



Bayside Council

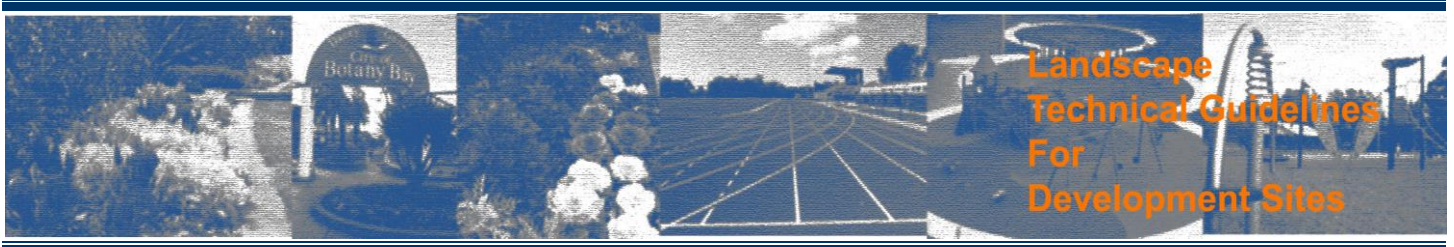
Serving Our Community

Part 10

Landscape Technical Guidelines for Development Sites

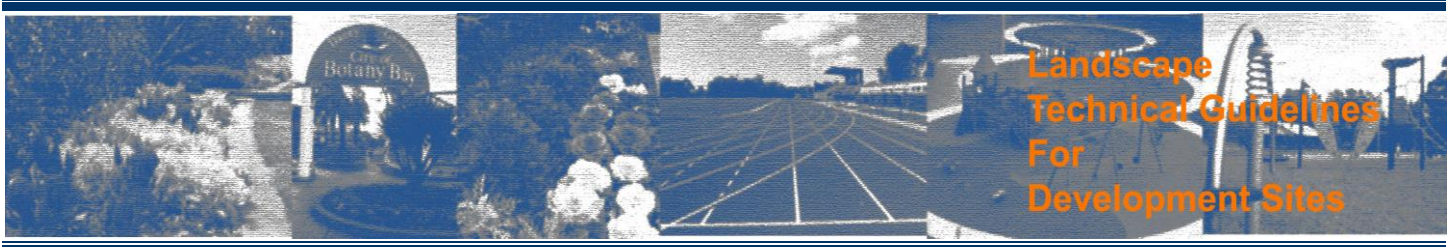
Botany Bay Development Control Plan 2013





Contents

1. Introduction	4
2. Site Preparation	5
2.1 Clearing	5
3.0 Earthworks	6
3.1 Earth Embankments	6
4.0 Landscape Hard Works	7
4.1 Driveway Crossings	7
4.2 Edges and Retaining Walls to Planter Beds and Landscaped Areas.....	7
4.3 Heritage Items and Relics.....	7
4.4 Landscape Furniture and Public Art	8
4.5 Amenity and Area Lighting.....	8
4.6 Planting On Slab or Podium, Elevated Planter Boxes, Roof Gardens, Green Roofs, Green and Living Walls	9
4.7 On-site Stormwater Detention (OSD)	10
4.8 Playground Equipment Recommendations.....	11
4.9 Paving.....	11
4.10 Permeable Paving	11
4.11 Public Domain	12
4.12 Retaining Walls.....	12
4.13 Utilities (electrical and fire).....	13
5. Landscape Soft Works	14
5.1 Existing Vegetation	14
5.2 Protection of Existing Trees.....	14
5.3 Water Sensitive Urban Design (WSUD) / Site Responsive Stormwater Design	15
5.4 Irrigation.....	16
5.5 Natives and Indigenous Vegetation	17
5.6 Soil Improvement and Fertilisers	17
5.7 Mulch	17
5.8 Imported Landscape Soils	18
5.9 Lawns and Turf Grass	18
5.10 Root Control Barriers.....	18
5.11 Landscaping on Development Sites	18
5.12 Planter Bed Sizes	20
5.13 Planting in the Public Domain.....	20



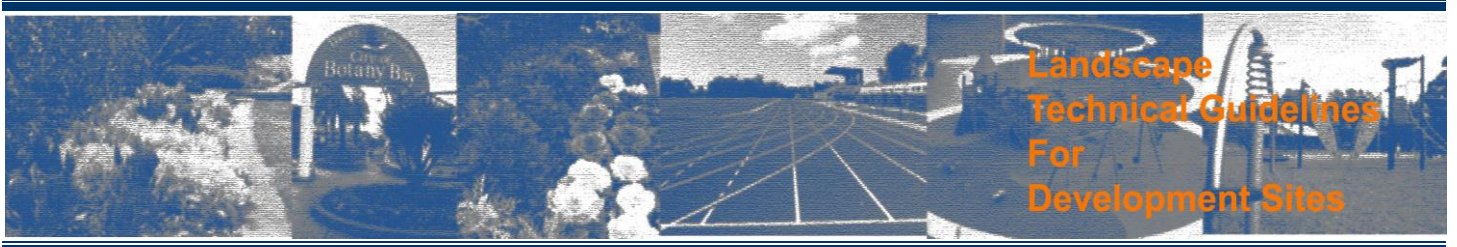
5.14 Energy Efficient and Ecologically Sustainable Landscaping Practices 21

Appendix 1 – Plant Species Known to Grow Well in the Botany Bay Area 24

Appendix 2 – Indigenous Species 30

Appendix 3 – Noxious Weeds 31

Appendix 4 – Environmental Weeds 35

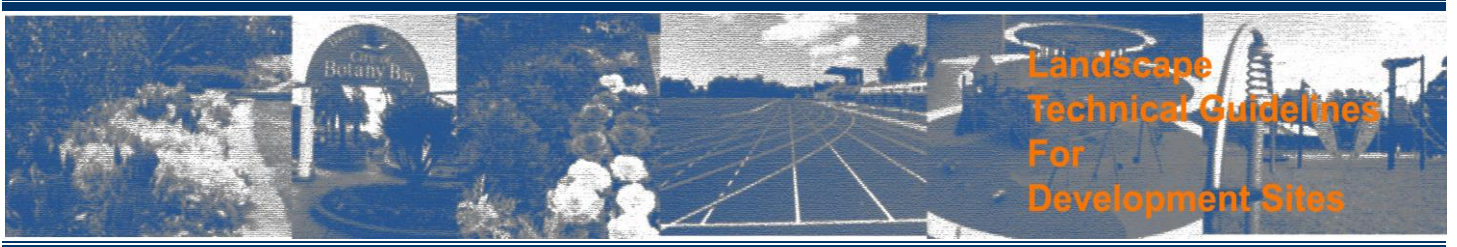


1. Introduction

These Technical Guidelines must be read in conjunction with Botany Bay Development Control Plan 2013, which provides the general objectives and controls for landscaping and the more specific landscape controls for various land uses and development types and provides additional information in relation to tree preservation, stormwater, biodiversity and green roofs and living walls.

Minimum landscape requirements exist for each development type within the City. The requirements indicate how the development is to comply in order to obtain Council approval and to provide the most appropriate landscape outcome for the site.

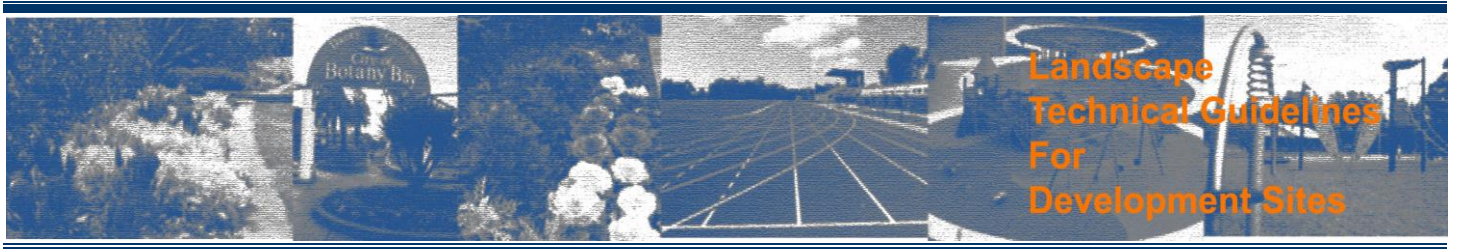
This guideline has been produced to establish a benchmark for landscaping standards and best practice guidelines for the landscape construction. By adopting and these standards a unified landscape character will be created throughout the City that will produce visual consistency, good design and an overall identity for the site and the City.



2. Site Preparation

2.1 Clearing

Clear only trees and vegetation that has been approved for removal by Council through Development Approval or Tree Preservation Order permit.



3.0 Earthworks

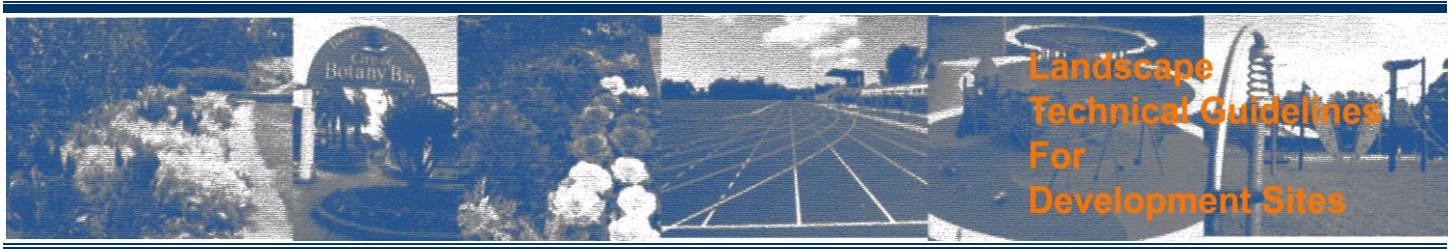
3.1 Earth Embankments

Earth mounds and embankments shall be setout and constructed in accordance with approved landscape and/or civil plans and constructed to ensure minimal slumping and post-construction settling.

Council requires the following:

- (i) Maximum grade 1 in 4;
- (ii) All imported fill to be certified clean fill, re-use of existing site soil (unless contaminated) is preferable;
- (iii) Fill layers to be 100-150mm thick and compacted to at least 90% of the dry density ratio of the surrounding soil, as specified by AS1289:2000 - Methods of Soil Testing for Engineering Purposes, to minimise slumping and further compaction/settling post-construction;
- (iv) Ensure a gradual, rounded finished profile at corners and intersections of planes unless retaining walls or edging are incorporated;
- (v) There should be a minimum 500mm wide shoulder between surrounding levels and commencement of grading.
- (vi) A settling is required prior to turfing/plantings
- (vii) Grade to ensure water is directed away from buildings and there are no low points that would result in ponding of stormwater.

Embankments are to be stabilized where necessary to prevent erosion or soil movement by using approved bank stabilisation techniques such as erosion control matting, fibrous matting, rock stabilisation, edges and retaining walls. Use an appropriate weight material for seeding and/or planting.



4.0 Landscape Hard Works

4.1 Driveway Crossings

In order to retain a uniform and visually cohesive streetscape, Council does not permit driveway crossovers (between site boundary and kerb) to be paved in any material other than plain concrete eg. unit pavers, stencilled, stamped or coloured concrete.

To preserve street trees and streetscape, driveway crossovers in residential areas shall be limited to one (1) standard crossover per allotment. All crossovers are to retain existing street trees and are to be located accordingly.

4.2 Edges and Retaining Walls to Planter Beds and Landscaped Areas

Concrete retaining edges are required around all garden beds to limit the movement of soil and mulches to adjoining hard surfaces.

Hard edges must be a minimum of 150mm in height above adjoining surfaces to prevent the encroachment of vehicles into planter beds.

Timber edges are unsuitable. Other masonry finishes are approved on merit. Small retaining walls may be constructed from concrete blocks with a suitable robust render or finish applied.

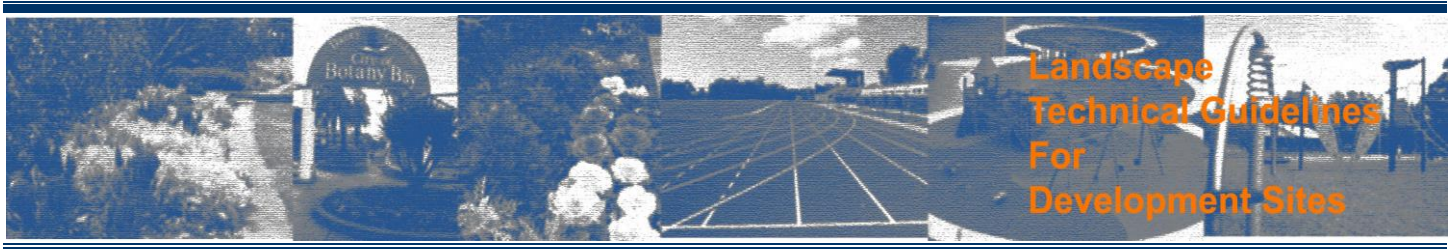
Timber edges are permissible where planter beds adjoin grassed areas either as sleeper edges or to finish flush. Koppers logs are unsuitable.

Trees in grassed areas should be surrounded by a timber edge at least 1.2 metres from the tree trunk to keep grass clear from tree trunks.

All hard edges on curves shall be laid in a smoothly curving form and constructed from formed or extruded concrete, masonry, galvanised steel or marine ply. PVC edging is not permitted.

4.3 Heritage Items and Relics

On heritage sites, historical items of significance should be incorporated into the overall landscape design (where appropriate) enabling their preservation and appreciation. This includes remnant garden elements and trees. The landscape design should not only retain items of natural, cultural or architectural significance, but should also be designed appropriately (by a heritage landscape architect) to ensure the heritage values of the site are appropriately integrated into the landscape.



4.4 Landscape Furniture and Public Art

Embellishment of landscapes and open spaces with furniture is encouraged in medium and high density residential and commercial developments to embellish, add character, functionality and usage of landscaped open spaces.

Landscape furniture includes seating, litter bins, bollards, bicycle racks, drinking fountains, tree guards, planter tubs and troughs, pedestrian/area lighting, BBQ's, awnings/shelters and the like. In public domain areas, furniture selection shall be to Council specification and form part of the development approval or Voluntary Planning Agreement. All landscape furniture must be sited and detailed in the landscape documentation.

Water features can mask undesirable traffic or industrial noise and can be a visual feature or focal point in communal open spaces or entranceways.

Similarly, public art and sculpture can play a role in reflecting the identity of the local area and celebrating its history, culture and innovations. It can deliver a range of benefits to the community including visual and cultural enrichment of individual developments and the public domain, transformation of the urban fabric, meaning to places making them memorable and gives the community access to, appreciation and enjoyment of art promoting a range of educational, environmental, and social messages.

Public art can be integrated into private developments, community facilities, parks and public domain improvements.

The provision of high quality public art with a relevance to the context of the site, a consideration for public safety and access and incorporating low maintenance and durability is promoted.

As part of the development approval process, Council would require developers to engage and install appropriate public artworks in private developments or the public domain where that artwork could provide a positive contribution to the community and the streetscape.

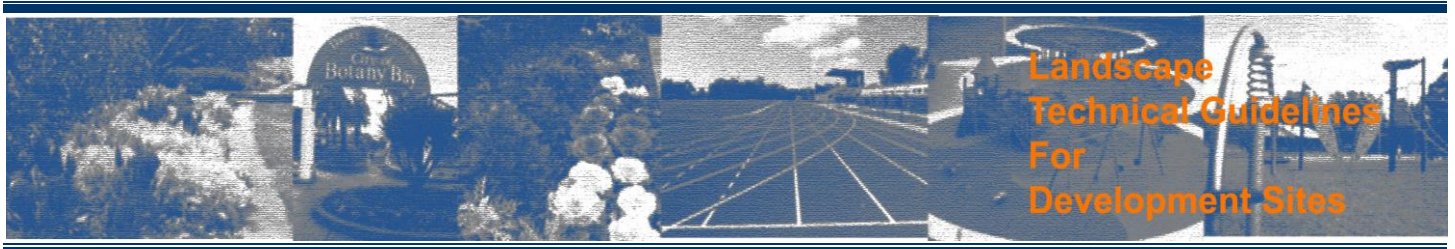
4.5 Amenity and Area Lighting

Pedestrian safety lighting is a Council requirement of medium and high density residential and commercial developments. Lighting shall be spaced in accordance with the lux levels of the fitting selected and in accordance with Australian Standards including AS 4282:1997.

Solar powered or LED lighting is recommended.

Lighting shall allow for adequate and continuous illumination of pathways, accessways and open spaces in a development at night. Landscape lighting in garden beds may also be utilised in a development but is in addition to the pedestrian lighting requirement.

Lighting shall be designed and located so as not to cause adverse impact on the amenity or nuisance to surrounding residents, motorists or adjoining residents through light spill.



4.6 Planting On Slab or Podium, Elevated Planter Boxes, Roof Gardens, Green Roofs, Green and Living Walls

Green Rooves, Green and Living Walls.

Integrating plants with the built environment has many advantages: it improves the visual and aesthetic amenity and outlook of buildings, provides habitat, ameliorates pollution (absorbs noise, absorbs dust and pollutants, recycles carbon dioxide), absorbs heat (reduced heat island effects), re-uses rainwater, reduces energy costs due to their insulation properties and generally, simply increasing green spaces.

All green rooves and green (living) walls must be designed by a landscape architect or landscape consultant specialising and experienced in this type of landscape design so as to ensure the landscape areas are suitably constructed to be integrated with the building and supportive of plant life, to incorporate appropriate plant selection, to ensure useful and site responsive design and to ensure the long term survival of the landscaping.

Refer to **Part 3L - Landscaping** for controls in regards to Green Roofs.

Elevated planter boxes on podium

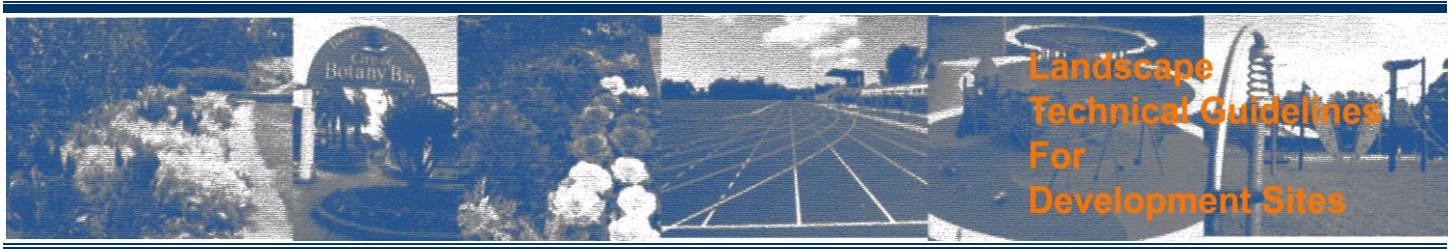
Trees grown in these situations are subject to a broad range of environmental stresses that affect their health, vigour and ultimate size and survival. Where planting is to be carried out on a suspended concrete slab (roof gardens, balconies, over car parks) there must be **average soil depths of 1000mm for trees, 500mm for shrubs and 300mm for lawns.**

Soil volume and planter bed area are equally as critical, if not more so than depth, and the dimensions are to be suitable for the size of plants (namely trees) selected. Square, rectangular or round planters that allow for root spread and root anchoring are preferred over narrow or linear planters. The dimensions of the planter box shall increase incrementally based on the tree species selected. In other words, ensure planter box proportions can accommodate the largest volume of soil possible:

- Large canopy trees (8-10 metres in height) – min. soil depth 1300mm, planter dimensions 10 x 10 metres;
- Medium canopy trees (5-8 metre height) – min. soil depth 1000mm, planter dimensions 6 x 6 metres;
- Small trees (3-4 metre height) - min. soil depth 800mm, planter dimensions 4 x 4 metres;
- Shrubs - min. soil depth 500mm;
- Groundcovers - min. soil depth 300- 450mm; and
- Lawns - min. soil depth 300mm.

All planted areas must include sub-surface drainage, drainage cell, drainage layer/aggregate and irrigation.

On developments where landscaping is provided in elevated areas over concrete slab the landscape design must include medium and large canopy trees to provide suitable privacy screening and softening of the built form. The use of small trees only is not acceptable.



Elevated planter boxes and landscaped areas on suspended slab are to be Structural Engineer designed to determine and design for weight loadings. Internal drainage within the structure is required and is to be designed by a Structural and/or Hydraulics Engineer. External drainage weep holes are not permitted.

Landscape sectional details illustrating the construction of the elevated planter bed/box are required and to be in accordance with the following:

- (i) Planter boxes shall be built to ensure soil depths above.
- (ii) The base of the planter must be screeded to drain all parts to a piped internal drainage outlet connected to the stormwater system, minimum diameter 90mm. No external weep holes. Turf areas require a min. 5% cross fall.
- (iii) A mortar haunch shall be constructed on the inside *of* the planter to ensure there is no external seepage between the floor and walls of the planter.
- (iv) Planters are to be fully waterproofed and sealed internally with 2 coats of a proprietary sealing agent. All sealed finishes are to be sound and installed to manufacturer's directions prior to backfilling.
- (v) There must be adequate filtration of soil. Drainage cell must be applied to the base and sides of the planter. Apply filter fabric to the base and sides prior to backfilling with an imported lightweight soil suitable for planter boxes and that is compliant with AS 4419 and AS 3743.
- (vi) Provide a decorative exterior finish to co-ordinate with building finishes and indicate in the landscape documentation.

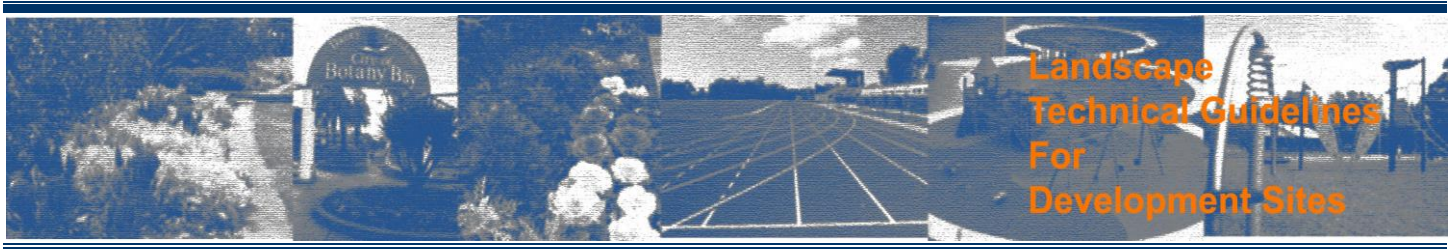
4.7 On-site Stormwater Detention (OSD)

Sub-surface concrete stormwater tanks and infiltration trenches are not to be located in areas to be landscaped, including the boundary setbacks of a development.

Where this is unavoidable due to drainage invert levels they are to be located underneath driveway/vehicle circulation areas to maximise the area available for deep soil tree planting and landscaping on the site. If this cannot be achieved then the tank/trench should not cover greater than 50% of the landscape area, be appropriately located to allow effective tree planting and be constructed at a depth to permit planting above, including trees, to ensure deep soil landscape requirements are met. Refer to 3.6 for soil depth requirements over podium. No OSD or infiltration trench shall be located under the canopy dripline of existing trees or within an area (3-4 metres outward) of the canopy dripline.

Above-ground rainwater tanks are not to be located within the front setback of a property or visible from a public street.

Refer to Council's **Stormwater Management Technical Guidelines**.



4.8 Playground Equipment Recommendations

Where a developer elects to include playground equipment in the communal open space area of a medium or high density residential development, the equipment should be purchased from a reputable supplier that certifies the design and construction of its equipment in accordance with all relevant Australian Standards for playground equipment. Certified playground approved softfall undersurfacing shall also be provided under all play equipment in accordance with Australian Standards.

Where playground is to be provided by a developer in a public park in accordance with any Voluntary Planning Agreement, the playground shall be designed in conjunction with Council.

4.9 Paving

Paver selection shall be specified in the landscape documentation, including sectional construction details, and included in the Schedule of Finishes. Unit pavers or tiles are the preferred finish in large scale residential and commercial developments. A limited amount of concrete paving may be incorporated however large expanses or lengths of concrete should be alleviated through the use of paver banding/headers, cobbles and the like particularly to delineate pedestrian zones, entries, transition zones or other special use areas. The use of contrasting finishes to break up large areas of concrete is also applicable to industrial developments. Paving and tiling shall comply with Australian Standards for slip resistance.

Asphalt or bituminous pavements are generally not permitted except for vehicular loading, manoeuvring and parking areas in industrial and commercial developments. However the external at-grade parking areas can be paved in a contrasting finish to enhance the appearance of these areas.

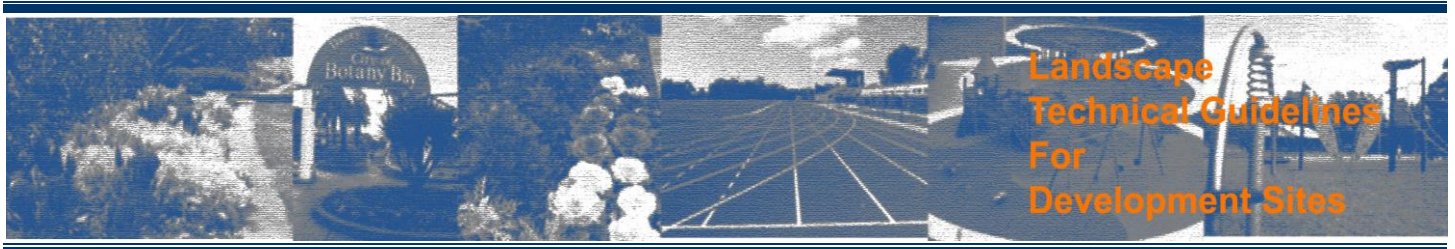
Stencilled/stamped concrete is permitted only in the private driveways of detached residential dwellings due to its propensity for surface wear through continued use. Requirements are that there are no services or utilities underneath the area to be paved, the surface be sealed (and regular re-sealing) and that a header course be included along edges.

Pre-cast concrete stepping stones in utility areas shall have a joint of no more than 50mm, backfilled with gravel, if used for foot traffic.

Some industrial and commercial developments may be required to use concrete interlocking pavers in parking and vehicular use areas eg. Green Street, Meadow Way.

4.10 Permeable Paving

Permeable pavements are encouraged as part of an overall Water Sensitive Urban Design (WSUD) approach for the re-use of surface stormwater and runoff on a development site. Permeable pavements allow water and air exchange to plant roots and the soil, reduce the amount of runoff entering the stormwater system, provide visual and textural relief to paved areas and allow natural infiltration of stormwater in large areas of paving. Permeable paving helps protect large, established trees where their root systems are extensive and some paving is unavoidable.



Suitable permeable pavements include:

- Crushed granite and gravels; and
- Resin bound aggregates (usually tree pit applications only) or pre-fabricated permeable masonry paving units (laid over the recommended aggregate).

A small amount of cement in loose mixtures (3-5%) aids compaction and stability while allowing water infiltration. All loose surfaces shall be suitably graded, retained at edges and drained to prevent loose surface materials entering the stormwater system or spilling onto other pavements or garden beds during heavy rainfall.

Paving on the public footway will be specified by Council.

4.11 Public Domain

Developers may be required to upgrade the public domain areas adjoining the development as part of the landscape plan associated with the development application or under a Voluntary Planning Agreement. Embellishments may include new footpath (including specialised treatments such as segmental paving), furniture and landscaping.

All work would be required to be undertaken in accordance with Council specifications and directions and any work undertaken on public land must have the necessary approvals in place prior to construction.

Any work carried out on public property must have all of the necessary prior approvals and permits from Council in place prior construction.

Contractors shall hold the following insurances:

- Public liability insurance;
- Indemnification agreement;
- Product liability and workers compensation insurance,; and
- Builders license.

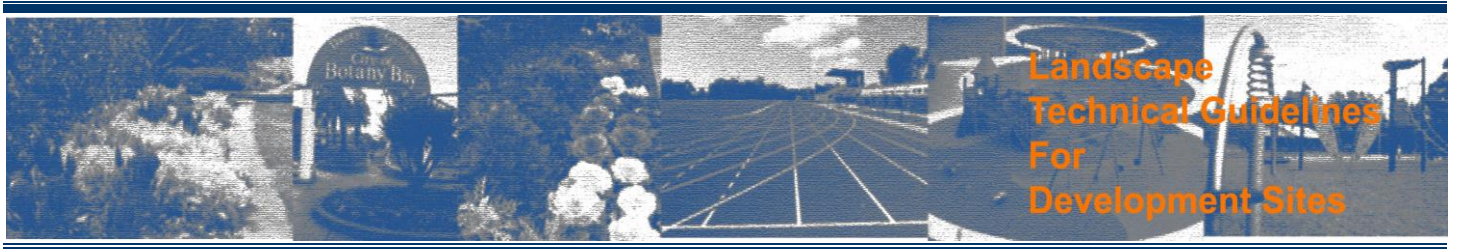
All work undertaken shall comply with the NSW *Occupational Health and Safety Act*.

4.12 Retaining and Masonry Walls

Retaining walls should be constructed of masonry or concrete. Block and brick walls must be rendered or have a suitable decorative finish or render applied. Treated pine or hardwood sleeper retaining walls are only suitable for detached residential dwellings and are generally not permissible in industrial or commercial sites or at the street boundary.

Large retaining walls greater than 500mm in height are required to be designed by a Structural Engineer and indicated in the Landscape Documentation. All wall drainage outlets are to be screened with filter fabric and runoff disposed of in accordance with Council policy. Drainage aggregate layers are required behind the wall as is waterproofing.

Footings are to be designed to accommodate tree roots.



4.13 Utilities (electrical and fire)

If an electrical kiosk or substation is required it must be located in an unobtrusive location away from vehicle and pedestrian entrances to the property and preferably toward a side boundary and/or setback off the street boundary to enable screening (planting or structures) and maintenance of streetscape amenity. The location of and screening treatment surrounding the utility must be approved by Council's Landscape Architect prior installation.

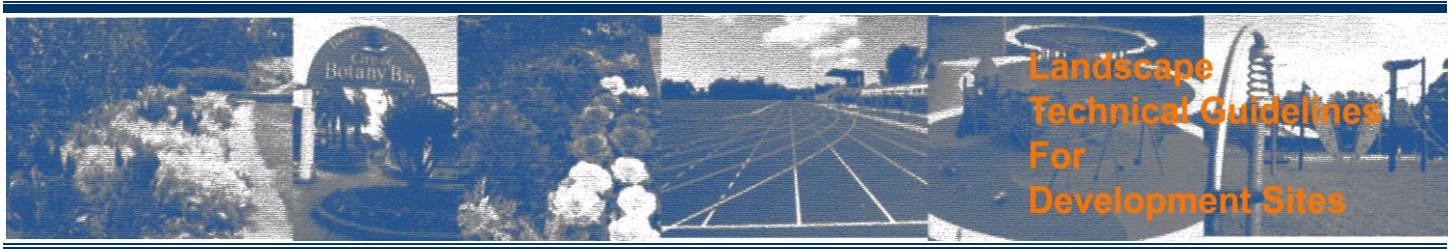
Fire booster valve assemblies should be housed within the external face of the building structure, otherwise screened from view from public domain such as located near side boundaries, behind boundary walls, within an enclosure or screened by landscaping.

Where the street electrical powers line are to be undergrounded, locate new public footpaths away from site boundaries to accommodate service pillars in a planted strip.

4.14 Wheel Stops

Wheel stops are required where car-parking spaces abut landscaped areas and planter beds. They shall be located in accordance with Australian Standards (AS 2890.1 and 2) and **Part 3A - Car Parking** of the DCP.

Timber stops are not permitted.



5. Landscape Soft Works

5.1 Existing Vegetation

The Bayside values trees. With increasing urbanisation and the development /construction process, the protection of trees is an important issue for Council. Consideration must be given to existing trees early during site planning to incorporate existing trees into a development.

Council expects the retention of healthy and/or functional trees and requires that a development proposal be designed to minimize tree removal or impact and ensure that the health of trees to be retained is not compromised by buildings, car parks, driveways, ancillary building, pools, pavements or the location of underground utilities.

When assessing whether existing trees should be retained, Council considers various factors such as location, amenity (visual, environmental), function, health, form and structure, useful life, wildlife habitat and significance of the tree as well as impact on the development if retained and whether alternative site layouts need to be considered (refer to AS 4970-2009 – Protection of trees on development sites for further information).

Council may require an independent Arborist's report prior to the determination of a development application.

Council will only approve removal of a tree if the tree is in poor or declining condition, is hazardous or has a minimal safe useful life expectancy or if it can be shown that it is not possible to provide an alternative layout or design to allow retention of the tree as it would render the development economically unviable.

It is the developer's responsibility to ensure that new buildings or structures are located the required distances away from existing trees. Council will generally not permit the removal of healthy trees nor the pruning of tree canopies to accommodate a new building or the increase in height of a building.

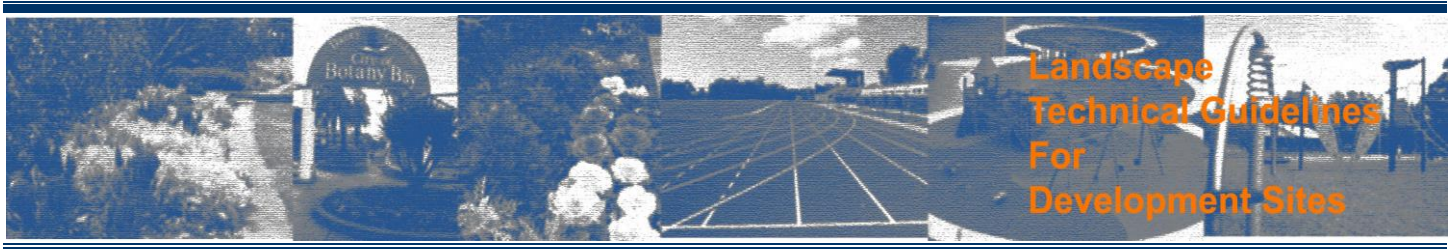
Refer to **Part 3F - Tree Management** of the DCP further requirements.

5.2 Protection of Existing Trees

Protective measures both before and during construction are required of all existing trees to be retained on a development site.

At site establishment, and prior to any works occurring including demolition, trees are to be physically protected with a temporary fence. Fencing must be located underneath the canopy drip line as far as possible. Larger areas may be required for significant trees. The fence is to remain in place until practical completion of all construction work. For trees where fencing under the dripline is not possible trees, trunks and lower branches are to be protected with carpet underlay or similar and lengths of timber secured by wire. Refer to the conditions of approval.

There is to be no activity within the fenced off tree protection zone. Natural ground level shall be maintained. Site sheds, stockpiles, storage, cleaning of tools/machinery and parking shall be located remotely from all protected trees. Trenching for underground services is generally not permitted nor is overhead electrical service wires. Notices are to be posted on the protective fencing indicating that it is a tree protection area and a notice placed in the site manager's office with contact details for the Arborist.



The Soil and Water Management Plan is required to show all existing trees to be retained and measures to be undertaken to enable their preservation. Sediment fencing and dish drains shall not be located within the dripline.

The Hydraulics Design Engineer is required to account for existing trees to be retained during stormwater design (storage and disposal) on any site. Sub-surface storage tanks, infiltration trenches and stormwater pits and pipes are not permitted within the dripline of any existing tree or within a 2-3 metre radius outward of the dripline to enable preservation of the root system.

Where building work or trenching is unavoidable within the fenced tree protection zone work shall be undertaken manually and supervised by an Arborist. Exposed roots shall be protected by hessian and a layer of mulch.

Where a masonry boundary fence may impact or conflict with tree roots, a pier and beam or bridged footing will be required. Strip or trench footings will not be permitted.

Retaining walls or changes in level are not permitted near existing trees. Areas of new paving should be kept several metres away from tree trunks to prevent root compaction and loss of aeration and water penetration to tree roots and minimise later pavement damage.

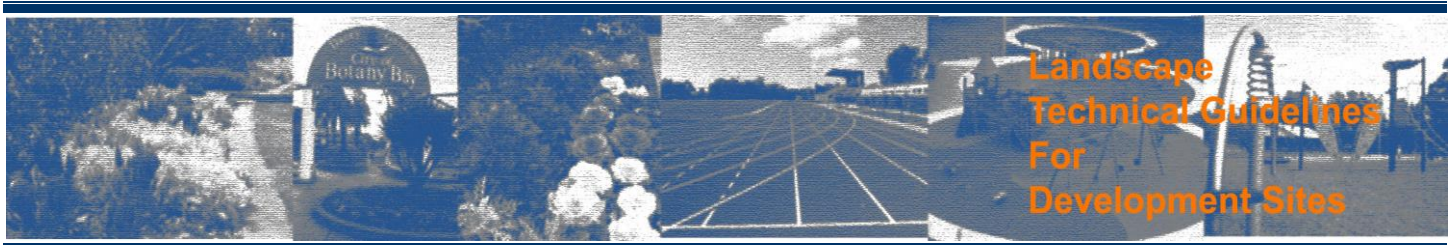
Refer to AS 4970-2009 – Protection of trees on development sites for further information and **Part 3F - Tree Management** of the DCP 2013 for further Council requirements.

5.3 Water Sensitive Urban Design (WSUD) / Site Responsive Stormwater Design

WSUD is about the integration of water cycle management into urban planning and design. It involves the planning and design of urban environments (new or retro-fitted) that supports healthy ecosystems through water management. Some of WSUD aims are:

- Protect water quality (surface and ground water);
- Improve the quality of water discharge to the natural environment;
- Incorporate collection and re-use of runoff - roofwater and stormwater;
- Reduce run-off and peak flows due to urban development;
- Enhance social amenity in urban areas through the use of multi-purpose greenspace - integration of landscape and water; and
- Minimise drainage infrastructure costs.

(Source: The National Water Commission).



In relation to landscape practices, runoff discharge and volume to the stormwater system can be minimised by:

- Permeable pavement materials;
- Reduced amounts or expanses of impervious pavements and surfaces;
- Directing runoff to garden beds rather than to the street or stormwater systems through grading of paved areas;
- Harvesting roof rainwater in tanks for irrigation re-use;
- Minimising underground drainage by using bio-swales, wetlands, infiltration trenches or subsoil collection for stormwater disposal and re-use; and
- Optimising deep soil zones for stormwater and runoff water infiltration, thereby irrigating planted areas and recharging the groundwater aquifer.

The use of potable water in irrigation can be minimised by:

- Reducing the need for irrigation through appropriate plant selection and hydrozoning (grouping plants of similar water needs together).
- Using water efficient irrigation systems (drip);
- Mulching to retain soil moisture.
- Less lawns.
- Enhanced soil porosity and soil water retention through the use of soil improvement and water retention soil additives; and
- Draining and grading paved areas to garden beds

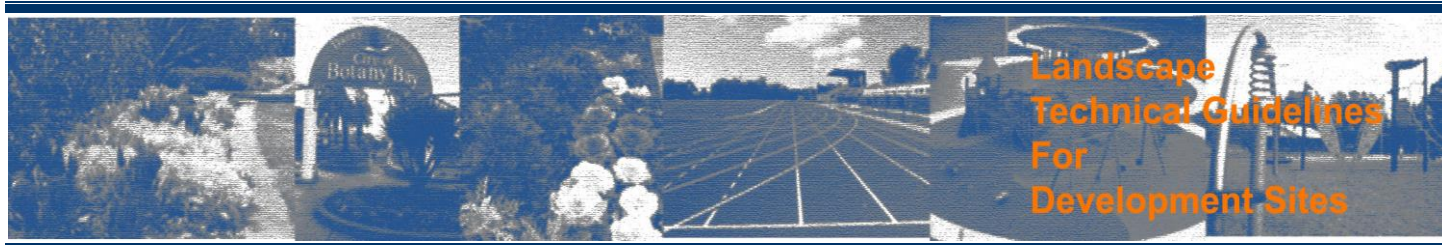
For further information and requirements refer to Council's **Stormwater Management Technical Guidelines** and **Part 3G - Stormwater Management** of the DCP.

5.4 Irrigation

The use of recycled water from rainwater tanks is recommended across all developments.

Irrigation must comply with Sydney Water requirements and regulations. Watering systems are to be designed and installed by a qualified irrigation consultant and should be specific to plant needs and soil type. Water saving devices such as rainfall/moisture, temperature and wind sensors should be incorporated into the design. Drip irrigation systems are more efficient. The system needs to ensure sufficient coverage of planted and lawn areas as well as individual trees and attention must be paid to ensure there is no overspray onto paved areas resulting in runoff and water wastage.

Planting techniques such as hydrozoning, organic mulches and appropriate plant selection should be incorporated into the landscape design to reduce watering and irrigation. Other actions to consider to reduce reliance on irrigation and enhance stormwater infiltration are described above in 4.3. Employ WSUD techniques wherever possible, even in small scale developments.



5.5 Natives and Indigenous Vegetation

Generally, native plants are recommended in a planting scheme with 70% to 80% of the planting palette being native species. Selected indigenous natives may be included where appropriate and suitable to the non-natural site conditions.

If using locally native, or Indigenous species, species must be selected that are suitable to site conditions. Most developed sites impart environmental and growing conditions drastically altered from the natural conditions that these plants usually favour. For example, soils are imported, adequate solar access may not be available, locations are exposed, local temperatures increased due to pavements and buildings next to planted areas, planters are irrigated rather than relying on rainfall and drainage not natural.

A detailed knowledge of the site conditions required by individual indigenous species is required prior to using them in a planting design as it may lead to failure of the planting scheme or planting not meeting the objectives of the landscape design.

Where locally native species are used, purchase plants from a nursery propagating from locally collected seed, arrange plants in islands rather than strips or single specimens, keep lawns away, use organic low nutrient mulches, avoid fertilisers, chemicals and irrigation and use the plants where they can grow naturally without mowing, hedging or whipper snipping. Maintain natural (deep soil) drainage conditions on the site where possible.

5.6 Soil Improvement and Fertilisers

Botany's soils are generally sandy with poor water and nutrient holding capacity. Soil should be improved with suitable composts, soil conditioners and manures applied at the manufacturer's recommended rates, blending into the subgrade to 200mm (refer to AS 4454:1999 - Compost, soil conditioners and mulches). Recycled and organic composts and soil conditioners are recommended. When growing locally native (indigenous) species it is recommended the natural soil be unaltered or improved with suitable additives only.

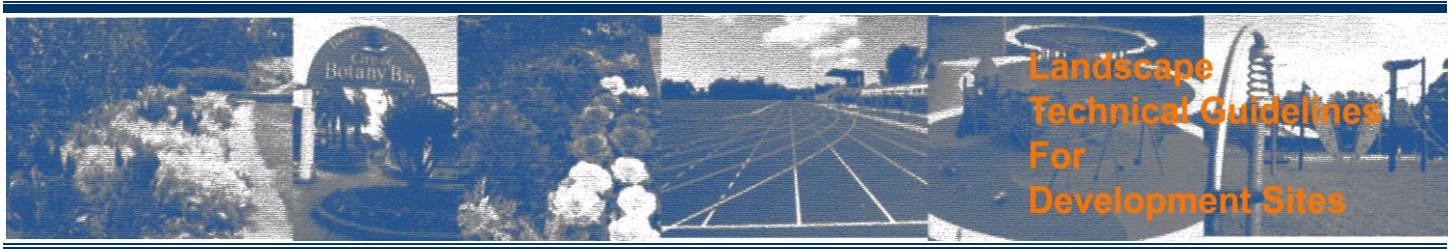
The use of fertilisers should be minimised to reduce nutrient loadings on the stormwater system. Most natives do not require fertiliser. Organic fertilisers are recommended. Water retention additives are recommended to enhance the water holding properties of the soil during plant establishment.

Aerate compacted soils and correct the pH of soils affected by construction activities or prior land uses. Remove builder's debris, concrete, cement and other deleterious matter from areas to be landscaped prior to planting.

5.7 Mulch

Use only mulch that is certified weed free and meets AS 4454. Mulch to a minimum depth of 75mm keeping clear of stems.

For trees in grass, mulch in a 1 metre radius from the tree trunk and to a depth of 100mm. Check mulch placement/gradient to ensure it cannot be washed into drains – retaining edges will be required in this case.



Recycled organic mulches are recommended - are a mixture of green and wood waste that decompose over time adding nutrients to the soil. Other acceptable mulches are brush chippings, leaf litter mulches and pine bark (plantation timber by-product only).

Gravel is not a suitable mulch in garden beds as it is inorganic and does not add nutrients to the soil. Their use should be restricted to ancillary, utility or service areas.

Synthetic weed control matting laid between soil and mulch layers is not permitted as it greatly reduces soil aeration and moisture penetration. Organic mulches that are topped up regularly to ensure 75-100mm depth is recommended to reduce weed growth.

5.8 Imported Landscape Soils

Imported soils for landscaped areas shall be in accordance with AS4419:1998 – Soils for Landscaping and Garden Use. Recycled soils and garden mixes are recommended. Soil mixes for planter boxes on podium or roof gardens shall be light, free draining and recommended for this particular application. A more specific mix may be required for roof gardens.

5.9 Lawns and Turf Grass

Lawns should be practical dimensions and adequate for their purpose and have a maximum gradient of 1 in 4. Lawns are generally unsuitable and not recommended in industrial and commercial developments as a dense landscape planting scheme will be required to screen and soften buildings and external at grade parking and circulation areas. Hydroseeding is only permitted for stabilising stockpiles or loose material on batters.

5.10 Root Control Barriers

Strip polyethylene tree root barriers (rigid ultra durable high density polyethylene (HDPE)) is recommended for trees planted adjacent to or within paved areas to reduce the likelihood of pavements lifting or buckling with certain tree species.

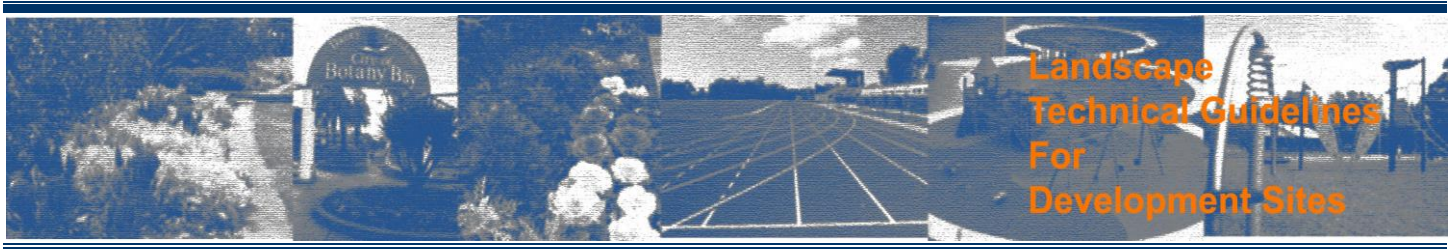
The barrier should be laid 900mm deep in 6 metre lengths (minimum) either side of the tree trunk or around the perimeter of the planting hole for pits trees in paved areas. The top edge of the barrier shall finish approx. 20mm below the soil or adjoining surfaces. Where necessary cut the barrier to fit around underground services, seal to prevent root penetration in accordance with manufacturer's recommendations.

Root directors are only suitable for trees in tree pits in paved areas and should have vertical ribs on the inside, be installed not less than 450mm deep and joints sealed to prevent root penetration in accordance with manufacturer's recommendations. Allow a 100mm column of aggregate between the tree planting hole and reverse of barrier.

5.11 Landscaping on Development Sites

Sufficient trees and landscaping is to be incorporated into a planting design so that they:

- Adequately soften and subdue the built form and façade of a building and reduce its visual impact;
- Blend new development into and complement the streetscape, provide a transition and integrate buildings with landscaping;



- Enhance street presentation of industrial developments;
- Reduce the scale and bulk of the building envelope or development;
- Provide buffers at interfaces between development types;
- Increase canopy cover to the site and encourage green corridors;
- Provide an appropriate scale for amenity and liveability/useability in open spaces and pedestrian areas;
- Provide screening and privacy where needed;
- Allow visual surveillance of the street and active street frontages where applicable (this shall not preclude landscaping or tree planting in setbacks but success will rely on the use of selected appropriate trees and shrubs); and
- Green car parks (refer **Part 3L - Landscaping** of the DCP).

Plant selection shall:

- Be appropriate and suitable for the landscape design intent;
- Suit the soils and microclimatic conditions on the site i.e. shade, exposure, irrigation etc; and
- Be site responsive - enhance and embellish open spaces, setbacks and pedestrian areas, provide screening and shade where needed, alleviate large carpark and paving expanses, subdue buildings and so on.

All trees in a proposed landscape design shall be super advanced, of no less than 75-100 litre container size, at least 2.4 metres in height and with a calliper of 45mm at 300mm above ground level. Where entry statements are required or for public domain plantings, larger trees may be required by Council – 100 to 400 litres. For detached residential dwellings 45 litre trees may be specified unless replacement trees are required, in which case the size will be stipulated by Council. For street trees refer to **Planting in the Public Domain** below.

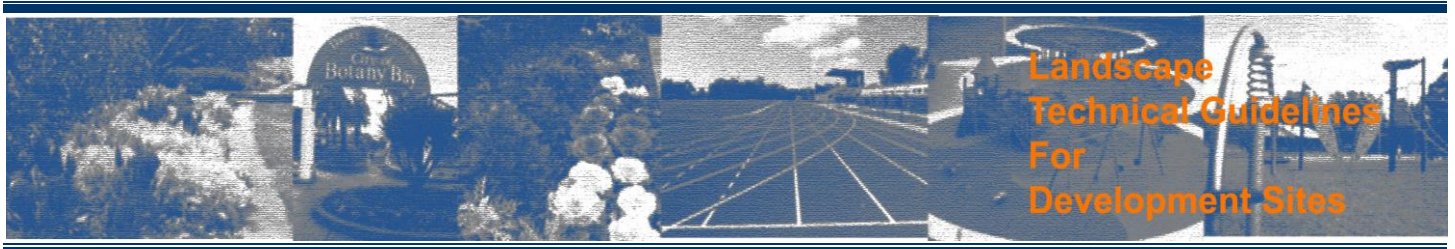
Shrubs shall be in no less than 5 litres or 200mm pot size. Larger shrubs required for screening, privacy, hedging or as feature specimens should be 12-25 litres in size. Mass planted areas of native grasses or indigenous species may include tube stock.

Supply plants to the quality and standards recommended in “Specifying Trees” by Ross Clark. Ensure plant material is hardened off ready for planting.

Recommended planting densities/ratios per square metre for shrubs and groundcovers are provided in the table below. Native or decorative grasses in virocells or tubes should be spaced according to the recommendations of the supplier.

Trees should be planted densely whilst ensuring the mature canopies are not overcrowded. Use the features and form of individual species to reduce the scale, height and bulk of buildings and for screening and softening of buildings and other site elements.

Large trees should not be planted within several metres of property boundary fences to avoid future neighbour conflicts, which often results in the loss of significant trees or parts of them in later years. Large trees should be planted several metres away from footings or have root barriers for the full depth of the footing. Root barriers are recommended for larger tree species planted within paved areas.



The Landscape Consultant engaged must consider the likely mature height and canopy spread of each selected tree for the Botany area as many trees will not attain their natural height or canopy potential due to the local soils. This may necessitate a greater density of tree planting in the proposal.

Recommended Plant Centres/Spacing (mm)	Number of Plants per Square Metre (rounded)
100	100
150	45
200	25
250	16
300	11
350	8
400	6
500	4
750	2
1000	1

5.12 Planter Bed Sizes

The minimum width for planter beds in all developments is 1 metre, except where otherwise stipulated in boundary setbacks for each development type.

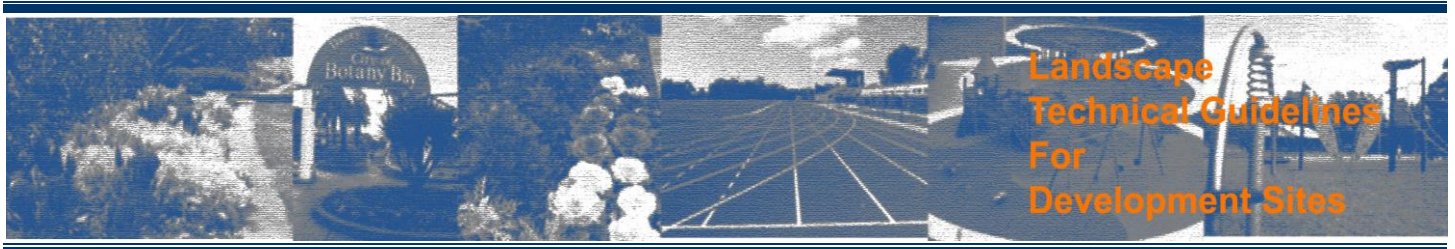
Landscape areas containing trees should be at least 3 metres in width and length, the area increasing incrementally with the mature height or size of the tree. This will reduce the need for pruning trees near buildings at a later date.

5.13 Planting in the Public Domain

Council requires most developers provide street tree planting or street landscaping as a contribution to the streetscape and public domain as a component of the development to soften the development and alleviate or subdue its impact upon the streetscape.

Street landscaping should be designed alongside site landscaping to ensure integration of the development into the streetscape, taking into consideration existing planting in the street. Landscaping and street tree species shall be in accordance with Council's Street Tree Plan which nominates a particular species of tree for each street in the LGA.

All street tree or street landscaping is to be included in the landscape documentation for approval by Council. All work will be at the applicant's expense. Developers will also be required to replace the grass on the nature strip if required once construction is complete.



The minimum size requirement for street trees is 1.8 metres in height. Container size shall be a minimum of 100 litres. Larger street trees (100-400 litres) may be required in some locations, for example, if there are existing mature trees adjoining the site, if it is a replacement tree, if screening is required or if the scale of the development (height and bulk) warrants it. The location of awnings and tree species must be considered.

Street trees are to be single trunked and with a strong leader. A water retention additive is to be incorporated into the backfill mixture to assist soil moisture retention. Most trees are required to be double staked with 2600 x 50 x 50mm hardwood stakes, tied to the tree with a hessian tie in a figure-of-8. A root irrigation system is also required to facilitate water reaching the rootball. This shall be a circular ag. pipe type system with outlet above mulch level.

Street trees installed in tree pits in paved footpaths may require tree guards and the surface level of the pit is to be finished in accordance with Council specifications such as a resin bound porous aggregate or similar. Other inclusions may also be required such as structural cell or structural soils.

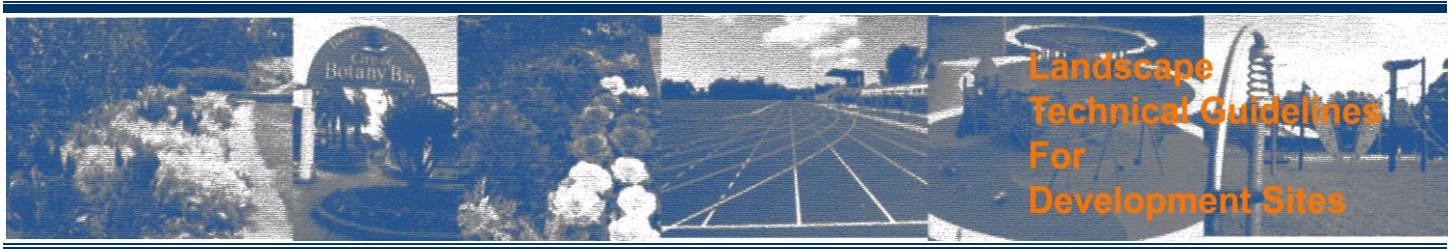
5.14 Energy Efficient and Ecologically Sustainable Landscaping Practices

Energy efficient and sustainable landscaping practices should be incorporated when designing, installing and maintaining landscapes (refer to **Figure 1** and **Figure 2**). The placement of vegetation can improve the thermal performance of buildings, minimise the costs of heating and cooling and can have a significant impact on the comfort of outdoor recreation spaces. Vegetation can affect the seasonal variations in solar access, act as windbreaks and channel breezes. Trees can reduce heat gain through windows by 40-80%. A 2 metre high pergola against the northern wall of a building covered with vines can also reduce heat gain by up to 80%. Evergreen tree rows used to deflect winter winds can reduce the energy used in heating a home.

The following guidelines can assist an energy efficient landscape design:

- Permit solar access to windows, solar panels, living areas and drying areas in winter and shade buildings and outdoor spaces in summer through the appropriate selection and location of trees and plants. Use broad canopied evergreen trees and vines to provide shade in summer and light canopied or deciduous trees for winter solar access. Winter and summer sun angles and mature tree heights and canopy spreads should be considered’;
- Outdoor recreation spaces should be located on the northern side of buildings where possible to maximise solar access and cooling summer breezes. Trees here could be evergreen with light canopies or deciduous to allow winter solar penetration but consider also trees for summer shade;
- Outdoor spaces on the western side of buildings should contain broad canopied evergreen trees for summer shading and to buffer cold winter winds;
- Outdoor spaces on the southern side of buildings can be planted with a row of trees to act as a windbreak;
- Vines, pergolas and shrubs can provide insulate and cool buildings. Tall bushy shrubs or small canopy trees on the western side of buildings can intercept the low angled afternoon summer sun; and
- Broad canopied trees greatly reduce glare and heat and provide shade in car parks and vehicle circulation areas where there are large expanses of paving. Also, minimise the amount of hard surfaces to reduce heat reflection and glare and reduce water run-off. Trees adjacent to patios and pools reduce heat and glare.

Sustainable development principles can be incorporated into the design and installation of landscapes. The basic principles of ESD are to minimise the consumption of resources particularly non-renewables, preserve



the environment, protect biodiversity, maintain natural ecological processes, reduce greenhouse gas emissions and pollution, foster sustainable industries by selecting environmentally sensible construction materials and minimise impacts on stormwater, water supply and energy consumption.

- Preserve existing trees and incorporate into the site layout;
- The plant palette should show a dominance of Australian native species, including indigenous species where appropriate (ideally planted in a specific area set aside for this purpose). These enhance local biodiversity and use less water. Select lawns that use less water or preferably replace with groundcovers, shrubs or small areas of gravel;
- Use certified AS mulches and composts. Mulch conserves up to 70% of water that is normally evaporated;
- Use landscape materials that originate from renewable and sustainable sources and are long lasting. Give preference to materials that have undergone minimal processing and are not collected from nature;
- Buy local to reduce the energy used in transport;
- Use recycled materials - concrete, paving sand, sandstone, aggregates and gravels, mulches, composts and soils, crushed tile, pavers and timber made from recycled plastic;
- Intercept and return irrigation and stormwater runoff to the groundwater aquifer with porous pavements, less hard paving, grading of paved areas to landscaped areas, rain gardens and bio-swales;
- Irrigate from a recycled water source. Use drip systems, rainfall, moisture, temperature and wind gauges and sensors as well as irrigation controllers, zoning and timers. Design irrigation according to plant types. Restrict the use of potable water for irrigation;
- Use plant species with low maintenance requirements (fertilisers, power maintenance equipment, irrigation, pesticides, herbicides);
- Purchase timber from sustainable (renewable) plantations, use mulches made from recycled materials;
- Design landscaping to enhance biodiversity, wildlife corridors and habitat for native species;
- Incorporate planted stormwater detention basins, bio-swales, rain gardens and stormwater collection and recycling facilities;
- Use integrated pest and weed management techniques and preferably, select pest and disease resistant plants (native); and
- Re-use organic waste on site. Approved cleared vegetation can be chipped, mulched or composted (except weeds). Stockpile excavated materials and site topsoil and re-use on site.

Figure 1 - Evergreen Trees for Solar Access Control

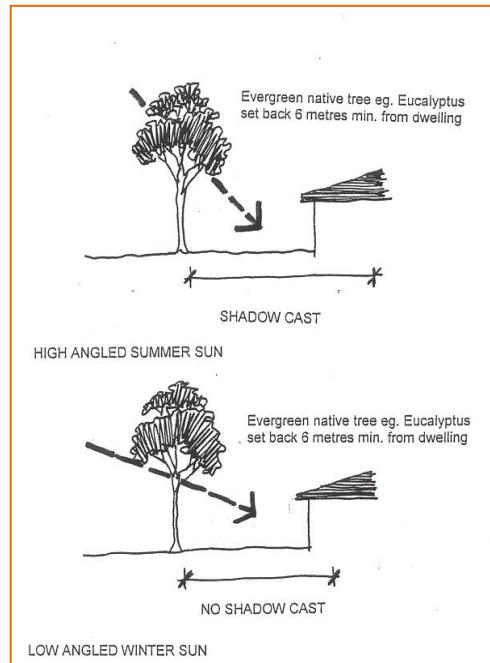
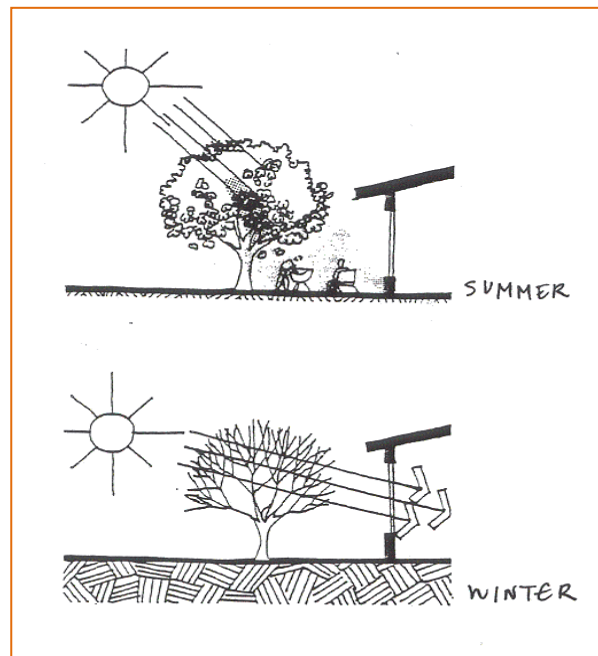
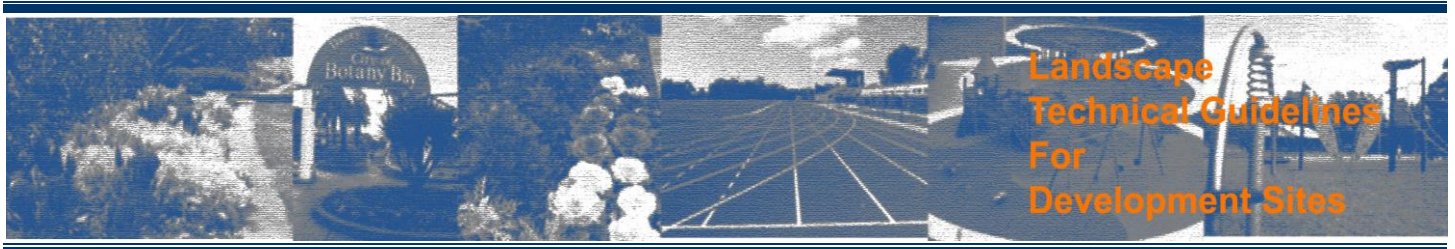


Figure 2 - Deciduous Trees for Solar Access Control





Appendix 1 - Plant Species Known to Grow Well in the Botany Bay Area

The following is a list of plant species and varieties that are known to generally grow well in the Botany Bay area. Each species has particular growing conditions and growth habits and should be selected on that basis. The list is not exhaustive and should not limit nor restrict the selective use of other appropriate plant material.

The dominance of native species reflects the preference for plant material that is suited to the area and relatively low maintenance. This is particularly important in landscape schemes that will receive only periodic maintenance.

At least 70% - 80% of a planting scheme is required to be native species.

Table 1 - Large Canopy Trees (over 15 metres)

Botanical Name	Common Name	Approx. mature height	Type
<i>Angophora costata</i>	Sydney Red Gum	15-20m	native
<i>Corymbia citriodora</i>	Lemon Scented Gum	20-25m	native
<i>Eucalyptus maculata</i>	Spotted Gum	20m	native
<i>Eucalyptus microcorys</i>	Tallowwood	25m	native
<i>Eucalyptus saligna</i>	Sydney Blue Gum	30m	native
<i>Lophostemon confertus</i>	Queensland Brush Box	12-15m	native
<i>Melaleuca quinquenervia</i>	Broad Leaved Paperbark	15m	native

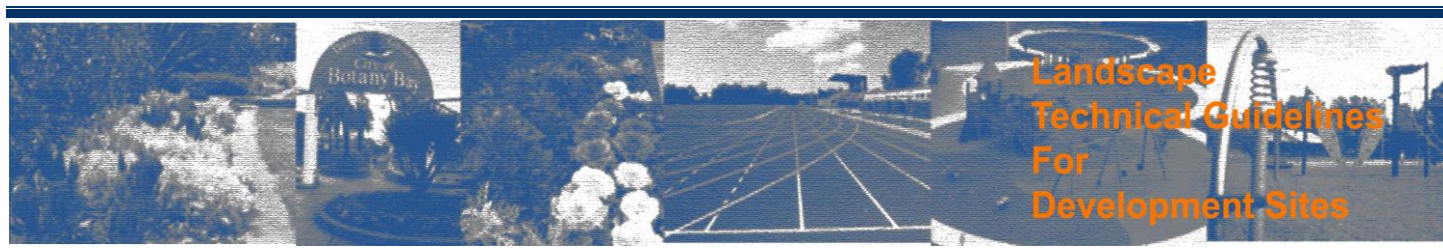


Table 2 - Medium Canopy Trees (7 to 15 metres)

Botanical Name	Common Name	Approx. height	Type
<i>Acmena smithii</i>	Lillypilly	8m	native
<i>Banksia integrifolia</i>	Coast Banksia	8-12m	native
<i>Callistemon salignus</i>	Willow Bottlebrush	7m	native
<i>Corymbia gummifera</i>	Red Bloodwood	10m	native
<i>Cupaniopsis anacardioides</i>	Tuckeroo	8m	native
<i>Elaeocarpus reticulatus</i>	Blueberry Ash	6-8m	native
<i>Eucalyptus haemastoma</i>	Scribbly Gum	10-12m	native
<i>Eucalyptus nicholii</i>	Willow Peppermint	8-12m	native
<i>Eucalyptus scoparia</i>	Wallangarra White Gum	9-12m	native
<i>Ficus rubiginosa</i>	Port Jackson Fig	12-15m	native
<i>Jacaranda mimosaeifolia</i>	Jacaranda	10-15m	exotic, deciduous
<i>Metrosideros excelsa</i>	Pohutukawa	8m	exotic
<i>Podocarpus elatus</i>	Illawarra Plum	8m	native
<i>Pyrus spp.</i>	Ornamental pears	7-10m	exotic, deciduous
<i>Sapium sebiferum</i>	Chinese Tallow Tree	8m	exotic, deciduous
<i>Syzygium paniculatum</i>	Magenta Cherry	8-10m	native
<i>Ulmus parvifolia</i>	Chinese Elm	8-10m	exotic, deciduous
<i>Waterhousia floribunda</i>	Weeping LillyPilly	7-10m	native

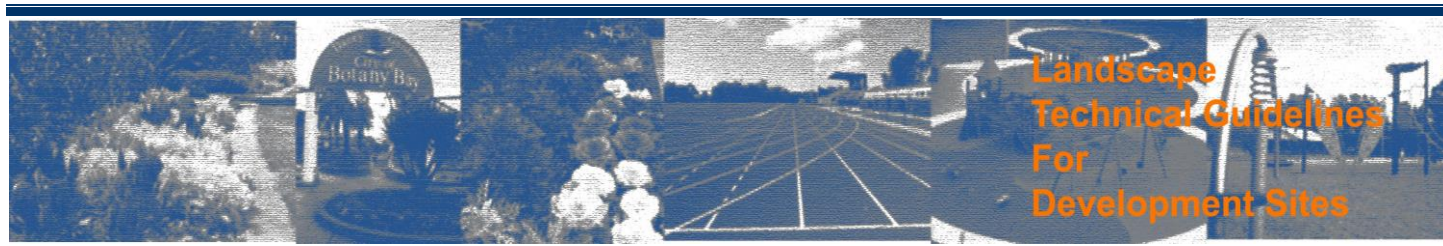


Table 3 - Small Trees (less than 7 metres)

Botanical name	Common Name	Approx. height	Type
<i>Acmena smithii</i> `Minor'	Compact LillyPilly	6m	native
<i>Angophora hispida</i>	Scrub/Dwarf Apple	5m	native
<i>Banksia serrata</i> <i>Banksia aemula</i>	Old Man Banksia Wallum Banksia	Variable, up to 8- 10m	native
<i>Bauhinia variegata</i>	Pink Orchid Tree	6m	exotic
<i>Callistemon</i> `Harkness', `Hannah Ray', <i>C.citrinus</i>	Bottlebrush	4-5m	native
<i>Ceratopetalum gummiferum</i>	NSW Christmas Bush	5m	native
<i>Corymbia X Summer Red/Beauty etc</i>	Grafted Eucalypt	5m	native hybrid
<i>Fraxinus griffithii</i>	Evergreen Ash	5m	exotic
<i>Glochidion ferdinandii</i>	Cheese Tree	6m	native
<i>Harpullia pendula</i>	Tulipwood	6-8m	native
<i>Hibiscus tiliaceus/rubra</i>	Cottonwood	5-7m	native
<i>Hymenosporum flavum</i>	Native Frangipanni	7m	native
<i>Lagerstroemia indica/hybrids</i>	Crepe Myrtle	3-6m	exotic, deciduous
<i>Magnolia Little Gem, Exmouth</i>	Dwarf Magnolia	4-8m	exotic
<i>Melaleuca bracteata</i>	Black Tea Tree	4-5m	native
<i>Stenocarpus sinuatus</i>	Firewheel Tree	6-10m	native
<i>Syzygium paniculatum Dwarf Syzygium leuhmannii</i>	Dwarf Lillypilly Riberry	5-7m	native
<i>Tristaniopsis laurina</i>	Water Gum	6-12m	native

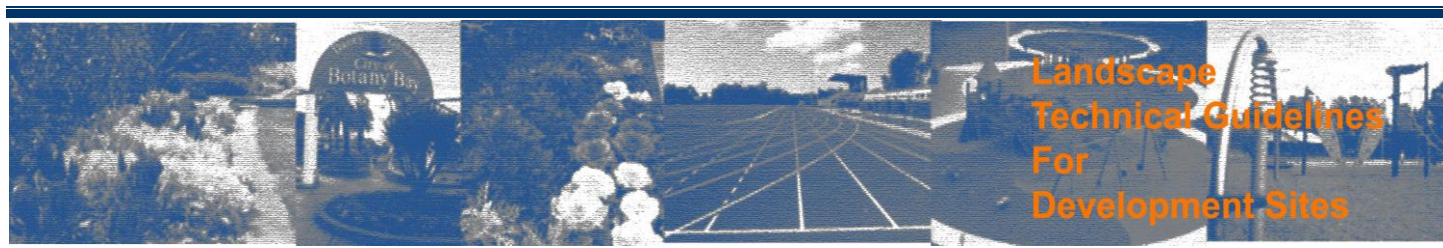


Table 4 - Medium-Tall Screening Shrubs (1.5 to 4 metres)

Botanical name	Common Name	Approx. height	Type
<i>Banksia ericifolia</i> <i>Banksia spinulosa</i>	Heath Banksia Hair Pin Banksia	3m	native
<i>Callistemon</i> `Captain Cook`, `Endeavour`	Bottlebrush	1-2m	native
<i>Dodonaea viscosa Purpurea</i>	Purple Hop Bush	4-5m	native
<i>Grevillea</i> `Moonlight`, `Sandra Gordon`, <i>G.hookeriana</i>		3-4m	natives
<i>Grevillea</i> `Coastal Glow`, `Misty Pink`		2-3m	native hybrids
<i>Grevillea</i> `Canberra Gem`, `Superb`, `Ned Kelly`		1.5-2m	native hybrids
<i>Kunzea ambigua</i>	Tick Bush	2m	native
<i>Leptospermum petersonii</i>	Lemon Scented Tea Tree	4m	native

Table 5 - Medium/ Hedging Shrubs (1 to 3 metres)

Botanical name	Common Name	Approx. height	Type
<i>Eriostemon</i> spp.	Wax Flower	1-2m	native
<i>Grevillea rosmarinifolia</i>	Rosemary Grevillea	1-1.5m	native
<i>Hebe</i> spp.	Hebe	0.5-1m	exotic
<i>Metrosideros</i> cultivars	Dwarf NZ Christmas Bush	0.5-3m	exotic
<i>Murraya paniculata</i>	Cosmetic Bark Tree	Up to 4m or hedged	exotic
<i>Syzygium</i> cultivars eg Blaze, Aussie series, Select, Resilience, Hot Flush, Cascade etc	Dwarf Lillypilly	1-4m	native
<i>Westringia fruticosa</i>	Coastal Rosemary	1-2m	native

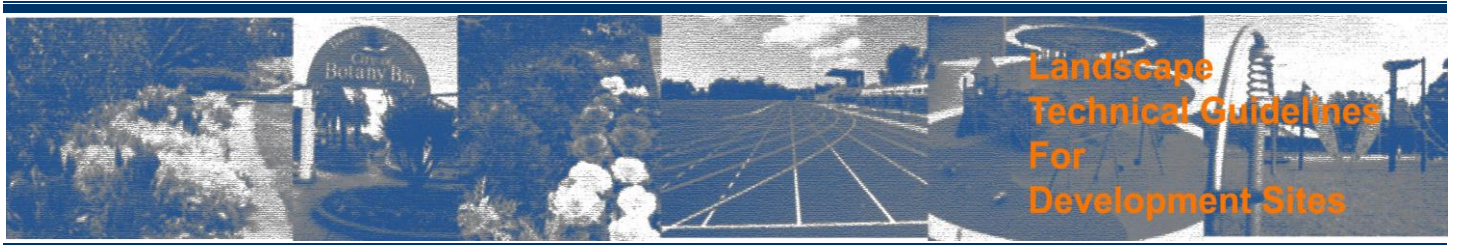


Table 6 - Small Shrubs and Specimen or Feature Plants

Botanical name	Common Name	Approx. height	Type
<i>Callistemon 'Little John', 'Anzac'</i>	Bottlebrush	0.5-1.5m	native
<i>Cordyline</i>	Cordyline	0.5-2m	native
<i>Coleonema pulchrum</i>	Pink Diosma	1m	native
<i>Dianella</i>	Flax Lily	0.5m	native
<i>Doryanthes excelsa</i>	Gynea Lily	1.5m	native
<i>Liriope muscari</i>	Lily Turf	0.5m	exotic
<i>Lomandra longifolia & cultivars</i>	Mat Rush	0.5-1m	native
<i>Melaleuca 'Claret Tops'</i>		1m	native
<i>Nandina 'Nana'</i>	Dwarf Sacred Bamboo	0.5m	exotic
<i>Phormium cultivars</i>	Flax	0.5- 2m	exotic
<i>Strelizia spp.</i>	Bird of Paradise	1.5-3m	exotic

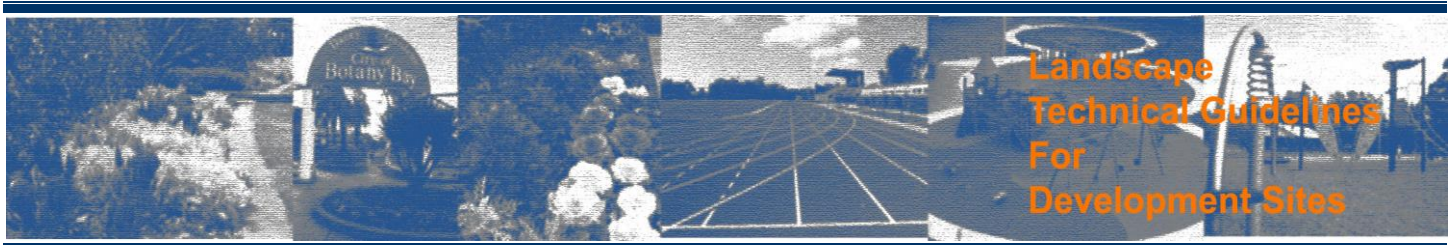
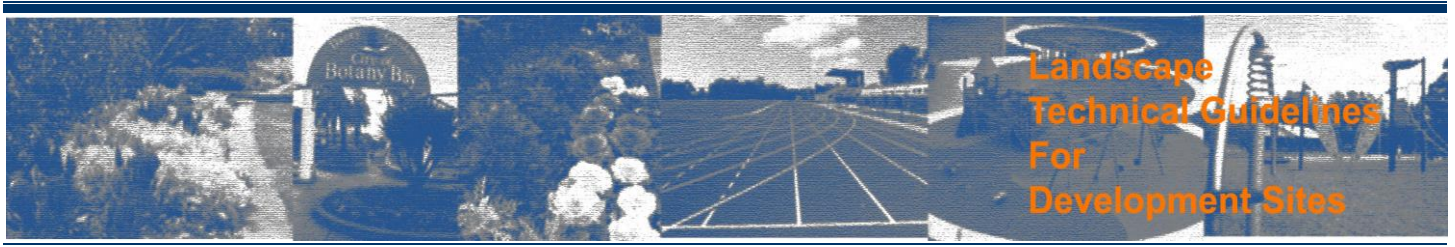


Table 7 - Ground Covers and Climber

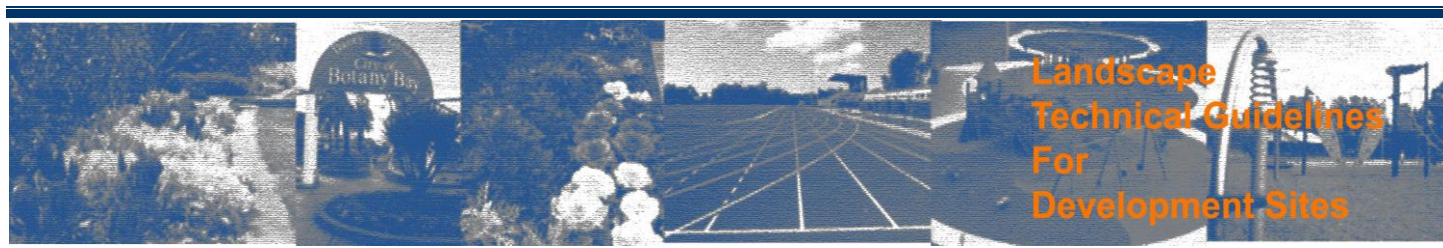
Botanical name	Common Name	Approx. height	Type
Ornamental grasses such as <i>Pennisetum</i> , <i>Poa</i> , <i>Isolepis</i> , <i>Danthonia</i> , <i>Themeda</i> , <i>Stipa</i>		Up to 1m	native
<i>Ajuga spp.</i>	Carpet Bugle	g/cover	native
<i>Brachycome multifida</i>	Native Field Daisy	g/cover	native
<i>Carpobrotus glaucescens</i>	Pigface	g/cover	native
<i>Convolvulus mauritanicus</i>	Moroccan Glory Bind	g/cover	exotic
<i>Gazania</i>		g/cover	exotic
<i>Grevillea 'Poorinda Royal Mantle'</i> / <i>gaudichaudi</i>		g/cover	native
<i>Hardenbergia violacea</i>	False Sarsparilla	low climber	native
<i>Hibbertia scandens</i>	Twining Guinea Flower	g/cover or climber	native
<i>Pandorea spp.</i>	Bower of Beauty	Climber	native
<i>Myoporum parvifolium</i>	Creeping Boobialla	g/cover	native
<i>Trachelospermum jasminoides</i>	Chinese Star Jasmine	climber or g/cover	exotic



Appendix 2 - Indigenous Species

The Eastern Suburbs Banksia Scrub (ESBS) in the Sydney Basin Bioregion is characterised by the following assemblage of species

- *Acacia longifolia*
- *Acacia suaveolens*
- *Acacia terminalis*
- *Acacia ulicifolia*
- *Actinotus helianthii*
- *Actinotus minor*
- *Allocasuarina distyla*
- *Astroloma pinifolium*
- *Baeckaea imbricata*
- *Banksia aemula*
- *Banksia ericifolia*
- *Banksia integrifolia*
- *Banksia serrata*
- *Bauera rubioides*
- *Billardiera scandens*
- *Boronia parvifolia*
- *Bossiaea heterophylla*
- *Bossiaea scolopendria*
- *Brachyloma daphnoides*
- *Caustis pentandra*
- *Conospermum taxifolium*
- *Cyathochaeta diandra*
- *Darwinia fascicularis*
- *Darwinia leptantha*
- *Dianella revoluta*
- *Dichelachne crinita*
- *Dillwynia retorta*
- *Epacris longiflora*
- *Epacris microphylla*
- *Epacris obtusifolia*
- *Eragrostis brownii*
- *Eriostemon australasius*
- *Eucalyptus gummifera*
- *Gonocarpus teucrioides*
- *Haemodorum planifolium*
- *Hakea teretifolia*
- *Hardenbergia violacea*
- *Hibbertia fasciculata*
- *Hypolaena fastigiata*
- *Kunzea ambigua*
- *Lambertia formosa*
- *Lepidosperma laterale*
- *Leptocarpus tenax*
- *Leptospermum laevigatum*
- *Leptospermum trinervium*
- *Lepyrodia scariosa*
- *Leucopogon ericoides*
- *Lomandra longifolia*
- *Melaleuca nodosa*
- *Melaleuca squamea*
- *Monotoca elliptica*
- *Monotoca scoparia*
- *Persoonia lanceolata*
- *Philothea salsolifolia*
- *Pimelea linifolia*
- *Pomax umbellata*
- *Pteridium esculentum*
- *Restio fastigiata*
- *Ricinocarpos pinifolius*
- *Styphelia viridis*
- *Woolfsia pungens*
- *Xanthorrhoea resinifera*
- *Xanthosia pilosa*



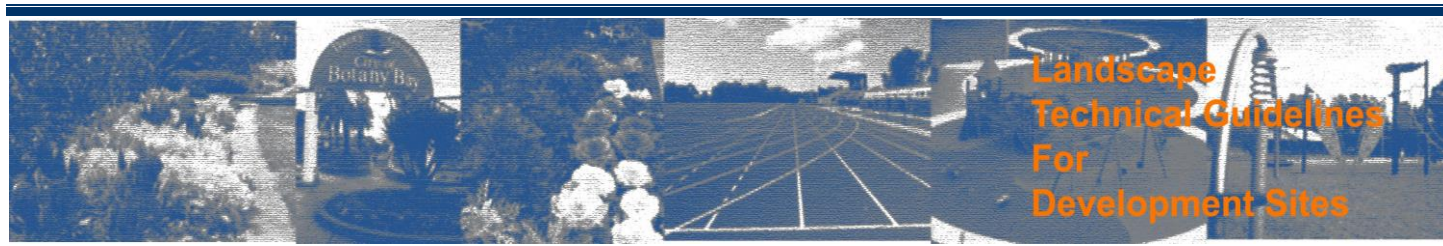
Appendix 3 - Noxious Weeds

Noxious weeds are those plants that because of their nature are harmful, unwholesome or unpleasant. Under the NSW *Noxious Weeds Act 1993*, plants proclaimed noxious must be controlled. To be declared a notifiable weed it is deemed to have a detrimental effect on the environment.

The responsibility for controlling noxious weeds on private property lies with the property owner. Failure to enact noxious weed control could result in legal action or a fine.

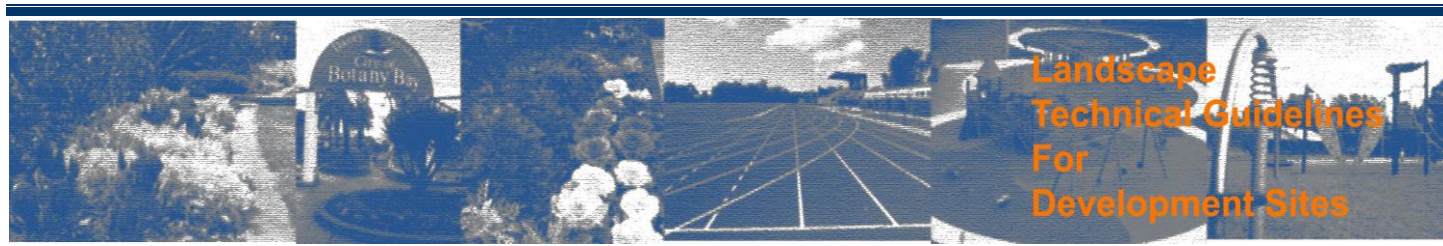
The following is a list of weeds declared noxious in the Bayside LGA. Further information regarding weed removal methods or classification can be obtained from www.dpi.nsw.gov.au and www.sydneyweeds.org.au

Name	Class
African feathergrass [<i>Pennisetum macrourum</i>]	5
African turnipweed [<i>Sisymbrium runcinatum</i>]	5
Alligator weed [<i>Alternanthera philoxeroides</i>]	3
Anchored water hyacinth [<i>Eichhornia azurea</i>]	1
Annual ragweed [<i>Ambrosia artemisiifolia</i>]	5
Arrowhead [<i>Sagittaria montevidensis</i>]	4
Artichoke thistle [<i>Cynara cardunculus</i>]	5
Athel pine [<i>Tamarix aphylla</i>]	5
Bear-skin fescue [<i>Festuca gautieri</i>]	5
Bitou bush [<i>Chrysanthemoides monilifera subspecies rotundata</i>]	3
Black knapweed [<i>Centaurea nigra</i>]	1
Blackberry [<i>Rubus fruticosus</i> aggregate species] except cultivars Black satin Chehalem Chester Thornless Dirksen Thornless Loch Ness Murrindindi Silvan Smooth stem Thornfree	4
Boneseed [<i>Chrysanthemoides monilifera subspecies monilifera</i>]	2
Bridal creeper [<i>Asparagus asparagoides</i>]	4
Broomrapes [<i>Orobanche species</i>] Includes all Orobanche species except the native O. cernua variety australiana and O. minor	1
Burr ragweed [<i>Ambrosia confertiflora</i>]	5
Cabomba [<i>Cabomba species</i>]	5



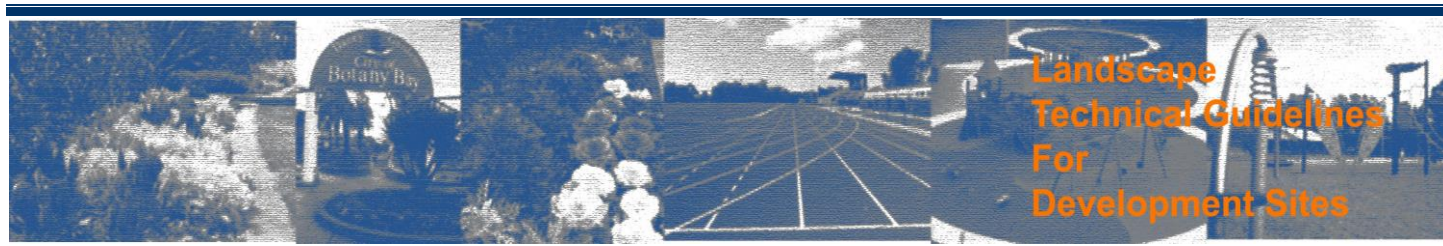
**Landscape
Technical Guidelines
For
Development Sites**

Includes all Cabomba species except <i>C. furcata</i>	
Castor oil plant [<i>Ricinus communis</i>]	4
Cayenne snakeweed [<i>Stachytarpheta cayennensis</i>]	5
Chilean needle grass [<i>Nassella neesiana</i>]	4
Chinese violet [<i>Asystasia gangetica subspecies micrantha</i>]	1
Clockweed [<i>Gaura parviflora</i>]	5
Corn sowthistle [<i>Sonchus arvensis</i>]	5
Dodder [<i>Cuscuta species</i>] Includes All <i>Cuscuta</i> species except the native species <i>C. australis</i> , <i>C. tasmanica</i> and <i>C. victoriana</i>	5
East Indian hygrophila [<i>Hygrophila polysperma</i>]	4
Espartillo [<i>Amelichloa brachychaeta</i> , <i>Amelichloa caudata</i>]	5
Eurasian water milfoil [<i>Myriophyllum spicatum</i>]	1
Fine-bristled burr grass [<i>Cenchrus brownii</i>]	5
Fountain grass [<i>Pennisetum setaceum</i>]	5
Gallon's curse [<i>Cenchrus biflorus</i>]	5
Glaucous starthistle [<i>Carthamus glaucus</i>]	5
Golden thistle [<i>Scolymus hispanicus</i>]	5
Gorse [<i>Ulex europaeus</i>]	3
Green cestrum [<i>Cestrum parqui</i>]	3
Harrisia cactus [<i>Harrisia species</i>]	4
Hawkweed [<i>Hieracium species</i>]	1
Heteranthera [<i>Heteranthera reniformis</i>]	1
Horsetail [<i>Equisetum species</i>]	1
Hydrocotyl [<i>Hydrocotyl ranunculoides</i>]	1
Hygro [<i>Hygrophila polysperma</i>]	
Hygrophila [<i>Hygrophila costata</i>]	2
Hymenachne [<i>Hymenachne amplexicaulis</i> and hybrids]	1
Karoo thorn [<i>Acacia karroo</i>]	1



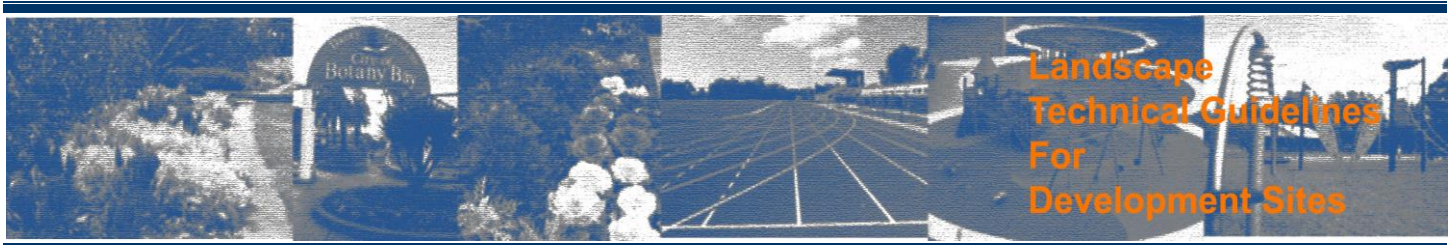
**Landscape
Technical Guidelines
For
Development Sites**

<u>Kochia [Bassia scoparia]</u> except Bassia scoparia subspecies trichophylla	1
<u>Kosters curse [Clidemia hirta]</u>	1
<u>Lagarosiphon [Lagarosiphon major]</u>	1
<u>Lantana [Lantana species]</u>	4
<u>Leafy elodea [Egeria densa]</u>	4
<u>Lippia [Phyla canescens]</u>	4
<u>Long-leaf willow primrose [Ludwigia longifolia]</u>	3
<u>Ludwigia [Ludwigia peruviana]</u>	3
<u>Mexican feather grass [Nassella tenuissima]</u>	1
<u>Mexican poppy [Argemone mexicana]</u>	5
<u>Miconia [Miconia species]</u>	1
<u>Mikania [Mikania micrantha]</u>	1
<u>Mimosa [Mimosa pigra]</u>	1
<u>Mossman River grass [Cenchrus echinatus]</u>	5
<u>Pampas grass [Cortaderia species]</u>	3
<u>Parthenium weed [Parthenium hysterophorus]</u>	1
<u>Pellitory [Parietaria judaica]</u>	4
<u>Pond apple [Annona glabra]</u>	1
<u>Prickly acacia [Acacia nilotica]</u>	1
<u>Prickly pear [Cylindropuntia species]</u>	4
<u>Prickly pear [Opuntia species]</u> Includes all Opuntia species except O. ficus-indica	4
<u>Privet (Broad-leaf) [Ligustrum lucidum]</u>	4
<u>Privet (Narrow-leaf/Chinese) [Ligustrum sinense]</u>	4
<u>Red rice [Oryza rufipogon]</u>	5
<u>Rhus tree [Toxicodendron succedaneum]</u>	4
<u>Rubbervine [Cryptostegia grandiflora]</u>	1



Sagittaria [<i>Sagittaria platyphylla</i>]	5
Salvinia [<i>Salvinia molesta</i>]	2
Senegal tea plant [<i>Gymnocoronis spilanthoides</i>]	1
Serrated tussock [<i>Nassella trichotoma</i>]	4
Siam weed [<i>Chromolaena odorata</i>]	1
Smooth-stemmed turnip [<i>Brassica barrelieri</i> subspecies <i>oxyrrhina</i>]	5
Soldier thistle [<i>Picnomon acarna</i>]	5
Spotted knapweed [<i>Centaurea stoebe</i> subspecies <i>micranthos</i>]	1
St. John's wort [<i>Hypericum perforatum</i>]	4
Texas blueweed [<i>Helianthus ciliaris</i>]	5
Tropical soda apple [<i>Solanum viarum</i>]	2
Water caltrop [<i>Trapa species</i>]	1
Water hyacinth [<i>Eichhornia crassipes</i>]	2
Water lettuce [<i>Pistia stratiotes</i>]	1
Water soldier [<i>Stratiotes aloides</i>]	1
Willows [<i>Salix species</i>] Includes all <i>Salix</i> species except <i>S. babylonica</i> , <i>S. x reichardtii</i> , <i>S. x calodendron</i>	5
Witchweed [<i>Striga species</i>] <i>Striga</i> species except the native <i>Striga parviflora</i>	1
Yellow burrhead [<i>Limnocharis flava</i>]	1
Yellow nutgrass [<i>Cyperus esculentus</i>]	5

There are also 32 “Weeds of National Significance” (WoNS). Refer to www.environment.gov.au.



Appendix 4 - Environmental Weeds

An environmental weed is any plant capable of spreading rapidly. They become an ecological or management problem as they are persistent and expensive to control. They may invade bushland or gardens, smothering and displacing other vegetation. Many environmental weeds have been imported for ornamental or agricultural purposes but thrive in the absence of natural predators and their ability to grow in a wide variety of situations. They also often have prolific seeding habits and simple germination requirements. There are also 28 weeds listed on the “National Environmental Alert List”. Refer to www.environment.gov.au.

The following are problematic environmental weeds in the Botany area.

Trees

Acacia saligna	Golden Wreath Wattle
Ailanthus altissima	Tree of Heaven
Cinnamomum camphora	Camphor Laurel
Cotoneaster spp.	Cotoneaster
Erythrina sykesii	Coral Tree
Ficus elastica	Rubber Tree
Gleditsia tricanthos	Honey Locust
Olea africana	African Olive
Olea europea	European Olive
Senna pendula	Cassia

Shrubs

Arundinaria spp. running Bamboos unless contained	Bamboo and other
Coprosma repens	Mirror Bush
Ochna serrulata	Mickey Mouse Bush
Phyllostachys spp.	Bamboo
Pyracantha sp.	Firethorn

Herbaceous Plants

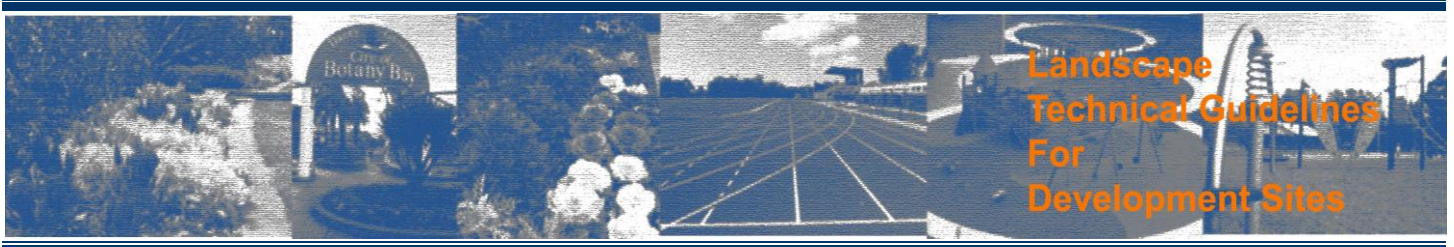
Arcotheca	Cape Weed
Ageratina	Crofton Weed
Bidens pilosa	Cobblers Peg
Conyza albida	Fleabane
Coreopsis lanceolata	Coreopsis
Foeniculum vulgare	Fennel
Hypochaeris radicata	Catsear/Flatweed
Oenothera sp	Evening Primrose
Plantago lanceolata	Common Plantain
Protasparagus aethopicus	Asparagus Fern
Tradescantia flaminensis	WanderingJew

Grasses

Cynodon dactylon	Couch
Eragrostis curvula	African Love Grass
Pennisetum calndestinum	Kikuyu
Paspalum digitatum	Paspalum

Vines

Acetosa saggitata	Turkey Rhubarb
Anredera cordifolia	Madiera Vine
Araujia sericifolia	Moth Vine
Cardiospermum grandiflorum	Balloon Vine
Hedera helix	English Ivy
Ipomaea indicia/cairica	Morning Glory
Thunbergia elata	Black Eyed Susan



Appendix 5 - Heritage and Significant Trees

Applicants must refer to Council for appropriate protection measures and bonds for any tree on their property which may be listed as a heritage tree requiring protection under **Bayside Local Environmental Plan 2021**.

A number of trees have been listed under **Bayside Local Environmental Plan 2021** as heritage trees. These trees are not to be removed under any circumstances and, in accordance with the *Environmental Planning and Assessment Act 1979*, stipulations apply relating to their protection and management.

A tree may be considered “significant” in Botany Bay if it has significant or meaningful visual impact or environmental amenity, is rare or unusual, has historical or heritage significance (is representative or a remnant or relic of a past era or style of planting), performs an important or necessary function e.g., screening, provides habitat, age or is generally a good specimen tree worthy of preservation. Council will apply specific protection measures and/or tree preservation bonds to such trees if on a development site. Council is currently compiling a list of significant trees.