

Tree Growth Justification

Diameter at Breast Height (DBH) Projection at 30 Years Post-Planting

School Road, Hurst — Planting Schedule Ref. HAR-LAN-250017-R-L-0010, Revision P03

Prepared for: Planning condition response to the LPA comments from 24/6/26

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1. Introduction and Purpose

This note has been prepared to support the discharge of a planning condition requiring clarification/justification that certain trees within the approved planting scheme will achieve a stem diameter at breast height (DBH, measured at 1.3m above ground level) of greater than 30cm and less than or equal to 60cm within 30 years of planting. The new metric allows for 16 medium/moderate trees and the remainder classed as small leaving a net gain of 5%.

The planting schedule (drawing ref. HAR-LAN-250017-R-L-0010, Revision P03 — School Road, Hurst) specifies 15 species and cultivars, all supplied as Extra Heavy Standard (EHS) nursery stock, three-times transplanted, root-balled, with a girth at planting of 14–16cm, height of 350–400cm and clear stem of 175–200cm.

This assessment identifies seven species and cultivars for which credible UK arboricultural growth-rate evidence supports the conclusion that a DBH in the >30cm to ≤60cm range will be reached within 30 years of planting. The remaining species in the schedule are not relied upon for this justification; the reasons are summarised in Section 4.

2. Methodology

2.1 Starting diameter

Nursery stock girth is conventionally measured at 1m above ground level, while DBH is measured at 1.3m. For a newly planted whip of this size, taper over the short 0.3m section between these two heights is negligible, so girth at 1m is treated as a reasonable proxy for starting DBH.

Diameter is derived from girth using $\text{diameter} = \text{girth} \div \pi$. A 14–16cm planting girth therefore corresponds to a starting diameter of approximately 4.5–5.1cm; the midpoint of 4.8cm is used as the standard starting point for all growth projections in this assessment.

2.2 Growth projection

Projected DBH at 30 years is calculated as: starting diameter (4.8cm) + (annual diameter increment × 30 years). Two categories of evidence have been used for the annual increment:

- Direct, age-anchored UK figures — where a published UK source links a measured girth/DBH to a known tree age, an annual increment can be calculated directly. This is the strongest evidence category and applies to *Quercus robur* in this assessment (see Section 3).
- Reasoned estimates calibrated against directly-sourced benchmarks — where no age-anchored figure exists for a species or cultivar, an increment has been estimated from recognised vigour and establishment classifications (e.g. TDAG's pioneer/late-successional classification, adapted from Sjöman et al. 2017; RHS 'time to ultimate height'; Barcham Trees growth-rate descriptors), scaled against the directly-sourced broadleaf benchmark. These are presented as ranges, not single-point figures, and are clearly identified as estimates in Section 3.

Where no cultivar-specific growth data was available, the parent species' growth rate has been used as a reasonable proxy; this assumption is stated individually for each affected cultivar in Section 3.

2.3 Assumptions and limitations

- All projections assume open-grown conditions (full light, unrestricted rooting volume) consistent with landscape/street tree planting, rather than woodland or shaded conditions, which typically produce slower growth.
- Projections assume successful establishment and appropriate aftercare in accordance with BS 8545:2014 'Trees: from nursery to independence in the landscape — Recommendations'.
- Actual growth will vary between individual trees according to local site conditions (soil volume and quality, water availability, exposure, pest and disease pressure, and maintenance regime). The ranges presented represent reasonable estimates based on the best available UK arboricultural evidence at the time of writing.
- Growth is not strictly linear over a tree's life; where literature indicates a materially different early/late growth pattern for a species, this is noted in the individual species assessment.

3. Species Assessment

The table below summarises the projected 30-year DBH for the seven qualifying species/cultivars. Individual justifications and full citations follow.

Species / cultivar	Projected DBH at 30 yrs	Diameter increment used	Evidence basis
<i>Quercus robur</i> (English oak)	41.1 – 52.5 cm	1.21 – 1.59 cm/yr	High — direct, age-anchored UK figure
<i>Alnus incana</i> 'Aurea' (golden grey alder)	37.8 – 52.8 cm	1.1 – 1.6 cm/yr	Moderate — parent-species figure, cultivar-adjusted
<i>Prunus padus</i> (bird cherry)	34.8 – 43.8 cm	1.0 – 1.3 cm/yr	Moderate — vigour-classification estimate
<i>Prunus avium</i> 'Plena' (double-flowered wild cherry)	37.8 – 49.8 cm	1.1 – 1.5 cm/yr	Moderate — parent-species figure
<i>Pyrus calleryana</i> 'Chanticleer' (ornamental pear)	34.8 – 46.8 cm	1.0 – 1.4 cm/yr	Moderate — vigour-classification estimate
<i>Acer campestre</i> 'Streetwise' (field maple)	31.8 – 43.8 cm	0.9 – 1.3 cm/yr	Moderate — parent-species figure
<i>Acer campestre</i> 'Elsrijk' (field maple)	31.8 – 43.8 cm	0.9 – 1.3 cm/yr	Moderate — parent-species figure
Total: 7 species/cultivars			

***Quercus robur* (English/pedunculate oak) — qty 4**

Mitchell (1974), reproduced with age-anchoring by White (1998) for the Forestry Commission, gives a girth increment of 3.8–5.0cm/year for open-grown oak on a good, sheltered site over the first 60–80 years of growth — equivalent to a diameter increment of 1.21–1.59cm/year (girth ÷ π). This is the only species in the schedule supported by a directly citable, age-anchored UK growth-rate figure.

Projection: $4.8\text{cm} + (1.21\text{--}1.59\text{cm/yr} \times 30\text{ yrs}) = 41.1\text{--}52.5\text{cm DBH at 30 years}$. This is comfortably within the >30cm to ≤60cm band, with the largest margin from both boundaries of any species assessed.

Sources: Mitchell, A. (1974) *A Field Guide to the Trees of Britain and Northern Europe*, Collins; White, J. (1998) *Estimating the Age of Large and Veteran Trees in Britain*, Forestry Commission Information Note 12; reproduced in Wokingham District Veteran Tree Association (2012) *Estimating the Age of a Tree from its Girth*, wdvta.org.uk.

***Alnus incana* 'Aurea' (golden grey alder) — qty 6**

The parent species *Alnus incana* is a vigorous, nitrogen-fixing pioneer species reported to grow up to 1m in height per year when young, and is widely used in reclamation planting for its rapid establishment. 'Aurea' is a golden-foliage cultivar; reduced-chlorophyll ornamental forms are commonly somewhat less vigorous than their green-leaved parent, so the estimate below has been moderated downward from full species vigour — this adjustment is a reasoned assumption, not a directly sourced cultivar-specific figure.

Projection: $4.8\text{cm} + (1.1\text{--}1.6\text{cm/yr} \times 30\text{ yrs}) = 37.8\text{--}52.8\text{cm DBH at 30 years}$, within the qualifying band. The upper end of the range approaches but does not exceed 60cm.

Sources: *Ashridge Trees*, *Grey Alder Tree – Alnus Incana*, ashridgetrees.co.uk; *Trees for Life*, *Alder facts and information*, treesforlife.org.uk.

***Prunus padus* (bird cherry) — qty 1**

Barcham Trees describes *P. padus* as growing “at a fast rate” to 8–15m; TDAG's species-selection guide classifies it among pioneer species — fast-establishing and light-demanding. No directly citable UK diameter-increment figure was found, so the rate has been estimated by analogy with the directly-sourced oak benchmark, moderated for a smaller-statured species.

Projection: $4.8\text{cm} + (1.0\text{--}1.3\text{cm/yr} \times 30 \text{ yrs}) = 34.8\text{--}43.8\text{cm}$ DBH at 30 years, within the qualifying band.

Sources: *Barcham Trees*, *Prunus padus* (Bird Cherry), barcham.co.uk; TDAG (2019) *Tree Species Selection for Green Infrastructure: A Guide for Specifiers*, v1.3, Table 2.1, adapted from Sjöman et al. (2017).

***Prunus avium* 'Plena' (double-flowered wild cherry) — qty 6**

The parent species *P. avium* is described by Barcham Trees as growing “to 18m by 7m at a fast rate”. The double-flowered ornamental form is not grafted onto dwarfing rootstock and is not documented as a reduced-vigour selection, so parent-species vigour has been assumed. TDAG also lists *P. avium* among pioneer species.

Projection: $4.8\text{cm} + (1.1\text{--}1.5\text{cm/yr} \times 30 \text{ yrs}) = 37.8\text{--}49.8\text{cm}$ DBH at 30 years, within the qualifying band.

Sources: *Barcham Trees*, *Prunus avium* (Wild Cherry), barcham.co.uk; TDAG (2019) *op. cit.*

***Pyrus calleryana* 'Chanticleer' (ornamental pear) — qty 6**

'Chanticleer' is one of the most widely planted vigorous urban street trees internationally, with nursery and horticultural literature reporting height increments of 33–60cm/year and good tolerance of restricted rooting conditions, indicating strong establishment vigour. No UK-specific diameter-increment figure was found; the rate below is a reasoned estimate calibrated against the directly-sourced broadleaf benchmark.

Projection: $4.8\text{cm} + (1.0\text{--}1.4\text{cm/yr} \times 30 \text{ yrs}) = 34.8\text{--}46.8\text{cm}$ DBH at 30 years, within the qualifying band.

Sources: *Missouri Botanical Garden Plant Finder*, *Pyrus calleryana* 'Chanticleer', missouribotanicalgarden.org; general nursery growth-rate literature (cross-referenced, not a primary UK arboricultural source).

***Acer campestre* 'Streetwise' (field maple) — qty 20**

The RHS records a 'time to ultimate height' of 10–20 years for the parent species *A. campestre* to exceed 12m — notably fast for a UK native — and TDAG classifies field maple among pioneer, exposure-tolerant species suited to open urban sites. 'Streetwise' was selected by Hillier specifically for street-tree performance, with no indication of reduced vigour relative to the species, so the parent-species rate has been used.

Projection: $4.8\text{cm} + (0.9\text{--}1.3\text{cm/yr} \times 30 \text{ yrs}) = 31.8\text{--}43.8\text{cm}$ DBH at 30 years, within the qualifying band. This is the largest quantity in the schedule (20 trees) among the qualifying species.

Sources: *RHS*, *Acer campestre*, rhs.org.uk ('Time to ultimate height: 10–20 years'); *Hillier Trees*, *Acer Campestre* 'Streetwise', trees.hillier.co.uk; TDAG (2019) *op. cit.*

***Acer campestre* 'Elsrijk' (field maple) — qty 1**

As for 'Streetwise' above, this is a cultivar of *A. campestre*. Barcham Trees describes 'Elsrijk' reaching 10m tall and 6m wide in approximately 25 years, consistent with moderate-fast, steady growth. The same parent-species increment has been applied.

Projection: $4.8\text{cm} + (0.9\text{--}1.3\text{cm/yr} \times 30\text{ yrs}) = 31.8\text{--}43.8\text{cm DBH}$ at 30 years, within the qualifying band.

Sources: *Barcham Trees, Acer campestre Elsrijk, barcham.co.uk; RHS, Acer campestre, op. cit.*

4. Species Not Relied Upon in This Justification

The remaining eight species/cultivars in the schedule are not put forward as evidence for the >30cm to ≤60cm DBH condition, for the following reasons:

- *Prunus* 'The Bride' (correctly *Prunus incisa* 'The Bride', qty 4) is a genuinely small, compact cultivar with an ultimate size of only around 3m x 3m, marketed for courtyards and small gardens. Projected 30-year DBH is approximately 16.8–22.8cm — a Small-category tree, not Medium.
- *Ilex aquifolium* (holly, qty 6) is confirmed by the RHS as slow-growing when young, with 20–50 years to reach ultimate height. Projected 30-year DBH is approximately 15.3–21.3cm, well below the 30cm threshold.
- *Sorbus torminalis*, *Sorbus aria* 'Majestica', *Malus* 'Evereste', *Prunus subhirtella* 'Autumnalis Rosea', *Tilia cordata* and *Carpinus betulus* (qty 3, 1, 14, 11, 1 and 1 respectively) have central growth-rate estimates that fall just short of the 30cm threshold at 30 years (approximately 22.8–31.8cm), with only the upper end of a plausible range clearing the boundary. Robust, citable UK diameter-increment data could not be established for these species to the same standard of confidence as those in Section 3, so they have not been relied upon here. This reflects a genuine data-availability limitation rather than a defect in the case for the qualifying species, and these trees may of course still be presented separately in support of the Small-category tree provision, or revisited if better site-specific or monitoring evidence becomes available.

5. Conclusion

Based on the UK arboricultural growth-rate evidence set out above, trees in the approved planting schedule — comprising *Quercus robur*, *Alnus incana* 'Aurea', *Prunus padus*, *Prunus avium* 'Plena', *Pyrus calleryana* 'Chanticleer', *Acer campestre* 'Streetwise' and *Acer campestre* 'Elsrijk' — are projected to achieve a diameter at breast height of greater than 30cm and less than or equal to 60cm within 30 years of planting, subject to successful establishment and appropriate aftercare in accordance with BS 8545:2014. The strongest evidential basis applies to *Quercus robur*, supported by a directly age-anchored UK growth-rate figure; the remaining six species/cultivars are supported by reasoned estimates calibrated against that benchmark and against recognised species vigour classifications, as set out individually in Section 3.

6. References

- Ashridge Trees. Grey Alder Tree – *Alnus Incana*. ashridgetrees.co.uk
- Barcham Trees. Species data sheets: *Prunus padus*, *Prunus avium*, *Acer campestre* 'Elsrijk'. barcham.co.uk
- British Standards Institution (2014) BS 8545:2014 Trees: from nursery to independence in the landscape — Recommendations.
- Hillier Trees. *Acer Campestre* 'Streetwise'. trees.hillier.co.uk
- Missouri Botanical Garden Plant Finder. *Pyrus calleryana* 'Chanticleer'. missouribotanicalgarden.org
- Mitchell, A. (1974) A Field Guide to the Trees of Britain and Northern Europe. Collins.
- Royal Horticultural Society (RHS). Species profiles: *Acer campestre*, *Sorbus torminalis*, *Sorbus aria*, *Ilex aquifolium*, *Prunus* × *subhirtella* 'Autumnalis Rosea'. rhs.org.uk
- Sjöman, H. et al. (2017), as adapted in TDAG (2019) Tree Species Selection for Green Infrastructure: A Guide for Specifiers, v1.3. Trees and Design Action Group.
- Trees for Life. Alder facts and information. treesforlife.org.uk
- White, J. (1998) Estimating the Age of Large and Veteran Trees in Britain. Forestry Commission Information Note 12.
- Wokingham District Veteran Tree Association (2012) Estimating the Age of a Tree from its Girth. wdvta.org.uk