

Moreland Tree Planting Manual for Residential Zones

(22 December 2014)

1.0 Introduction

This Manual has been prepared to provide guidance to planning permit applicants about the recommended size and species of trees to be included in landscape plans to meet the landscape requirements of the schedules to the Residential Zones. The information contained in this Manual is based on the Moreland Street Landscape Strategy (adopted 8 August 2012).

Moreland's schedules to the residential zones require the planting of suitable trees in certain locations, including:

- Front setbacks
- Side and rear setbacks
- Secluded private open space

Depending on the specific schedule, tree planting will be required in at least one of the above locations. The requirements of the relevant schedule should be referred to for confirmation of the extent of tree planting to be confirmed on landscape plans. Landscape plans are required to be submitted with permit applications.

2.0 Matching Tree Size to Available Space

The space available for tree planting will differ depending on the size of building setbacks from property boundaries and the size of secluded private open space.

The matrix in figure 1 below should be used to guide whether a large, medium or small tree should be selected. Once size of tree is determined, the tree species selection can be made (refer section 3.0 and the recommended species lists in Appendix 1).

The Tree Planting Space Matrix defines the space available to grow a tree and fits the most appropriate sized tree into the space based on the fundamental design parameter of using the largest acceptable tree in each planting situation.

The Tree Planting Space Matrix combines the width and depth of the space available for the tree to provide sufficient space for the trunk and main structural roots and for tree canopy growth. It assumes the same amount of space is available at ground level and canopy level.

A minimum planting bay of 600mm is required.

Figure 1. Tree planting space matrix

		Width of available space		
		> 4 metres	3-4 metres	1.8-3 metres
Depth of available space (eg. front setback distance)	> 4 metres	L	L or M	VS
	3-4 metres	S or M	S or M	VS
	1.8-3 metres	VS	VS	VS

Note. Where there is less than 1.8m dimension, there is insufficient room for tree planting.

2.1 Tree Size

Four basic tree size categories were developed based on the actual dimensions of available or commonly used trees and the space typically available. The four size categories are:

1. Very small: 6 or less metres tall by 6 or less metres wide
2. Small: 6 to 8 metres tall by 5 to 10 metres wide
3. Medium: 8 to 15 metres tall by 8 to 18 metres wide
4. Large: 15 or more metres tall by 15 or more metres wide

Tree sizes at maturity have been estimated. Obviously tree growth varies from one individual to another and between populations and different provenances, so wherever possible sources of trees have been identified to reduce the likelihood of trees growing much larger than anticipated.

3.0 Recommended Tree Species

The tree size matrix in section 2.0 above should be used to determine what sized tree is suitable for the available space. Once the right size is determined, the species can be selected. The recommended species lists in Appendix 1 are grouped into different sized trees.

The recommended species include a combination of indigenous, Australian native and exotic tree species that have shown to perform well in Moreland. It provides a basis for selection but is not intended to be exhaustive.

Selection of appropriate species should also consider site orientation and whether deciduous or evergreen species are more suitable to allow for summer sun and winter shading to north and west facing windows and open space.

Trees considered to be environmental weeds must not be planted. Species with weed potential or a tendency to sucker should not be planted within creek buffer zones or other environmentally sensitive areas. This applies to the following species in Appendix 1:

- *Celtis australis* and *C. occidentalis*
- *Robinia pseudoacacia*
- *Gleditsia triacanthos*

- *Olea europaea*
- *Casuarina cunninghamiana*
- *Ulmus procera*
- *Platanus xacerifolia*

Trees must be able to survive with natural rainfall. Reliance on irrigation systems is not supported.

4.0 Tree Planting and Establishment Methods

4.1 Tree Planting Details

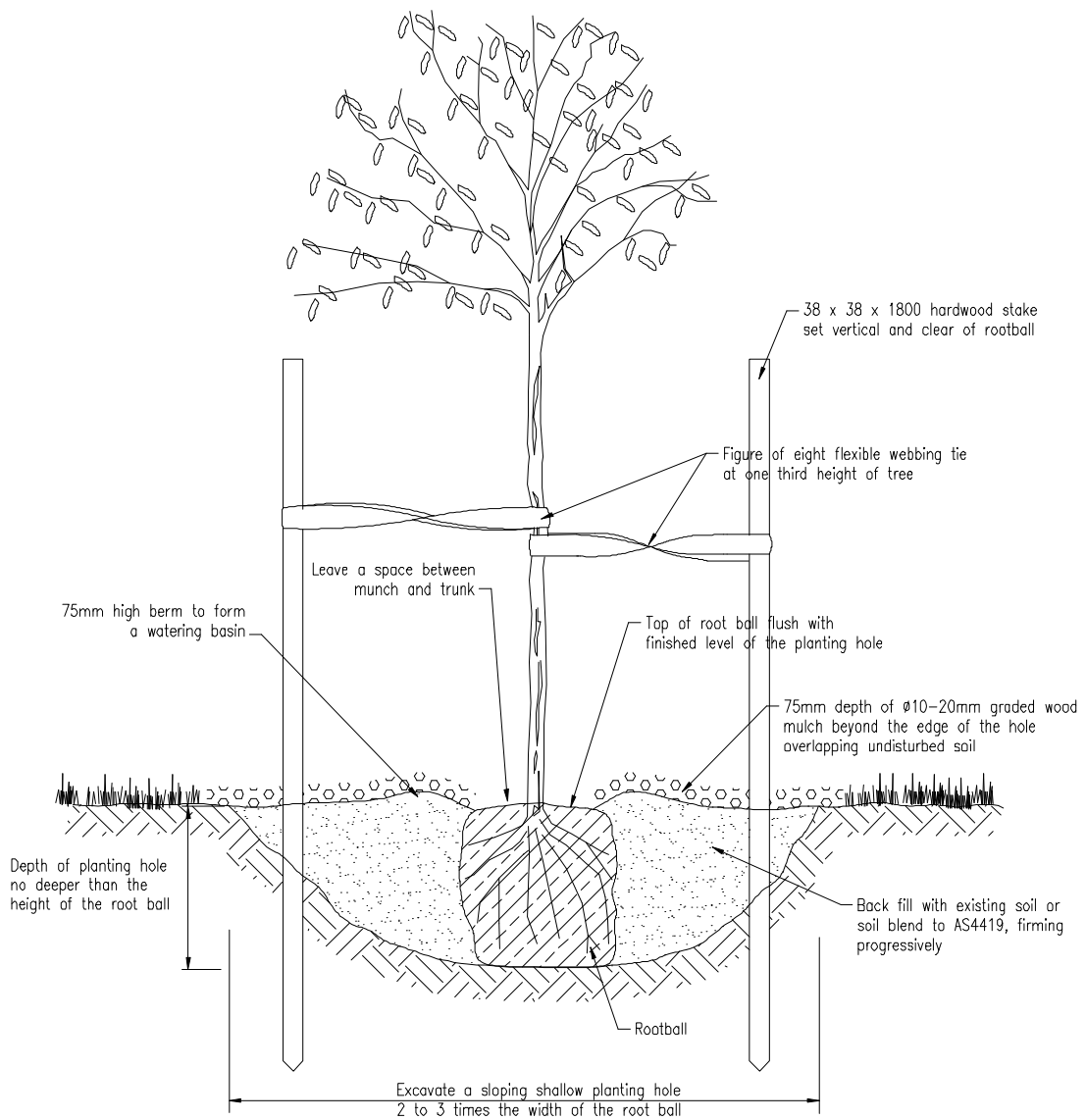
Trees at planting should be at least:

- Height – 2 metres
- Caliper width – 30mm
- Rootball - must provide enough ballast to support the tree
- A minimum planting bay of 600mm is required
- Tree should be staked on both sides for support

Refer to diagram on following page.

Other notes to consider include:

- Opportunities for passive watering (e.g. can it be connected to nearby house drain downpipes?)
- Planting configuration and context (how do proposed trees integrate with overall landscape plan onsite and in nearby public realm?)
- Consideration of underground and overhead services.



NOTES:

1. Locate services (Ring Melbourne One Call Services) prior to setting out and excavation
2. All excavation to be undertaken by hand
- 3.. Advanced trees to be approximately 2000mm high (40-50 litres container min.)
4. Apply 150 litres of water immediately after planting
5. Apply 25 grams NPK (20:4:8) at planting per square metre of root zone

4.2 Tree Maintenance

Landscape Plans should include an establishment maintenance plan. An example of a two year establishment maintenance plan is shown in the table below.

Activity	Year 1 – Number of visits	Year 2 – Number of visits
Watering	30	20
Weed control	2	1
Mulch top up	2	1
Formative pruning	-	1
Stake removal	-	1
Water well removal	-	1
Tree tie removal	-	1

The major limitations to root spread will be soil compaction from development works.

The planting hole can be dug with a number of different pieces of equipment. Recently the use of chain trenchers has become common. These devices will dig a hole of this type readily, in most soils, and will leave the excavated soil in a good tilth condition for backfilling after planting. In the sandy and loam soils in Moreland holes can be dug at most times of the year. In the basalt clay soils holes are best pre-dug during summer while the soil is dry.

Unamended site soil is recommended as backfill in all planting situations. Organic and other amendments are generally of no value and may make the planting environment worse. If organic amelioration of site soil was desired, shallow incorporation of composted organic matter (surface 100 mm only) is recommended. Surface application of organic mulches is a preferred option.

If site soil cannot be used for backfilling the planting hole, a low organic matter sandy soil is recommended. The drainage rate of this soil should be no less than 5 mm /h.

Drainage will not be required in most planting holes unless the tree is not suited to the drainage characteristics of the site or is of a very large size requiring excavation into underlying clay subsoil. Drainage will be required where trees are being planted into rain garden planters for water quality treatment of runoff water.

Improving soil conditions for trees growing in paved areas

One simple way of improving tree soil conditions is the use of raised planters that provide an improved soil volume in the root flare area and zone of rapid taper. This approach also reduces soil compaction around the base of the tree by reducing pedestrian access. If such an approach is used it is essential that the soil in the raised planter is connected to a larger soil volume below the paving.

Structural soil cells (e.g. like 'stratacell') should also be considered. They provide volume beneath paving and avoid clutter caused by raised pavers.

Appendix 1. Recommended Species List

Small trees maturing to <8m

SPECIES DETAIL		CHARACTERISTIC FORM
<i>Acacia pendula</i> Silver Myall	Native Evergreen	Rounded, small, evergreen tree to 6m, with pendulous branches and attractive silver foliage. The tree is drought tolerant and probably one of the longer lived acacias.
<i>Acer buergerianum</i> Trident Maple	Exotic Deciduous	Oval to upright, moderately dense medium sized tree to 8m. The form would suit restricted sites however will require pruning under power lines. Autumn colour is an attractive orange-red.
<i>Acer campestre</i> Hedge Maple	Exotic Deciduous	Oval to round, dense small to medium sized tree to 7m with yellow autumn foliage. Probably suitable under power lines
<i>Acer monspessulanum</i> Montpelier Maple	Exotic Deciduous	Dense large shrub to small tree to 6m with a rounded crown and red-orange autumn foliage.
<i>Agonis flexuosa</i> West Australian Willow Myrtle	Native Evergreen	Broad spreading, multistemmed, semi pendulous small tree to 8m. Attractive small, white flowers cluster along stems from spring to summer.
<i>Agonis flexuosa</i> 'Burgundy' Burgundy Willow Myrtle	Native Evergreen	Broad spreading semi pendulous small tree with strong burgundy new growth. Attractive small, white flowers cluster along stems from spring to summer.
<i>Agonis flexuosa</i> 'Jervis Bay After Dark' After Dark Willow Myrtle	Native Evergreen	Broad spreading semi pendulous small tree with burgundy to purple coloured foliage all year round. Attractive small, white flowers cluster along stems from spring to summer.
<i>Allocasuarina verticillata</i> Drooping She-Oak	Indigenous Evergreen	Small rounded spreading tree to 6-8m with an open canopy and needle-like, dark green foliage.
<i>Callistemon Cultivars</i> Bottlebrush	Native Evergreen	Large shrubs to small rounded trees to 4-8m. There are many cultivars with varying flower colours, foliage and habits. Cultivars include: 'Dawson River Weeper', 'Endeavour', 'Hannah Ray', 'Harkness', 'Kings Park Special', 'Mauve Mist' and 'Rose, Opal'.
<i>Callistemon sieberi</i> River Bottlebrush	Indigenous Evergreen	Open to dense semi weeping shrub or small tree to 4-7m. Flowers are spikes of cream to pink borne from late spring to late autumn.
<i>Callistemon viminalis</i> Weeping Bottlebrush	Native Evergreen	Rounded small tree to 5m, with crimson bottlebrush flowers and pendulous foliage.
<i>Catalpa bignonioides</i> 'Nana' Dwarf Indian Bean Tree	Exotic Deciduous	Top-grafted small tree to 2-4m with large, lush, leaves and a rounded habit, suitable for restricted locations.
<i>Eucalyptus forrestiana</i> Fuchsia Mallee	Native Evergreen	Small mallet or mallee eucalypt less than 8m tall. The canopy is open and rounded with showy, pendulous orange-red flowers. The fruits are persistent on the tree and remain an orange-red colour.
<i>Eucalyptus macrandra</i> River Yate	Native Evergreen	Small tree or mallee to 3-6m with silvery green glossy foliage. The yellow flowers are in dense clusters from summer to autumn and the smooth grey bark peels to reveal coppery patches.
<i>Eucalyptus platypus</i> Moort	Native Evergreen	Small, dense and rounded tree to 6-10m. The leaves are small, round and glossy green and the trunk is glossy green to copper in colour.
<i>Eucalyptus risdonii</i> Risdon Peppermint	Native Evergreen	Small, short-trunked irregular tree reaching a height of 6-8m with grey-green adult foliage higher in the canopy.

Small trees maturing to <8m

SPECIES DETAIL

<i>Eucalyptus torquata</i> Coral Gum	Native Evergreen	Small open tree to 6-8m tall. The foliage is olive green and the flowers are a pinkish orange in colour throughout spring and summer.
<i>Ficus microcarpa</i> var. <i>hillii</i> Hills Fig	Native Evergreen	This fig is traditionally planted in streets and pruned into a round ball approximately 2m in size. Trees are usually only 2-4m tall. The foliage is a lustrous, bright green.
<i>Fraxinus ornus</i> Manna Ash	Exotic Deciduous	Small, rounded tree to 7-9m tall. Foliage is a lush green without showy autumn colour. The white flowers are showy and borne in dense clusters.
<i>Gleditsia triacanthos</i> 'Sunburst' Sunburst Honey Locust	Exotic Deciduous	Upright spreading small tree to 8m with light yellow-green fine leaflets.
<i>Hakea bucculenta</i> Hot Pokers	Native Evergreen	Large shrub or small tree to 3-4m with an upright habit. The leaves are linear and stand vertical on the tree. The flowers are striking pink 'pokers' borne in winter.
<i>Hakea petiolaris</i> Sea Urchin Hakea	Native Evergreen	Shrub or small dense tree to 4-5m tall. Foliage is grey-blue, elliptical to almost round. Flowers are showy, pink and white in balls that resemble 'sea urchins'.
<i>Lagerstroemia Hybrids</i> Crepe Myrtle	Exotic Deciduous	Multistemmed widespreading tree to 6-8m tall. The flowers are very showy in summer and the autumn colour is quite striking. Cultivars include, 'Lipan', 'Natchez', 'Sioux', 'Tuscarora', 'Yuma' and 'Zuni'.
<i>Malus ioensis</i> 'Plena' Ornamental Apple	Exotic Deciduous	Small oval to rounded tree to 4-5m tall. The double flowers are showy in spring and the foliage displays striking autumn colour.
<i>Olea europaea</i> Olive	Exotic Evergreen	Small upright tree to 6-7m tall. The foliage is a silvery green and the trunk forms a twisted gnarled look with age. Two selections are almost fruitless, 'Swan Hill' or 'Tolley's Upright'.
<i>Prunus xblireana</i> Double Flowering Plum	Exotic Deciduous	Small tree to 4-6m tall, the double pink flowers in spring give way to bronzy-purple foliage.
<i>Robinia pseudoacacia</i> 'Inermis' Mop Top Robinia	Exotic Deciduous	Top-grafted small tree to 3-4m, producing a straight clean trunk and a large 'ball' of foliage at 2-3m. Can be striking when planted as an avenue.
<i>Tristaniopsis laurina</i> Water Gum	Native Evergreen	Rounded to broad spreading small to medium tree to 8m. The foliage is glossy and green and the trunk often forms a gnarled and mottled appearance with age.

CHARACTERISTIC FORM

SPECIES DETAIL

<i>Acacia implexa</i> Lightwood	Indigenous Evergreen	Small to medium erect evergreen tree to 8m tall, with dense bright green foliage and creamy acacia flowers from summer to autumn.
<i>Acacia melanoxylon</i> Blackwood	Indigenous Evergreen	Upright to spreading dense medium to large tree, with dark green foliage. Performs best with supplementary water during establishment.
<i>Acer truncatum</i> x <i>A. platanooides</i> 'Warrenred' Pacific Sunset Pacific Sunset Maple	Exotic Deciduous	 Rounded to oval medium-sized tree to 8m providing attractive autumn colour.
<i>Allocasuarina littoralis</i> Black She-Oak	Indigenous Evergreen	Upright conical small tree to 8-10m with needle-like, dark green foliage and a trunk developing hard furrowed bark.
<i>Banksia integrifolia</i> Coastal Banksia	Native Evergreen	Erect small to medium tree to 6-10m. Foliage is green on the top and white underneath. Flowers are yellow spikes borne throughout the year.
<i>Brachychiton acerifolius</i> Flame Tree	Native Semi-deciduous	Erect oval to conical medium sized tree to 8-12m. The tree can be deciduous from late winter to summer. The leaves are large with 3-7 lobes and the flowers are bright scarlet in terminal panicles from late spring to early summer.
<i>Brachychiton discolor</i> Queensland Lacebark Tree	Native Semi-deciduous	Dense conical tree to 15m tall with large, mostly palmate leaves that are green on the top side and hairy and white on the underside. Flowers are small 3-4cm long and orange-red to pink over summer.
<i>Brachychiton populneus</i> Kurrajong	Native Evergreen	A medium-sized upright to oval canopied tree with a large trunk to 10-12m tall. The leaves are mostly small and bright green, flowers are inconspicuous.
<i>Callistemon salignus</i> Willow Bottle Brush	Native Evergreen	Upright rounded large shrub to small tree to 9m. The foliage is a bright green with new foliage pink. Flowers are small, yellow bottlebrushes and the bark is papery and peeling.
<i>Celtis australis</i> Nettle Tree	Exotic Deciduous	Broad-crowned tree to 10-12m tall. The bark is smooth and grey, foliage is green and rough with serrated margins.
<i>Celtis occidentalis</i> Hackberry	Exotic Deciduous	Broad-crowned tree to 10-15m tall. The bark is grey and furrowed with age, foliage is green and glossy with serrated margins.
<i>Corymbia eximia</i> Yellow Bloodwood	Native Evergreen	Rounded tree to 10-12m tall with pendulous, blue-green, sickle-shaped foliage. Masses of creamy flowers are borne on the outside of the canopy in spring.
<i>Corymbia ficifolia</i> Red Flowering Gum	Native Evergreen	Dense rounded tree to 8-10m. Masses of pink, red or orange flowers are borne on the outside of the canopy over summer.
<i>Eucalyptus leucoxyloides</i> subsp. <i>connata</i> Yellow Gum	Indigenous Evergreen	Medium upright to oval tree to 12m with an open canopy and creamy yellow flowers from winter to spring. The bark is more or less smooth with some rough basal peeling bark, white to grey in colour.
<i>Eucalyptus polyanthemus</i> subsp. <i>vestita</i> Red Box	Indigenous Evergreen	Round-headed to upright eucalypt to a height of 10-12m. Adult leaves are a slate grey colour and bark is rough 'box'.

CHARACTERISTIC FORM

Medium-sized trees maturing to 8-15m

SPECIES DETAIL

Species Name	Native/Exotic	Evergreen/Deciduous	Characteristic Form
<i>Eucalyptus pulchella</i> White Peppermint	Native	Evergreen	Medium sized, oval to rounded tree to 10-15m with an open canopy. The trunk mostly smooth and white and the leaves are narrow and pendulous creating a weeping effect.
<i>Eucalyptus scoparia</i> Wallangarra Gum	Native	Evergreen	Medium to tall open tree to 12-18m tall. Trunk is a powdery white and the foliage is semi-pendulous and green in colour.
<i>Fraxinus excelsior 'Aurea'</i> Golden Ash	Exotic	Deciduous	Small to medium, slow growing tree 8-10m tall. New stems are yellowish in colour with almost black winter buds. Foliage is bright green turning golden in autumn.
<i>Fraxinus pennsylvanica 'Urbidell' Urbanite™</i> Urbanite Green Ash	Exotic	Deciduous	Medium sized tree 10-12m with large, pinnate, bright green leaves. Autumn colour is variable from yellow to deep burgundy.
<i>Gleditsia triacanthos 'Shademaster'</i> Shademaster Honey Locust	Exotic	Deciduous	Vigorous growing, open spreading tree to 10-12m tall. Foliage is divided into small leaflets that provide yellow autumn colour.
<i>Hymenosporum flavum</i> Native Frangipani	Native	Evergreen	Small to medium-sized tree 6-10m tall. Glossy, dark green foliage and small, fragrant, yellow flowers in spring.
<i>Jacaranda mimosifolia</i> Jacaranda	Exotic	Deciduous	Small to medium-sized spreading tree to 8-12m with an open canopy. The foliage is divided into many fine leaflets. The lilac-blue flowers are very showy and are borne on the outside of the canopy in late spring to summer.
<i>Lophostemon confertus</i> Queensland Brush Box	Native	Evergreen	Rounded, sometimes multistemmed, dense tree to 12-16m. The foliage is a glossy, dark green and the bark peels to reveal an orange-pink trunk.
<i>Melia azederach</i> White Cedar	Native	Deciduous	Small to medium umbrella shaped tree to 9-14m tall that performs well in urban conditions. The leaves are large and finely divided into small leaflets. The tree has mauve flowers in spring and fruit mature over summer and hang on the tree.
<i>Pyrus calleryana 'Aristocrat'</i> Aristocrat Callery Pear	Exotic	Deciduous	Oval to pyramidal small to medium tree to 10-12m tall. White flowers amass the stems in spring followed by bright green foliage. The autumn colour varies from yellow to red.
<i>Pyrus calleryana 'Capital'</i> Capital Callery Pear	Exotic	Deciduous	Narrow, upright small tree to 10m. White flowers amass the stems in spring followed by bright green foliage. The autumn colour varies from yellow to purplish-red.
<i>Pyrus calleryana 'Glen's Form' Chanticleer®</i> Chanticleer Callery Pear	Exotic	Deciduous	Upright oval small to medium tree to 12m. White flowers amass the stems in spring followed by bright green foliage. The autumn colour varies from yellow to purplish-red.
<i>Ulmus parvifolia</i> Chinese Elm	Exotic	Semi-deciduous	Pyramidal to oval small to medium tree to 12m. The foliage is fine and is usually held on the tree over winter. If not managed the form can become very wide and spreading.
<i>Zelkova serrata</i> Zelkova	Exotic	Deciduous	Semi-upright oval to vase shaped tree to 10-14m tall with small serrated leaves that turn yellow and red in autumn. Ornamental trunk is grey peeling to reveal reddish underneath.

CHARACTERISTIC FORM

Large trees maturing to >15m

SPECIES DETAIL

<i>Angophora costata</i> Smooth-barked Apple Myrtle	Native Evergreen	Medium to large rounded tree with twisting branches to 12-25m. Showy cream flowers are borne on the outside of the canopy and the bark peels to reveal an orange pink trunk.
<i>Casuarina cunninghamiana</i> River She-Oak	Native Evergreen	Tall, upright, somewhat pine-like tree to 12-18m with needle-like, dark green foliage. The overall appearance of mature specimens is often pendulous.
<i>Corymbia citriodora</i> Lemon-scented Gum	Native Evergreen	Narrow open medium to large, graceful tree to 20-25m. The trunk is smooth grey to white and the foliage smells strongly of lemon when crushed.
<i>Corymbia maculata</i> Spotted Gum	Native Evergreen	Medium sized to very tall upright tree to 25m with smooth mottled grey and dark grey trunk. The canopy is dense with large dark green eucalypt type leaves.
<i>Eucalyptus mannifera</i> Brittle Gum	Native Evergreen	Medium to tall open tree to 12-18m tall. Trunk is a powdery white and the foliage is semi-pendulous and blue-green in colour.
<i>Eucalyptus melliodora</i> Yellow Box	Indigenous Evergreen	Medium to tall open tree to 20-25m. The bark is rough and tightly held to the trunk and the foliage is semi-pendulous.
<i>Eucalyptus sideroxylon</i> Red Ironbark	Native Evergreen	Medium to tall forest tree to 12-25m. Mature trunks have deeply furrowed firmly attached reddish black bark. The foliage is a blue-green with red to cream flowers produced from winter to spring.
<i>Maclura pomifera</i> 'Witchita' Witchita Osage Orange 'Witchita'	Exotic Deciduous	Medium to tall, broad-crowned tree to 10-16m tall. The foliage is large and lush, bright green over summer and turns butter yellow through autumn. The selection is fruitless and thornless.
<i>Platanus orientalis</i> Plane	Exotic Deciduous	Pyramidal to rounded medium to large tree to 15-25m with deeply lobed foliage. The bark forms a patchy mosaic of creams, greens and greys and is attractive.
<i>Platanus xacerifolia</i> London Plane	Exotic Deciduous	Rounded medium to large tree to 15-25m with maple like foliage. The bark forms a patchy mosaic of creams, greens and greys and is attractive.
<i>Quercus ilex</i> Holm Oak	Exotic Evergreen	Slow growing medium to large tree developing a rounded canopy to 14-16m tall. Small leaves are a dark, glossy green with a lighter underside.
<i>Quercus palustris</i> Pin Oak	Exotic Deciduous	Broadly pyramidal medium to tall tree to 18-20m tall. Leaves are heavily lobed and provide a good autumn display.
<i>Quercus robur</i> 'Fastigiata' Fastigiata English Oak	Exotic Deciduous	Narrow, upright tree to 10-15m with small lobed leaves. Autumn foliage colour is not exceptional.
<i>Ulmus procera</i> English Elm	Exotic Deciduous	Dense, rounded tree to 15-20m tall. Rounded, dark green, serrate leaves of varying size turn yellow in autumn.

CHARACTERISTIC FORM