerns around knots in timber with the Landmark team looking after your project at the earliest possible opportunity.

LIVE KNOTS ARE INTEGERAL PARTS OF THE TIMBER WHERE BRANCHES USED TO BE

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WELCOME TO THE FINE FOUNDATION
Wild Chesil Centre
Dorset Wildlife Trust
Chesil and Fleet Nature Reserve
CAFÉ
TASTE
CHESIL BEACH
www.tasterestaurant.co.uk
Bird viewing platform
Toilets
Gift shop
Reserve office
Enjoy your visit

Characteristics: Mineral streaks and tannins

Many timbers have a mineral content that will have been absorbed from the soil that the original tree was rooted in. Mineral deposits throughout the tree may become visible on the face of a cut or rise to the surface during the products life in service. They are identifiable as dark grey, black or olive coloured stains that run in streaks and bands which are parallel to the grain. They are often considered to add personality and appeal to the wood as a result. Such markings will be more prominent in lighter timber such as douglas fir and larch but may also be present in darker timbers such as oak.

Tannins (or Quertannic Acid) are the acidic chemicals captured by the sap of a tree. They are present in all species of timber but reside at their highest levels in oak and chestnut. These chemicals actually contribute to a timbers durability and ability to resist insect and fungal attacks, often making oak an ideal candidate for exterior projects, posts will last 10-15 years in the ground if the conditions are right.

They will eventually wash off of the face of most timber products and should not be anything to loose sleep over. The markings will disappear from the wood over time but can be sanded out when dry, or removed with Oxalic acid solution (where safe to do so).

It is worth considering spacing any surface mounted products away from the wall. This will avoid blue-black staining on the wall caused by runoff from rain.

It is also worth noting that tannins will be drawn to regular steel and will corrode the metal as a result. This is why Landmark only uses stainless steel fixings across all relevant products, increasing the life span of your product as well as reducing the need more maintenance of items from our timber range.

The high tannin (and moisture) content in fresh-sawn oak, may present challenges if you are hoping to apply a finish or paint to your product as many finishes struggle to adhere properly to the surface as a result of these properties. This includes paint which may peel or chip off over time. We recommend upgrading to air-dried timber where possible on products such as fingerposts and laddersigns that contain critical information engraved with a painted finish.

DARK COLOURED STAINS AS A RESULT OF HEALTHY MINERAL WASH OUT.

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Welcome to
Hesworth Common
Notices

THAMES21
Thames Water

Stay safe
and stay
wild!
Essex
Wildlife Trust

Characteristics: Silvering off and UV

When left exposed to the elements seasoned timber will inevitably weather. Colour change will be evident in these situations and is due to the photo degeneration that occurs as a result of UV (ultraviolet) light exposure from the sun, algae growth and natural oxidisation.

The changes may be less obvious in more naturally durable timbers with a higher resin content such as larch or cedar. It is not unlike the process for cor-ten steel which reacts with its environment and form an oxide layer changing its appearance from a metallic grey to a rusty orange.

In oak the initial deep golden colour will begin to embody a more yellow/brown tone which will eventually silver off to a soft-grey. The grey is a result of sun damaged polymer bonds such as cellulose and lignin leaching out of the wood onto the surface of the product.

Where an authentic look is desirable, this 'silvering off' it will help the product to match and reflect the natural surroundings in which it sits.

COLOUR UPON DELIVERY

COLOUR /CONDITION AFTER 3 YEARS SERVICE

DARK COLOURED STAINS AS A RESULT OF HEALTHY MINERL WASH OUT.

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Landmark

Castle
Learning
Centre

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