



**Fallen trees
as climbing
structures in
playgrounds**

Londonplay 

Fallen trees as climbing structures

“Climbing trees and falling out of them is all part of growing up and having small injuries helps children learn about risks. We take the view that it’s a good thing to try to equip children and young people and help them make informed decisions about the risks that they take. We would prefer children to climb trees in playgrounds rather than building sites, factories and other potentially dangerous locations.”

(Royal Society for the Prevention of Accidents)

When exploring or playing children particularly like to chance upon logs and trees which give opportunities for balancing, scrambling, climbing and for imaginative play. They also provide a focus just to sit and talk. This note is therefore designed to address some of the issues relating to the use of trees and logs in playgrounds.

An important safety consideration is one of reasonable expectation by members of the public. If people take their children into a wood or onto common land and find a fallen tree or indeed use a natural tree there is not any reasonable expectation that it will have been checked for safety. They will know that it may break or collapse unexpectedly and so they will tend to be cautious in its use.

On the other hand if people go to a specifically designated play area, picnic area or similar they will have a reasonable expectation that anything provided will have been checked for safety and will not be liable to sudden collapse or breakage. They are therefore much more likely to use it with a surprising degree of disregard for the possibility of unexpected occurrence.

Using old fallen trees is not as simple a matter as might be thought at first sight. Each tree is individual and therefore does not come to a standard design which has been tested over the years. In addition, laying it on the ground will mean that forces exerted on it and the way it will be used will differ from a growing tree in a natural environment. Furthermore, because it has been cut down it will clearly rot more quickly than would have been the case if it had been a growing tree.



Where to get trees

Tree types

Trees could be local wind fallen specimens in situ, or a new use for trees felled locally, or sourced and felled specifically for a playground. The range of potential tree shapes and sizes and log dimensions are endless, generally over 450-500mm diameter trunks minimum, and anticipate removing any branches below 200-300mm diameter, depending on length and leverage they exert.

Sourcing

Contact your local arboriculturist , tree surgeon, woodsmen or forester.

See links at the end of this document for good sources for starters.

NB: *Be careful not to fell important, veteran or TPO (Tree Preservation Order) trees.*

Trees shouldn't cost a lot to get hold of; timber in this form is cheap; the labour in preparing and moving them is the most expensive part of the work.

Species

There are so many trees which could become available for climbing structures it is impossible to list them all. However most native hardwood species should be suitable: Oak, Beech, Alder, these will last longer than soft wood trees, such as Pine, Ash etc. Species which will rot really fast should be avoided, Birch, Poplar, Willow, Larch. Non natives such as Cedar, Pine, Redwood, Plane, Acacia, Robinia, Yew etc could be great, do some research into the properties of each timber.

NB: *Check out www.trada.co.uk, (timber research and development agency)*

Age

Seasoned timber is much harder than recently cut, green timber. Sea washed timbers can be really good as they will be hardened by sea salts and battered by the sea. The girth of the timber is important as this gives a solid climbing structure which will last.

Things to look for

The most important thing is a good shape for the purpose intended, an interesting open network of branches for climbing. The structure of the tree will dictate the climbing frame created, careful measuring, visualisation and marking of the tree before you fell or move it to site is important. The portion of the tree where the trunk splits to form branches is best. Fungus is important to spot as severe rot or fungus could destroy the timber quickly.

Dead or alive

Trees can be fallen or standing dead wood. Whole living trees can be moved with their root systems intact and laid down like a big cutting. Species which may be good for living tree features are Willow, Plane, Chestnut, and there are doubtless many more. (Species which are known to shed their branches, Robinia, Horse Chestnut, Beech, and Sugar Maple may not be suitable

NB: *Please note dead wood and trees are valuable ecological habitat for birds, mammals and invertebrates, please take care not to remove any trees which may house protected species, or form part of a viable ecosystem which will not recover from this loss i.e. take trees from an abundant source.*

Moving large trees

This can be the most complex part of the whole operation; suitable trees can be difficult to get to and will be tonnes in weight. The operation of preparing and lifting the trees for moving into position must be carefully thought through and operated safely by experienced handlers.

NB: This section of the works will require thorough risk assessment prior to operations on site under CDM regulations.

NB: The tree can only be as wide as the vehicle you are moving it on, and as heavy as the lift will allow i.e. approx 3 tonnes, 7m length, 2.7m width and 3m height. As a guide, however each case could differ greatly with access or machinery available.



Ideas for added play value

Climbing holds

Simple plastic climbing holds, steps cut with a saw or timber pegs etc can be added to unclimbable sections of tree or timber to make them more accessible or fun.

Nets or ropes

These can be attached to add additional routes onto the structure, and could aid stability if placed symmetrically.

NB: Do remember that this may give opportunity for a large number of children to apply weight to a single point which then may apply excessive leverage and break.

Routes

Having lots of ways to get around up, down and through the branch structure, under the trunk, onto other structures can make the whole thing more fun. Challenging routes are really good and give longer lasting play value, but all sizes of children and young people should be considered.

Shaping carving and sculpting

Endless fun ideas could be built into these structures, carving patterns, games, words, steps, faces, ladders, spy holes etc.



Safety

If a log is laid on a playground and none of its parts from which a child could hang or swing is above 1m then there are unlikely to be many safety considerations. This sort of log children will use for sitting on, balancing and scrambling over. It will be necessary to make this secure so it can't be rolled onto a child's foot or into a position which may make it a fall hazard.

When a tree is bought it cannot be easily predicted what it will be like when it is laid on the ground in a playground. For a start no-one will be sure on which side it will be laid which gives countless possibilities (both advantages and disadvantages). It is also likely that what may appear to be a good branch may break in the process of felling or of transporting the tree or it may be found that what appears to be a strong branch has severe rot or cracking which means it needs to be cut off.

Hazards:

- wedge traps into which a child might slip, particularly if these might trap the neck;
- sharp points or projections onto which a child might fall thus causing a puncture wound;
- sharp edges or splinters which may cause cuts;
- branches which are unlikely to take the weight of 2 or 3 large children swinging on them;
- branches which lead to a high fall height over something which is hard or which is likely to act as a fulcrum or projection if it is fallen on.

Having identified these sorts of hazards the tree can therefore be modified, secured, or re-orientated to reduce the hazards.

Any further measures to try to achieve absolute conformity with EN 1176 would usually not be "reasonably practicable" (Health & Safety At Work Act) or would detract from the attractiveness and "natural" feel of the playground. The recommendations below should not be interpreted as a cause for alarm but merely as an aid to common-sense measures to take during usual inspection procedures.

Stability, short and long term

Careful checking for movement of trees and logs is of paramount importance; be sure that children hanging on extremities can't cause the log or tree to roll. Using other logs, or earth mounding to shore up the tree to prevent movement should be sufficient.

NB: *Cut long protruding branches shorter if they could create leverage or movement*

NB: *Long term stability must be monitored as the tree ages and checked regularly to prevent any kind subsidence or collapse. In addition, should children attach ropes to these trees then these should be removed as they may create forces which have not been anticipated at the design or Post Installation stages.*



The inspectors should also look out for any cracking at the base of branches or any increasing movement when they apply force and weight. Branches will obviously have some flex and this is to be expected and should not be worrying. However it is when this movement increases that they need to be concerned.

The inspectors should also look for any signs of instability either because some groups of children have found a way of moving the log or because of rot or settlement the item starts to move.

Traps

Timber will have splits and shakes, cracks and crevices, which need to be examined carefully prior to commissioning. These could pose finger, hand or toggle traps, provision must be made to reduce this as much as possible, in timber selection and preparation. Seek inspector advice regarding specific examples.

Moss/rot and change

It is important to understand that fallen trees will rot and decompose over a period of time, this is a natural process and must be monitored for safety. Choose timber which is free of rot before you install it will help.

Check trees for excessive rot regularly (knocking with a rubber hammer to hear for hollow sounds or poking with a stout screwdriver), and removing portions of deteriorated timber.

NB: *Removing bark will help the air to harden the timber and reduce the amount of damp trapped in the wood.*

Where the timber comes into contact with the ground will be most susceptible to rot, so minimising ground contact or placing the log on feet or legs or stone will help it last.

Because the wood has not been cut into planks or similar it is possible there are imperfections or weaknesses which are not obvious. During the operational (usually quarterly) inspections the inspector should have a stout screwdriver or similar and poke and prod the wood to see if any rot can be detected. Particular attention should be paid to the base of any branches from which children might hang or use for support.



**Safety surfaces
could be:**

**Grass, suitable for
fall heights of 1m and
up to 1.5m where the
grass is good**

**Rubber grid matting
over grass surface**

**Play grade sand or
rounded pea gravel**

**Play bark, or rubber
crumb**

Poured rubber

Fall issues

The Standard should be applied for falling space issues of trees as climbing structures:

- Falling areas clear of projections or hazards
- Impact absorbing surfaces underneath

As with all commercially available play equipment, for fall heights

- under 600mm - no safety surface is needed
- over 600mm – 3m impact absorbing surface tested to EN 1176

NB: *A clause in EN1176 states that fall heights of 1m grass is suitable and in Britain up to 1.5m where the grass is maintained as a good grass sward throughout the year, with good root structure and checks of substructure.*

NB: *Logs over water require additional guidance not covered here.*

Please seek specialist advice from a suitable safety inspector.

Finish/splinters - How rough is too rough?

This is a subjective one as trees and timbers vary greatly, some roughness is good for grip, and the whole point of using trees is their natural surface.

However as a rule:

- Remove projections, pegs, twigs, spikes or burrs which could injure
- Run your hands over the surfaces to feel for excessive roughness or sharpness, and smooth where necessary.

NB: *We have used a chainsaw disk which fits an angle grinder for this task as it is very quick and efficient.*

Bark, splinters and loose bits

Bark can be removed prior to leaving the tree in situ as it will fall off in time, this does depend on the species, age, location and state of the tree used.

Bark on the trees will, over time, often detach and it is possible that there might be sharp points or protrusions which are revealed. Where this is the case they should be removed and smoothed.

Splinters will depend on the species of tree used, oak can be pretty bad.

Loose bits of wood should be removed if they pose a danger; if they can be left they can provide a great source of play material.

Sandblasting can remove a lot of debris quickly and get back down to the hard wood, although it can be expensive.

NB: *Careful species and specimen choice can make the most difference here.*



Maintenance, routine operational checks

In addition to the regular visual checks, staff who carry out the operational (usually quarterly) inspections (as in EN 1176) should be trained to:

- Check for rot and change
- Check stability
- Check strength of limbs
- Check surfaces for cracking, splinter dangers etc
- Keep note of any issues or reports of issues from users or staff

The tree should have been assessed as “fit for use” at the time of the Post Installation Inspection.

Post Installation Inspections will include poking and prodding as well as applying force and weight and traversing the item in ways which the inspector anticipates the children will use it. Where any weaknesses or potential weaknesses have been identified then appropriate parts will have been trimmed or cut off altogether. In some cases additional measures will have been taken to secure the logs to the ground.

NB: *It is an important point that site management accept responsibility for their own risk & benefit assessment.*

Slippery when wet

Timber can be a slippery surface when wet or icy, roughing smooth surfaces with a chainsaw may help. Be aware that this can cause water or ice to collect also.

Animals and wasps

As a living habitat for creatures, wasps, bees, ants and many other insects could make their home in the dead tree. Provided they don't pose a threat this should be viewed as a benefit of using a natural material. Nesting wasps or bees should be treated as they would if they set up home in any other tree in a playground setting.

Dos and don'ts

Do seek advice from arboriculturists or timber specialists on species

Do test and check the tree very thoroughly at every stage of the process, including a ROSPA or CAPT inspection

Don't forget to check it routinely for change in strength or stability

Don't leave fall heights of over 3m

Do use appropriate safety surfacing on any fall over 600mm

(grass may be suitable up to 1.5m provided it's not over compacted)

Do check all branches for signs of cracking with age

Don't use small trees which won't take weight and will rot quickly

Case studies

Ufford St; Waterloo Oak tree

This was a standing dead oak tree taken from a line of oaks killed when a ditch flooded.

The tree was felled and sand-blasted in situ before transportation to site. It was lifted with a Hiab lift on a flat bed transporter and moved to site where it was positioned on hardwood sleeper pads.

Surfaces were then smoothed, pegs removed, thin branches shortened and steps cut in. Rubber reinforced grass surface was built in around it.



Elm Village; Camden Oak tree

This fallen oak has been built into a larger play structure, and had steps cut in.

The bark has been left on and this substantial tree will last for many years.



Cantelowes Gardens; Camden

These Sycamores have been left as simply as possible, with bark on and some twigs still attached.



Credits and contacts

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Tree moving

- Highwood tree services; Dave Ellis Chichester, 077979797
- Ruskins Trees & Landscapes Ltd, Essex, 01277 849990
- Civic trees Ltd 079769660

Timber supply

- www.Woodnet.org & www.trada.co.uk
- (London & SE Area) Gristwood and Toms Ltd, tel. 08458 731 500
www.gristwoodandtoms.co.uk
- Ruskins Trees & Landscapes Ltd, Essex, 01277 849990

References

“Talking about play” Akehurst A, Whewey R 1982 pub HPFA 2nd ed pub NPFA - found children value “natural” play

