

WPA Field Trial of Preservative Treated British Softwoods Year 5 Observations

Background

The WPA field trial was established in 2015 to create a robust and independent test of the performance of preservative treated fence posts. The aims of the project are:

- To gain valuable input in to the future development of BS 8417: Preservation of Wood Code of Practice and the WPA Industrial Wood Preservation Manual
- To support the WPA Benchmark quality approval schemes for treated wood
- To build lasting confidence in preservative treated British softwood species in this application as a capable, reliable and quality product



The Test Criteria

In 2015, under contract from WPA, the Building Research Establishment and our industry sponsor group collaborated to manufacture, treat and install 1360 fence posts and 300 EN252 stakes across two field test sites, one at BRE Garston, Watford, England and one at Birnie Wood, Elgin, Scotland.



Elgin, Scotland

The Posts

There are 600 treated posts and 80 untreated posts at each test site. All are sawn posts that are 75 x 75 mm and approximately 1m long. The above ground cut end of each post was effectively capped to protect the untreated end grain.

The Stakes

In addition, at each site, pine sapwood EN252 stakes (25 x 50 x 500mm) untreated and treated with a reference wood preservative as an internal reference control were installed, along with EN252 stakes of untreated Sitka spruce, Douglas fir, larch and pine heartwood. These stakes provide vital information on:

- The characterisation of the biological hazard at the field sites
- Natural durability data on contemporary commercial materials in an accelerated ground contact field test

Year 5 Inspection Results Summary

The performance assessment of the timber in the field trial after 5 years in ground contact has shown **significant failure of untreated EN252 stakes and untreated fence posts at both the BRE Garston and the Birnie Wood sites.**

The inspections of **preservative treated fence posts show no significant signs of change or deterioration.**

The fact that no significant signs of deterioration are observed after five years of exposure of un-incised, treated Sitka spruce (KD) and treated larch and Douglas fir posts ensures confidence that all the other preservative treated material will be performing better. The partial assessment of the ground contact field trial is also showing differences between the two field test sites.



Below ground section of treated spruce fence post at Garston, Watford showing sound wood below groundline. Note waterlogged hole.



Below ground section of treated spruce fence post at Birnie Wood, Elgin showing sound wood.

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Year 5 Observations

Site Differences

Garston, England

- All the EN252 stakes are showing signs of deterioration and decay below ground with 21 stakes failing in service at this inspection.
- All the untreated posts are showing signs of deterioration below ground with 19 posts failing in service at this inspection.
- The un-incised, treated Sitka spruce (KD) fence posts are showing no significant signs of deterioration after 5 years exposure.

Birnie Wood, Scotland

- All the EN252 stakes are showing signs of deterioration and decay below ground with 15 stakes failing in service at this inspection.
- All the untreated posts are showing signs of deterioration below ground with 14 posts failing in service at this inspection.
- The un-incised, treated Sitka spruce (KD) fence posts are showing no sign or slight signs of deterioration after 5 years exposure.

Early Conclusions

At this relatively early stage we can begin to draw some initial conclusions which may have longer term commercial significance

<p>1. All treated posts are still performing well after 5 years' service in two very different sets of ground conditions.</p>	<p>This clearly contradicts the anecdotal 'conclusions' being drawn by some in the fencing sector, following the widespread switch from CCA to Copper Organic preservatives 10-12 years ago, that early failures of posts after 3-4 years were simply due to the inferior performance of the new preservatives. Clearly there must have been other factors involved.</p>
<p>2. The Larch and Douglas Fir heartwood EN 252 stakes are clearly performing better than the pine or spruce at Garston, as might be expected. However, that is not the case at Birnie wood.</p>	<p>This suggests that the ground conditions may make a very significant difference to the performance of untreated D.Fir in particular. The dominant decay organisms are linked to the ground conditions, with some preferring wet clay soils (Garston) and others more free draining conditions (Birnie Wood).</p>
<p>3. At the time that materials were being prepared for this project, Larch and Douglas fir posts specified as 'heartwood' were selected to contain at least 80% heartwood, measured by cross sectional area. Pine posts were selected to contain at least 50% heartwood, to better reflect commercially available stock.</p>	<p>The performance of untreated Larch and Douglas Fir posts after 5 years at Garston is very poor and, whilst better, still not good at Birnie Wood. All of which, whilst still inconclusive to date, suggests that the current natural durability rating for Douglas Fir heartwood in particular may require review in due course.</p>

Next Steps

The next significant inspection will be in two years' time, after 7 years in ground contact, in March 2022.

With thanks to all those backing this WPA Project



WPA Field Trial - Major Sponsors

Scottish Forestry
Grown in Britain
WPA

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Scotland – James Jones
England – BRE

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If you have any comments or questions on the content of this report or issues raised, please do not hesitate to get in touch with

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