# SC6.7 Landscaping

## SC6.7.1 Introduction

### SC6.7.1.1 Application

1. This planning scheme policy applies to development where an applicable code identifies Planning Scheme Policy SC6.7 Landscaping as supporting an outcome of the code.

### SC6.7.1.2 Relationship to the Planning Scheme

1. This planning scheme policy is to be read in conjunction with the assessment benchmarks specified in the Planning Scheme and applies to the whole of the local government area.

### SC6.7.1.3 Purpose

1. The purpose of this planning scheme policy is to ensure that development complies with the local government's standards for the planning, design, location and construction of infrastructure that reflects acceptable standards in engineering, asset management, environmental management and natural resource planning by:
   a. specifying information requirements;
   b. specifying standards and guidelines;
   c. specifying administrative arrangements;
   d. specifying the circumstances in which Council may accept a security for the completion of work.
2. The policy is designed to assist the designer in achieving the following:
   a. accessibility;
   b. Crime Prevention Through Environmental Design (CPTED);
   c. shading and shade trees;
   d. visual enhancement of the streetscapes;
   e. improved living environments by reducing the impacts of noise, fumes, urban heat island effects and car headlights;
   f. the use of a wide range of fit-for-purpose plant species with an emphasis on natives and particularly endemic species to develop increased habitat and plant diversity to provide a food source for indigenous fauna and reduce the potential impact of disease from monocultures.

### SC6.7.1.4 Technical Standards

1. Planning, design, construction and maintenance of works identified in this policy are to comply with the nominated relevant standards. Where standards and/or specifications are not stipulated for certain infrastructure elements, guidance may be obtained through engagement with Council.
2. A reference in the policy to a specific resource, guideline, standard or document means the latest version of the resource, guideline, standard or document.

### SC6.7.1.5 Consultation

1. Council may seek third party advice or comment about an application where:
   a. development may conflict with a code; or
   b. technical advice is required to assess the development.
2. Where technical advice is outsourced to an independent consultant an additional fee will apply.

# SC6.7.2 Development application requirements

## SC6.7.2.1 Application preparation

1. Any conflicts or departure from the standard drawings and the policy are to be detailed in the development application.
2. Where a staged development has been approved by Council, Council may require engineering design and construction to include the whole of the site, or such additional parts of the site as this will enable Council to maintain the works in a satisfactory condition if the balance of the development does not proceed to completion.
3. All design drawings and calculations are to be supervised and certified by competent persons as referred in section SC6.7.2.2 Competent persons.

## SC6.7.2.2 Competent persons

1. A person preparing a report, a plan or a drawing relating to development must be a suitably qualified person and include:
   a. for removal of trees that relate to landscape character - a qualified arborist, with a minimum Australian Qualifications Framework Level 5 in arboriculture;
   b. for landscaping plans (generally) that do not require the restoration of vegetation or habitat — a Registered Landscape Architect (RLA);
   c. for restoration plan in urban and rural areas - the qualifications required under Planning Scheme Policy SC6.1 Biodiversity;
   d. for park design - a Registered Landscape Architect (RLA).
2. The report, plan or drawing must include certification signed by the relevant, suitably qualified person that the report, plan or drawing is fit for its intended purpose and can be relied upon by Council for that purpose.

## SC6.7.2.3 Planning (design) approval

### SC6.7.2.3.1 Landscape plan site assessments

1. The purpose of a site assessment is to describe the values and features of the site that are relevant to the matters to be addressed in a Landscaping plan.
2. Each site assessment should comprise of:
   a. project location and address;
   b. project title and description;
   c. the date on which the assessment and any plans were prepared, including any amendments;
   d. name and relevant professional qualifications of the person/s preparing the assessment;
      i. for smaller developments such as a dual occupancy, landscape designs are to be prepared by a qualified landscape designer.
      ii. for a larger development such as subdivision, landscape designs are to be prepared by a qualified landscape architect.
   e. for all plans include a north point, scale, location of property boundaries road alignments and street names;
   f. all plans must be to of a scale for clear legibility of all information required for assessment. The following scales are recommended:
      i. 1:1,000 Landscape Site Analysis or Statement of Landscape Intent;
      ii. 1:100 or 1:200 General or Detailed Landscape Plans;
      iii. 1:500 Streetscape Plans;
      iv. 1:50 or 1:20 Construction Details;
   g. a linear dimensions are to be indicated in metres or millimetres;
   h. a levels are to be in relation to the AHD (Australian Height Datum);
   i. a slopes are indicated as a ratio (i.e. 1H:6V) or as a percentage (i.e. 25%).
3. Plans are to be submitted as portable document file (PDF) that can be printed at either A3 size or retains an appropriate scale when printed at A3 size.
4. The Landscaping site assessment should also address the following matters:
   a. existing conditions being soil types, moisture conditions, services description and direction of prevailing winds and any other climatic conditions that may impact on the landscape works and other encumbrances such as easements;
   b. where landscaping was previous approved on a site to be redeveloped an assessment of the quality of the vegetation and any failures that have occurred;
   c. existing site plan demonstrating the location of:
      i. remnant vegetation, wildlife corridors, rare and threatened species, tree groupings, significant trees, habitat trees including the botanical name and size of each plant, and the intention to retain or remove the plants;
      ii. landscape features such as any views, ridgelines, rocky outcrops, scarred or carved trees, stone circles, earthen

arrangements or bora grounds, rock art and places of cultural significance;
iii. waterways, wetlands and dams on the land and within 30m on adjoining land;
iv. existing buildings, site signage, landscape structures, storage areas, pedestrian or cycleways, accesses, driveways, parking areas, lighting, outdoor furniture and fencing, including height, width and materials;
v. any sensitive land uses on adjoining and adjacent land;
vi. contours related to the Australian Height Datum and spot levels, including levels at the base of all significant trees and hard landscaping surface levels to be retained;
vii. existing services, stormwater drainage systems and easements;
viii. any existing slopes, slope analysis, specifically greater than 15% slope, retaining walls, earth cuts or mounds to be retained or remediated, including existing height, width and materials;
ix. land below the defined flood event (DFE).

## SC6.7.2.4 Landscape plans

1. The purpose of a Landscape plan is to describe how the values and features identified in a site assessment are to be managed to meet the outcomes of the relevant planning scheme codes.
2. Landscape plans should deliver:
   a. amenity outcomes;
   b. functional and resilient landscaping for the life of the development;
   c. efficient and sustainable ongoing maintenance regimes.
3. The Landscape plan, in addition to the site assessment requirements, should:
   a. state the purpose, aims and objectives of the Landscape plan;
   b. if a Landscape site assessment has been prepared, state its key findings;
   c. provide justification for any proposed variation from the measures outlined in the related planning scheme code;
   d. include details of any consultation that has occurred. Examples include any discussion with Council, state or federal agencies, technical consultants, and any stakeholders, including affected landowners and the public;
   e. identify the parties to be responsible for any specific actions identified in the Landscape plan.
4. Identify any Planning related elements such as landscape screening, buffers or rehabilitation areas.
5. The Landscape plans and documentation should identify how the matters identified in the Landscape site assessment are to be addressed by the development.
6. The Landscape plans should be accompanied by an assessment against the applicable planning scheme codes including any justification for any non-compliance with the codes.

## SC6.7.2.5 Landscape management plans

1. Landscape management plans should incorporate the following information:
   a. location and name of existing trees and plant species;
   b. soil type and moisture conditions;
   c. location of drainage, sewerage and other underground services and overhead power lines;
   d. details of landscape structure including areas of deep planting;
   e. contours or spot levels if appropriate;
   f. proposed surfaces;
   g. where landscaping is to be carried out above a basement, podium roof or other upper level, the means of drainage;
   h. fence size and material;
   i. schedule of plants;
   j. plan of watering system indicating method by which landscaping will be maintained.
2. A landscape management plan should also provide remedial measures on screening certain areas such as:
   a. refuse areas;
   b. untidy, waste disposal areas and the like;
   c. interfaces to sensitive land uses;
   d. areas or places with a clear line of sight into neighbouring living areas.
3. Restoration areas: A rehabilitation program should be prepared to restore degraded land. Provide a list of species to be re-established in disturbed areas. Restoration should be representative of original regional ecosystem structure and composition. Topsoil should be stockpiled to assist the restoration program and measures to prevent erosion losses from the stockpile should be implemented to reduce sedimentation of watercourses. Topsoil must be stockpiled to a maximum of 1.5m to reduce microbial breakdown.

### SC6.7.2.5.1 Landscape plans

1. For smaller (residential scale) developments, a basic landscape plan may be a simple freehand sketch with notes identifying the intent of the landscape areas associated with the development.
2. For larger (multiple residential) or public and civic spaces a detailed landscape plan is required.
3. A concept landscape plan should:

a. explain how the design responds to the site assessment or analysis;
b. identify the intent for the external spaces and landscape areas of the proposed development;
c. focus broadly on issues of character, function and amenity;
d. identify framework species for open space areas and road reserves.

4. A typical landscape plan should include:
   a. proposed location and function of public and private open space areas;
   b. location of any buildings, structures, roads, accesses, site furniture and an indication of their form and character;
   c. location of planting areas, buffers, screens, rehabilitation areas, any large garden bed areas;
   d. delineation of hardscape areas such as roads, car park, pedestrian paths, accesses and exits (including site entry or gateway statements);
   e. delineation of visual links, sightlines or view corridors;
   f. identification of drainage and stormwater management site issues;
   g. identification of any desired character themes if character themes are employed in the overall concept;
   h. identification of proposed plant species to be used in all planting areas (e.g. native, exotic, feature planting, form and colour);
   i. a description of how other elements of the Landscaping plan such as the detailed planting plan, planting schedule (species selection), maintenance schedule and (if applicable) open space management plan is integrated into the overall concept.

### SC6.7.2.5.2 Detailed landscape plans

1. For a larger development such as subdivision, a detailed landscape plan is required, comprising a written statement supported by a graphical layout supported by explanatory notes.
2. A detailed landscape plan provides the detailed design drawings for all landscape works associated with a development. These plans also provide the information for pricing the works for construction. A detailed planting plan should include the following information:
   a. location of all existing and proposed buildings, site signage, landscape structures, storage areas, pedestrian or cycleways, accesses, driveways and parking areas, lighting, outdoor furniture (where relevant) and fencing; including height, width, and materials;
   b. locations of proposed plants and existing plants, significant or habitat trees to be retained;
   c. location and total area of any vegetation to be cleared;
   d. location and total area of remediation or rehabilitation areas;
   e. landscape features and places of cultural significance to be retained or removed;
   f. numbers and density of plants;
   g. dimensions of planting beds;
   h. materials of edging, mulch; surface treatments (e.g. grass, paving), fencing, pergolas and raised gardens;
   i. maintenance and watering systems (e.g. drip irrigation);
   j. location and landscape treatment of waterways, wetlands, detention basins, overland flow paths, field inlets, any land below the defined flood event (DFE) or the 1% ARI;
   k. places of cultural significance to be retained on site;
   l. any changes to slopes greater than 15%, such as earth cuts or mounds to be retained or remediated, including existing height, width, and materials;
   m. spot levels, of finished hard landscaping surface levels including levels at the top and base of retaining walls and related to Australian Height Datum at a 0.25m interval;
   n. landscape treatment of slopes greater than 10% including retaining walls height, width, and materials;
   o. schedule and details of any embellishments (furniture, fixtures, signage, lighting, etc)
   p. any changes to stormwater drainage systems;
   q. any change to any existing services including mains, trunk infrastructure and on-site effluent disposal systems;
   r. location, width, and purpose of all easements (i.e. existing or proposed);
   s. location of street and median landscaping;
   t. location and type of permanent methods for erosion control.

# SC6.7.3 All landscaping works

1. The following list identifies the IPWEAQ Standard drawings for landscaping:
   a. Active transport suite:
      i. PCD-301 Bikeways - Standard Entrance Control;
      ii. PCD-302 Bikeways - Featured Entrance Control;
      iii. PCD-303 Bikeways - Slowdown Control - Reverse Curve;
      iv. PCD-304 Bikeways - Entrance Control - Offset Chicane
      v. PCD-401 Bikeways - Rest Rail Detail;
   b. Fences, barriers & public furniture suite:
      i. FBD-102 Fencing - Chain Wire Security Fencing;
      ii. FBD-103 Fencing - Log Barrier & Alternative Hardwood Timber Bollard;
      iii. FBD-104 Fencing - Locking Rail Types 1, 2, & 3;
      iv. FBD-105 Fencing - Tubular Steel Fence With & Without Chain Wire;
      v. FBD-106 Fencing - Welded Mesh Fencing And Control Fence;
      vi. FBD-108 Fencing - Entrance Barrier - Single Swing Gate;
      vii. FBD-109 Fencing - Entrance Barrier - Double Swing Gate;
      viii. FBD-201 Stairs - Reinforced Concrete;
   c. Home owner suite:
      i. PCD-101 Pathways - Concrete Pathway - Construction Details;
   d. Parks suite:
      i. PSD-101 Street Trees - Street Tree Planting Details - Including Root Barriers;
      ii. PSD-102 Street Trees - Street Tree Planting Details - Wide Median;
      iii. PSD-103 Street Trees - Street Tree Planting Details - Narrow Median;
      iv. PSD-201 Park Drainage - Sub-soil Drainage Details;
      v. PSD-202 Park Drainage - Drainage Swale Details - Sheet 1 of 2;
      vi. PSD-203 Park Drainage - Drainage Swale Details - Sheet 2 of 2;
      vii. PSD-301 Paths & Edging - Typical Edge Details;
      viii. PSD-302 Paths & Edging - Decomposed Granite & Asphalt Path Details;
      ix. PSD-501 Recreational Facilities - Basketball Halfcourt - Plans & Post Sections - Sheet 1 of 2;
      x. PSD-502 Recreational Facilities - Basketball Halfcourt - General Notes - Sheet 2 of 2;
      xi. PSD-601 Recreational Facilities - Cricket Practice Net - Plans & Sections - Sheet 1 of 3;
      xii. PSD-602 Recreational Facilities - Cricket Pitch Plans & Sections - Sheet 2 of 3;
      xiii. SD-603 Recreational Facilities - Cricket Practice Net - Notes & Specification - Sheet 3 of 3
   e. Roads suite:
      i. RSD-200 Kerb & Channel - Profiles And Dimensions - Including Edge Restraints, Median & Channel.

## SC6.7.3.1 Design principles

1. There are six key principles for landscaping works: Safety, Resilience, Environment, Character, Community and Economics. The principles should be used to guide development of all landscaping plans and detailed below.

### SC6.7.3.1.1 Safety

1. Roads are dangerous environments. Any landscaping within road reserves must prioritise the maintenance of traffic and pedestrian safety. It is important however to ensure that safety controls are appropriate to the risks posed – busier and higher speed environments obviously require increased safety measures, but it would be inappropriate and unfortunate to limit landscaping interventions if not warranted.
2. The following key objectives guide safety outcomes:
   a. improve safety in transportation of goods and people while minimising the impact on the environment, the community and wildlife;
   b. improve safety through early planning and design processes that take consideration of maintenance and repair processes;
   c. provide comfortable and safe areas for the community by implementing CPTED principles;
   d. promote practical and effective connections for both vehicles and pedestrians (prioritisation of movements).
3. The following design principles promote safety:
   a. select species that are frangible, particularly for high speed environments;
   b. select plants species that have minimal limb-drop, particularly where adjacent to paths;
   c. ensure tree spacing and plant placement do not hinder the operational requirements of lighting and road safety;
   d. encourage low vegetation to maximise sight lines, particularly at intersections;
   e. maximise natural surveillance by using low or permeable planting in areas of high public use;
   f. use a combination of landscape and materials to raise awareness of changing environments, and to delineate

pedestrian movements from vehicle movements;
g. design road reserves to avoid areas for concealment and entrapment;
h. divide or delineate vehicular traffic and crossings adjacent to pedestrian areas;
i. observe tree height limits where adjacent overhead powerlines.

### SC6.7.3.1.2 Resilience

1. There is an ever-growing need to create environments (including road reserves) that are more able to withstand change, adapt to changing conditions, and be repaired or rehabilitated following change. The particular risks must be identified and, to the extent appropriate, measures incorporated to withstand or avoid those risks and maximise community resilience.
2. Key objectives include:
   a. promote drought and flood mitigation measures during early stages of design;
   b. select materials that have high tolerances to different environmental conditions (sun, shade, water, heat or fire);
   c. encourage the use of low flammable materials, including vegetation in bushfire prone areas.
3. The following design principles promote resilience:
   a. select materials that can withstand instances of flooding for flood risk areas;
   b. select plant species that are drought tolerant and can withstand inundation;
   c. improve street tree locations to maximise opportunities for passive watering;
   d. provide shade trees to enhance pedestrian connections and provide protection from the sun;
   e. utilise appropriate species to attenuate stormwater flow;
   f. utilise materials that are easily repaired or replaced when damaged;
   g. select plant species with low flammability in bushfire prone areas, particularly for windbreaks;
   h. create separation between groups of plantings to reduce spread of fires (minimise continuous vegetation in bushfire prone areas).

### SC6.7.3.1.3 Environment

1. A region's environmental resources are critical in terms of ecological processes as well as the contribution they make to sense of place and amenity. The appropriate treatments are critical for maintaining the integrity and connectivity of the broader environment.
2. Key objectives for looking after the environment are:
   a. increase and maintain the diversity of vegetation used in the road reserves;
   b. provide linkages integral for fauna movement and ecological sustainability;
   c. promote the use of recycled materials;
   d. protect the region's soils and prevent erosion and salinity.
3. The following design principals are important to improving the environment:
   a. to significant improvement of the habitat and biodiversity of an area;
   b. enhance and protect ecological networks adjacent to natural sensitive areas and/or provide vital connections for wildlife;
   c. promote the use of local and native plants in areas of high ecological value;
   d. ensure fauna movements are addressed according to the relevant local and state policies;
   e. include systems to aid treatment of road runoff before joining the stormwater systems;
   f. include subsoil drainage in areas of poor draining conditions;
   g. minimise the use of impervious materials to improve infiltration of water runoff;
   h. include the use of energy efficient lighting.

### SC6.7.3.1.4 Character

1. As some of the most visible and prevalent landscape types in the region, landscaping presents a unique opportunity for defining and reflecting the particular sense of identity and characteristics of an area.
2. The following design principles are important to maintaining places character:
   a. mark gateways or entry points through providing feature planting;
   b. maintain views to high amenity or scenic areas;
   c. provide screening according to land use zones along road frontages;
   d. consider the enhancement and integration with existing heritage places;
   e. distinguish pedestrian movements from vehicular ones by selecting and using different materials to minimise confusion — pavement selections colours, footpath crossing over driveways;
   f. include a family of elements to maintain consistency - use of species, colours, and materials that reflect culture and heritage of the area;
   g. ensure placement of furniture or signage is suitable to the space available;
   h. utilise vegetation (species, spacing, type) to provide passive wayfinding.

### SC6.7.3.1.5 Community

1. Towns are made and formed by their communities. It is important to provide places that promote interaction and sense of ownership.
2. The following design principles are important to creating a sense of community:
   a. provide strong links and accessible streetscapes for the community;
   b. provide opportunities for seating and gathering to allow the community to meet and interact, and contribute to a sense of place;
   c. promote the use of plant species suitable for the region which contribute to the education of the community;
   d. provide adequate lighting to all paths and areas of pedestrian traffic, controlling light spillage;
   e. locate parking areas where they provide significant value to the community and people passing through (e.g. travellers with caravans);
   f. incorporate seating or signage as part of walls or other elements — reduce clutter on the road reserve;
   g. seek to retain and enhance trees or other elements that have particular meaning for the community.

#### SC6.7.3.1.6 Economic viability

1. Landscaping treatments proposed must balance the desired outcomes with the initial investment and ongoing maintenance costs.
2. Promoting treatments which have manageable capital costs and can be effectively maintained is paramount.

## SC6.7.3.2 Design

1. The Appendices provide a list of species that are suitable for:
   a. preferred species, generally;
   b. salinity tolerant species;
   c. street landscaping;
   d. screen landscaping.
2. The regional ecosystem classification for the site may assist in selecting plant species suitable to the location (refer to Regional ecosystem species listed on Council's website).
3. Key outcomes the policy seek to promote:
   a. ecological restoration;
   b. maintenance efficiency;
   c. implementation of planting and design specific to location or place;
   d. reinforcing street hierarchy through planting design;
   e. enhancing existing character;
   f. consistent use of materials and finishes;
   g. visually appealing and connected spaces;
   h. environmentally responsive planting according to the use of the area.
4. At construction, the developer is to provide all approved landscape including:
   a. on-street landscaping, this includes street trees grass establishment to road verges, and landscaping of traffic islands and buffer landscaping;
   b. public open spaces;
   c. furniture and treatments for pedestrian and cyclist facilities (including seat benches, bins, pedestrian lighting, fences, bike racks and rails);
   d. in road reserve landscaping works, including:
      i. street landscaping including verge and tree planting and/or turf zones, street trees, traffic islands and roundabouts;
      ii. screen landscaping buffers;
   e. private (on lot) landscape including:
      i. roof tops and podium level planning;
      ii. on grade turf and planting zones;
      iii. communal and recreation zones;
   f. public Open Spaces including signage, furniture and playgrounds;
   g. natural area restoration.
5. All landscaping work that will be become a public asset will be subject to a strict assessment, on maintenance, off maintenance and bonding processes to ensure that the proposed works comply with the Planning Scheme.
6. Copper Chrome Arsenate (CCA) treated timber is not to be used for the construction of Council assets

## SC6.7.3.3 Landscape plans for certain settings

1. Landscaping plans that are for screening or restoration areas should consider the location. Where development is occurring for example in a Conservation zone; Rural zone, or Special industry zone species used for buffers should be consistent with the regional ecosystem category as to thrive with minimal maintenance while achieving the requirements.
2. In urban areas consideration should be given to ongoing maintenance and the character of the locality. Planting plans

should demonstrate that 80% of the species are from the preferred species list for the location or be consistent with the regional ecosystem category. Character and street trees that are not native but relevant to the locality can form the remaining 20% of plantings.
3. Selections of species and densities must also consider other factors such as Natural hazards, risk and resilience assessments and management.
4. Detailed planting plans should consider specific landscape treatments, to address the outcomes of the relevant code. Landscaping treatments may include the following arrangements of planting for:
   a. detention basins, waterways, wetlands, and dams should use preferred species listed for wetlands and riparian areas, respectively (refer to Appendices 1 to 5);
   b. undesirable species listed should be considered at all locations to determine if a plant species is suitable for the location and activity (refer to Appendix 6).

### SC6.7.3.4 Site stability

1. To ensure that landscapes provide for the stability of soils and minimise potential for erosion, landscapes are to be sited and designed to respond appropriately to site specific conditions in accordance with an approved landscape plan which addresses the following:
   a. the removal of vegetation on steep, sensitive or unstable land does not undermine the stability of the land or impact unnecessarily on downstream conditions. Where vegetation is removed outside construction or project boundary, it shall be reinstated;
   b. stabilising of plant species and supporting establishment materials to be utilised on erosion prone areas, such as batters, slopes and waterway and drainage line edges. Planting is to be at a sufficient density to support stability of the site and where soil is imported onto the site, soils used shall be well constructed and contain adequate organic material.
2. Erosion prone and degraded areas in an open space or proposed park (e.g. bare areas with a steep gradient, unstable slopes, compacted ground and habitat areas invaded by environmental weeds) is effectively stabilised and improved through rehabilitation works.
3. Rapid site capture is to only be used on sites where the only objective of the project is to rapidly stabilise or provide cover to a site. A high percentage of pioneer and early successional species are used in these projects, to obtain the quickest growth rates. Direct seeding is not a viable option in wet season where high intensity rainfall washes seed away.
4. Rapid site capture is to provide a quick environmental solution in an area in the shortest possible time with the least amount of input by using quick growing local species. By providing a canopy cover in the shortest possible time period is to reduce the site maintenance input and risk to the environmental values.

### SC6.7.3.5 Site drainage

1. Grassed areas and paved areas are graded to ensure that drainage is directed to landscaped areas, stormwater inlets or to infiltration areas (e.g. natural wetlands or recharge areas) and not be channelled towards erodible batters, retaining structures, visitor and recreation facilities, or neighbouring properties.
2. Soil ground-water profile is recharged by directing subsoil drainage or swale drains to planting areas, with provision for overflow to the stormwater system.
3. Hollows are eliminated to prevent ponding, or field gullies are provided in low spots with connections to the stormwater system or infiltration areas.
4. Potential trip hazards by siting raised inlets in activity areas is avoided. The design of roads and car parks incorporates the principles of water sensitive urban design.
5. If required, bioretention swales are installed to polish and disperse drainage

### SC6.7.3.6 Existing vegetation

1. To retain established landscape character, all trees located within existing road reserves are to be protected and retained unless approved otherwise by Council.
2. Existing vegetation is to be included as part of the landscape plan submission indicating information about the proposed treatment, classification and description of existing vegetation to be retained or removed.
3. Information about existing vegetation is to be provided in a tabular format and include:
   a. position;
   b. height;
   c. diameter at breast height (DBH) — Tree Protection Zone (TPZ);
   d. diameter at root flare, Structure Root Zone (SRZ);
   e. identify dead and defective trees not worth keeping;
   f. Botanic Name and Common Name (if known);
   g. crown spread;
   h. measurements taken in accordance with AS 4970 Protection of trees on development sites.
4. Existing trees with a trunk diameter of 150mm or greater are to be identified.

5. Existing trees located within a proposed new road reserve verge are to be protected. This may require the adoption of non-standard utility service alignments, as such designers are encouraged to discuss proposed solutions with Council.
6. The construction of roads, pathways, fire breaks and building setbacks on private lots adjoining the open space or park is preferred, particularly where:
7. there is a slope greater than 15% within the site;
8. continuous natural vegetation must be retained across the boundary between the site and the private property;
9. vehicle access to the proposed firebreak is restricted and future maintenance would only be possible using handheld equipment;
10. the firebreak has no strategic value for fire suppression or prescribed burning operations.
11. The removal of native vegetation to construct a firebreak or fire management line on Council owned land or Council managed open space or park to protect neighbouring properties may be approved by Council where no reasonable alternative is available.
12. Development that results in the removal of existing shade and street trees replaces these trees with vegetation identified in the Appendices 1 to 5 suitable to the location with 100L minimum stock size planted in sufficient quantity to achieve a total canopy area of at least 100% of the removed vegetation when mature.

#### SC6.7.3.6.1 Weed eradication

1. Restricted weeds are to be managed on site before planting in line with General Biosecurity Obligation. Any pest that would interfere with a planting is to be managed on site before a planting occurs.
2. The Lockyer Valley Biosecurity Plan has been developed as a requirement under the *Biosecurity Act 2014*. This plan identifies the roles and responsibilities of all stakeholders, including Council, state government and landowners. This plan also sets out guidelines for monitoring and evaluating pest management activities across the region.
3. The Lockyer Valley Region Biosecurity Plan specifies species that may not be approved for landscaping installation on Council land.

#### SC6.7.3.6.2 Weed control

1. Technical advice must be obtained before the commencement of the weed control program. Removal of all prohibited and restricted matter weeds is required from the site during site preparation and weed control works must continue during the landscaping maintenance period. Prohibited and restricted matter weeds are designated under the *Biosecurity Act 2014*.
2. Other environmental weeds must be removed from the site, subject to the following requirements:
   a. Environmental weeds in the understorey must be removed progressively throughout the site establishment and maintenance period and replaced with desirable species. In some cases environmental weeds can be important in stabilising erosion prone areas or providing habitat for fauna, so a staged approach is necessary;
   b. Large trees on the park site that are technically defined as environmental weeds must be assessed to determine whether they have other values, such as landscape amenity or heritage values. Valuable trees are to be retained and appropriately integrated in the site development.

### SC6.7.3.7 Soils and growing media

1. Soils and growing media are to comply with:
   a. AS 4419 Soils for landscaping and garden use;
   b. AS 3743 Potting mixes;
   c. AS 4454 Composts, soil conditioners and mulches;
   d. AS 1289 Methods of testing soils for engineering purposes;
   e. AS 1152 Specification for test sieves.

#### SC6.7.3.7.1 General requirements

1. It is preferred that soil on site is utilised and if required be blended or conditioned to attain the required specifications and should be tested by an agronomist or laboratory to recommend fertiliser, treatment, gypsum or requirements to get it to the appropriate standard. Soils need to comply with the following specifications:
   a. friable and fee draining;
   b. good texture and structure for selected use;
   c. acceptable conductivity and PH levels intended plant species group selected;
   d. soil should be applied at the following depths, topsoil (turf and grass areas) 100mm, garden soils and planted areas 200mm;
   e. soil composition must comply with Australian Standard AS 4419 Soils for landscaping and garden use. The soil must consist of the following composition:
      i. sand 25-85%;
      ii. silt 0-50%;
      iii. clay 5 — 25%;

iv. organic Matter >2%;
v. salinity (EC) <500 microsiemens/cm;
vi. pH 5.5 to 7.0.

2. Storage of soil for top dressing must consider fire ant control measures outlined by Biosecurity Queensland, be maintained to control weeds and stockpiled where wind dispersion will not cause concerns to neighbouring properties.

### SC6.7.3.7.2 Soil quality

1. The quality of the growing medium for plants is of the highest importance for the success and longevity of the vegetation.
2. Local topsoil stripped from the site is favoured as it contains organic matter, beneficial microorganisms and mycorrhizal fungi which support plant life and is to be free from litter, weed propagules, contaminates and rocks larger than 25mm in diameter.
3. Imported topsoil, where the required quantity of local topsoil is unavailable, is to be incorporated and blended with site topsoil to achieve a healthy and active growing medium. Imported topsoil is to be similar to naturally occurring local topsoil and suitable for the establishment and ongoing viability of the selected vegetation, free of weed propagules and contaminants.
4. Imported soils (and garden mulches) are to be obtained from suppliers with Nursery Industry Accreditation Scheme Australia (NIASA), from the Nursery and Garden Industry Queensland (NGIQ), or accreditation from Landscape Queensland.
5. All necessary measures are to be taken to prevent fire ants (or any stages of the fire ant's life cycle) entering the work site. For further information, refer to the Queensland Government Department of Agriculture and Fisheries (DAF).
6. Podium and planter box soils (e.g., roof top gardens) are to consist of a lightweight mix based (to manage any structural limitations) on high quality horticultural products and organic matter (not greater than 30% by mass) that it has; good water holding capacity, a high cation exchange capacity and creates a structural framework that is not subject to decomposition or slumpage.
7. Local and imported topsoil are to be tested and proven to comply with AS 4419 Soils for landscaping and garden use, by a Certified Practicing Soil Scientist (CPSS) and/or a soil scientist who is eligible for membership with the Australian Soil Scientist Society (ASSS) with sampling to be carried out in accordance with AS 4419 Soils for landscaping and garden use, at a NATA registered laboratory.
8. A CPSS and/or a soil scientist who is eligible for membership with the ASSS before requesting on maintenance inspection is to provide:
   a. on maintenance report providing detailed analysis of the sampled material along with recommendations of required ameliorants (refer Table SC6.7-1: On Grade Soil depths and volumes);
   b. certification that all works have been carried out in accordance with recommendations, with the soils being suitable for their specified use and for the establishment and ongoing viability of the vegetation; and
   c. certification and photographic evidence of the required soil depths for all planting areas.
9. Table SC6.7-1: On grade soil depths and volumes provides minimum requirements in relation to soil depths and volumes.
10. Table SC6.7-2: Artificial growing media depths and volumes provides minimum requirements in relation to soil depths and volumes.
11. Specification for the landscaping soil mix are as follows:
    a. approximately 70% sandy loam and 30% composted or mature organic matter;
    b. friable and not contain any clay;
    c. pH between 5.5 and 7.0;
    d. free from contaminants such as the seed of declared weeds, rocks, sticks and salts;
    e. not contain any chemical fertilisers.

**Table SC6.7-1: On grade soil depths and volumes**

| LOCATION OR ELEMENT | SUBGRADE CULTIVATION DEPTH | AMELIORATED SITE TOPSOIL OR IMPORTED TOPSOIL COMBINED WITH AMELIORATED SITE TOPSOIL DEPTH |
|---|---|---|
| Trees | N/A | Tree planting pits are to be excavated to the depth of the rootball and cultivated to a width of 2-3 times the rootball diameter |
| Palms | N/A | Palm planting pits are to be excavated to twice the width of the rootball and the bottom of the pit is to be cultivated to a depth of 150mm |
| Mass planted areas | 150mm | 400mm |
| Turf areas | 100mm | Minimum topsoil depth is to be 100mm |
| Tube stock | 150mm | Minimum friable topsoil depth is to be 200mm |

### SC6.7.3.7.3 Soil salinity

1. Preparation of salinity-affected sites may include:

a. adding gypsum to balance the high sodium levels in the soil;
b. deep ripping of sodic soil crusts to allow water, air and root penetration;
c. adding topsoil to replace soil that has been eroded due to saline conditions;
d. raising beds and installing drainage lines to provide areas that are not permanently waterlogged;
e. planting while the water table is low or planting trees around boggy areas first may be options on some sites so that planting does not occur in wet soil;
f. mulching to decrease evaporation and thus decrease the concentration of salt at the soil surface;
g. mulching to decrease the need for irrigation while the plants are establishing;
h. mulching to encourage micro-organisms and soil fauna such as worms that break down organic matter to release nutrients into the soil. Increased organic matter also improves the soil's water-holding capacity so that plants have a longer period in which to utilise soil moisture before it drains past the root zone into the groundwater system; and
i. adding mulch, fertilisers and soil conditioners to improve the likelihood of vigorous plant growth. Vigorous plants are more likely to overcome salty or boggy conditions and to maximise use of available rainfall and thus decrease leakage to groundwater systems.

2. When adding soil to reshape areas, create garden beds, or sound barriers it is important to ensure that water flow, both lateral and vertical, is not inhibited. A mound that is too steep may shed water faster in lateral flow before the water can infiltrate the root zone.
3. Vertical water movement might be inhibited if soil with a different permeability is used for mounding or is placed over compacted soil. The new soil should be keyed into the existing surface rather than placed over compacted soil. This will help ensure that roots, nutrients, micro-organisms and water can move from the new soil into the former land surface.
4. All imported soils should be tested to ensure that high levels of salt are not imported into the site.
5. A lack of water and a restricted root zone may result in stunting and plant death.
6. Site preparation should also consider the purpose of the area, as follows:
   a. what activities are to be conducted in the area?
   b. will there be much pedestrian traffic?
   c. are there in-ground cables, drainage or sewer lines that could be affected by vigorous root systems?
   d. are there overhead powerlines?
   e. is the area for entertainment and leisure or does it have a specific function such as a roundabout?
7. The design of the area and the plants chosen should reflect:
   a. the site's use;
   b. climate, aspect and soil properties;
   c. the site's potential role in salinity processes and management.

### SC6.7.3.7.4 Growing media

1. Priority is to be given to using existing site soil as imported soil is a limited resource. Existing topsoil is conserved by either not disturbing the soil during construction or by stockpiling it before construction starting. Subsoil is to be cultivated to a minimum depth of 150mm for garden beds and turfed areas unless this will adversely affect the roots of established trees.
2. The minimum topsoil depth is:
   a. 100mm for non-irrigated turf areas;
   b. 200mm for irrigated turf areas;
   c. 400mm for garden beds;
   d. 1,000mm over an area 1,500mm x 1,500mm for trees in deep-planting areas;
   e. 400mm or 1.5 times the root-ball depth, whichever is greater, over an area of twice the root-ball diameter for trees supplied in pots or bags.
3. If more soil is required to meet these minimum depths, soil is to meet AS 4419-2003 Soils for landscaping and garden use.
4. The soil quality is sufficient to allow plants to grow effectively. Soil amelioration measures to improve the infiltration of existing soils, the soil's macropore and micropore balance and ensure a stable soil ecosystem, include the following:
   a. scarifying crusted topsoil layers;
   b. aerating topsoil layers;
   c. deep ripping subsoil layers;
   d. using hand tools only within the tree protection zone of a tree for retention;
   e. applying gypsum to sodic clay topsoils and subsoils;
   f. installing a 50mm layer of lucerne hay between the topsoil and mulch layer;
   g. adding worms to the topsoil;
   h. applying soil rhizobia in solution to the topsoil;
   i. inoculating plants with mycorrhizal fungi;
   j. incorporating soil wetters, crystals and wettable foams.
5. For artificial growing environments, growing media is to be selected to achieve best performance and sustainability of vegetation. Indicative soil depths and volumes for green elements are in Table SC6.7-2: Artificial growing media depths and volumes.

**Table SC6.7-2: Artificial growing media depths and volumes**

| VEGETATION TYPE | GROWING MEDIA OR SUBSTRATE | | |
|---|---|---|---|
| | SOIL BASED GROWING MEDIA | | INORGANIC LIGHTWEIGHT MATERIAL AND DECOMPOSED ORGANIC MATTER MATRIX |
| | INTENSIVE GREEN ROOFS, CONTAINERS FOR TRELLIS SYSTEMS, RAKING GARDENS AND TERRACE PLANTERS | | GREEN WALLS, EXTENSIVE GREEN ROOF, RAKING GARDENS |
| | MINIMUM MEDIA DEPTH (MM) | MINIMUM MEDIA VOLUME (L) | |
| Vines or scrambling species | 400 | 100L for every $1m^2$ foliage at 100mm of thickness | Systems designed to achieve and maintain suitable organic matter, nutrient and water balance to sustain vegetation |
| Turf | 300 | Not applicable | |
| Sprawling groundcovers | 300 | 50L | |
| Grasses and small shrubs to 600mm [1] | 450 | Minimum media depth x canopy projection | |
| Medium shrubs to 1m [1] | 600 | | |
| Large shrubs to 3m [1] | 600 | | |
| Small trees to 5m [1] | 800 | Minimum surface area of 1.5m x 1.5m or Height (m) x Calliper (mm)/$100m^3$, whichever is greater | Not applicable |

*Note — [1] Heights are measured at maturity of vegetation.*

## SC6.7.3.8 Mulch

1. Mulch helps to reduce the growth of weeds, keeps soil temperatures more constant and helps to retain soil moisture levels. Mulching is beneficial if it covers the entire area rather than a ring around individual trees. Mulch is to be installed to a depth of 100mm and should be left just clear of the plant stem. Mulches are not suitable for use in areas subject to concentrated water flow unless covered by netting or suitably sized gravel mulch is used.
2. In overland flow paths or areas subject to regular inundation, organic mulch must be replaced with a mulch treatment, such as riparian planting over an approved erosion control matting or coarse gravel or stones over an approved erosion control fabric.
3. It is desirable that mulches be made and stored on site where suitable material is available.

### SC6.7.3.8.1 Types

1. Natural forest mulch to be used in ‘natural planting areas only, such as screen landscaping or park planting or restoration areas. It should be installed to a minimum 100mm compacted depth, free from rocks, nut grass, and any other invasive weed. Where abundant biomass is present from sprayed grasses and weeds, the sprayed vegetation may be considered a suitable mulch by Council, without the requirement for additional commercial mulch.
2. Organic mulch must be provided consistent with AS 4454 Composts, soil conditioners and mulches in the open space in the following situations:
   a. moisture retention and weed suppression is required in garden beds and around the base of trees.
   b. grass performance is poor, or mowing is impractical (e.g. around the base of mature figs).
   c. the space between trees or other structures (e.g. signs) is less than 3m and mowing are impractical.
   d. a non-grassed surface is required (e.g. around and under some visitor facilities).
   e. habitat rehabilitation is desired and/or grassing is not desired.
3. Loose particle mulches must comply with the following requirements:
   a. particle size range 5mm to 50mm
   b. minimum depth:
      i. garden beds, 75mm;
      ii. restoration areas, 50mm;
   c. final mulch grade 25mm below edge treatments;
   d. free of weeds, soil, sticks and rocks;

e. binding qualities to minimise dispersion by the elements or slope;
f. durable - minimum 12 months effective longevity;
g. remains pervious.

4. The following mulch composition or origins are not acceptable;
   a. sawdust;
   b. non-organic material;
   c. treated or painted timber; and
   d. noxious or undesirable weeds.
5. Organic mulch matting is required for loose particle mulches on steep or unstable slopes.
6. Organic mulch matting must comply with the following requirements:
   a. Natramat TM, 3mm coir fibre mat with latex bonding, or approved equivalent;
   b. Biodegradable;
   c. durable - effective longevity minimum requirement, 12 months (Maintenance period);
   d. stake to secure effectively;
   e. overlap edges, layer with the direction of flow to prevent lifting;
   f. cut holes to locate containerised plant stock; and
   g. repair accidental cuts by staked patches.
7. The following mulch matting products are not acceptable:
   a. non-organic material;
   b. nylon meshes or wire net binding.

***Editor's note—Refer to LCD-3 for typical restoration area mulches, LCD-4 for typical garden bed mulches.***

#### SC6.7.3.8.2 Implementation

1. All garden beds are required to be mulched.
2. Mulch must be sufficiently composted and stored, to not bind and lead to water shedding.
3. Mulch is kept free from the stem or the trunk of a plant to a minimum distance of 100mm radius.
4. Mulch is free of foreign matter including rock, soil, weeds and sticks.
5. Mulch in a garden area and at the base of a tree has a minimum depth of 100mm.

### SC6.7.3.9 Turf

1. Turf supplied is to be:
   a. cultivated lawn turf (A and B grade) is to be supplied by an accredited Turf Accreditation Program (TAP) producer;
   b. turf is to be of good quality, free from oxalis (Oxalis spp.), nut grass (Cyperus rotundus), paspalum (Paspalum spp.) (unless specified for salt tolerance), and other environmental weed and/or invasive plant species; and
   c. turf is to be delivered within 24 hours of cutting.
2. Open space areas or park must be grassed or as otherwise specified in the approved landscape design and report drawings.

#### SC6.7.3.9.1 Preparation

1. Before turfing, all weeds are to be killed by spraying a suitable non-residual aquatic friendly suitable glyphosate-based herbicide. Sprayed areas are to remain undisturbed for two weeks.
2. Topsoil is to be uniformly applied to provide an average thickness of 50mm with a minimum compacted thickness of 25mm at any location and graded to even-running contours, so that no ponding or waterlogging occurs across the surface of the grassed area.
3. Stones and boulders that could become a hazard if thrown by mowing equipment must be removed, or alternatively the hazardous items are covered with at least 100mm of topsoil. Topsoil profiles prepared for turfing or grassing must be free of harmful material e.g. sticks, tree roots, and stones greater than 25mm in diameter. Ensure new areas are married into existing levels and set downs for hard surfaces are specified. Holes and depressions must be filled, and trip hazards rectified during the establishment and maintenance period.
4. Fertiliser should be applied before to laying turf at a minimum rate of 350kg for each hectare, subject to specific site conditions, soil analysis and desired outcomes.
5. Topsoil is to be raked before turf is laid. Turf is to be laid in straight lines with staggered cross joints on the general line of the contour of the slope. The gaps between adjacent sections of turf should not exceed 5mm.
6. The prepared surface is to be watered within 24 hours before to turfing at an application rate of 10mm of water in not less than 1 hour. Watering is to be carried out in such a way as not to cause any scouring or erosion.

#### SC6.7.3.9.2 Condition

1. The turf is to be supplied as rolls in long lengths of uniform width, not less than 300mm, and be in sound unbroken

condition.
2. The moisture level in the cut turf should be kept consistent so that it is not saturated or severely dried out when laying. Both situations can cause turf to fall apart during laying.

### SC6.7.3.9.3 Installation

1. Turf must be supplied and installed in compliance with the following minimum requirements:
   a. minimum quality 'A' grade, 85% dominance of winter green couch except where on dispersive or saline soils;
   b. minimum 25mm turf sod, delivered moist and laid within 24 hours of cutting on farm;
   c. ensure ground preparation is carried out., with removal of undesired weeds and grasses;
   d. once turf has been laid, it must be rolled and irrigated;
   e. if required low spots to be top dressed and levelled after first mowing.
2. Turfed areas must be larger than 10m x 10m. A minimum gap of 3m between trees and/or other structures (e.g. signs) is provided in turfed areas to allow for mowing. Use a grass species that best suits the local conditions and proposed level of use.
3. Stabilising strips of turf must be laid in overland flow paths or areas subject to regular inundation, alongside pathways, and around visitor facilities and sport and recreation facilities.
4. A light top dressing is to be worked into the open joints between the turf and then the turf lightly rolled with one pass of a roller weighing about 80kg on a 1m width of roller.
5. On steep slopes turf may be held in position by softwood pegs or stakes, located at each end of the turf sections.
6. At least 80% grass cover must be achieved before acceptance 'on maintenance'.
7. After watering, a lawn pesticide is to be applied at the rate specified by the supplier and in accordance with the Agricultural Chemicals Distribution Control Act and Agricultural Chemicals Distribution Control Regulations.
8. Watering is the application of 10mm of water to the total area in not less than 1 hour including any natural rainfall. The frequency of watering is to comply with the following requirements in Table SC6.7-3: Watering schedule for turf.

**Table SC6.7-3: Watering schedule for turf**

| PERIODS AFTER TURFING | WATERING |
|---|---|
| Immediately | Once |
| Week 1 | Once every second day |
| Weeks 2 to 4 | Three times each week |
| Week 5 until necessary | Twice a week. |

9. Acceptance is to be the achievement of an even green colour with a dense continuous sward over the whole area. Turf is to show signs of healthy growth and be free of weeds, stones, sticks and other deleterious material. Maximum deviation from finished ground levels 50mm in any 2m.

## SC6.7.3.10 Seeding

1. Seeding must use basic green couch mix and be carried out by:
   a. reliable broadcast method;
   b. scarifier or direct drill;
   c. purpose built hydroseed or mulch mixer and pump.
2. All seeding methods must ensure that the following requirements are met:
   a. selected seed is viable and not environmentally harmful;
   b. application rates are adequate to provide full cover.

### SC6.7.3.10.1 Preparation

1. Before grass seeding, all weeds are to be killed by spraying a non-residual aquatic friendly suitable glyphosate-based herbicide. Sprayed areas are to remain undisturbed for two weeks.
2. Before grass seeding, the ground surface is to be lightly turned to a depth of 100mm below finished surface levels. All large stones, rubbish and other materials that may hinder germination is to be removed before topsoiling.
3. Topsoil is to be uniformly applied to provide an average thickness of 75mm with a minimum compacted thickness of 40mm at any location and graded to even-running contours, so that no ponding or waterlogging occurs across the surface of the grassed area.

### SC6.7.3.10.2 Installation

1. Fertiliser should be applied following seeding at a minimum rate of 350kg for each hectare, subject to specific site conditions, soil analysis and desired outcomes.
2. Seed and fertiliser should be applied at an even rate using a calibrated disc drill seeder followed by a chain and roller.
3. Discs should cut approximately 12mm and create enough friable material for chains to cover the seed.
4. Where one pass fails to develop enough friable material a second pass should be made in a transverse direction.
5. Watering is the application of 10mm of water to the total area in not less than 1 hour including any natural rainfall. The frequency of watering is to comply with the requirements in Table SC6.7-4: Watering schedule for seeding.

**Table SC6.7-4: Watering schedule for seeding**

| PERIODS AFTER SEEDING | WATERING |
|---|---|
| Immediately | Once |
| Week 1 | Twice a day during hot dry windy periods; or<br>Once a day during cool or overcast periods |
| Weeks 2 | Once a day |
| Weeks 3 & 4 | Once every second day |
| Week 5 until necessary | Twice a week; or<br>As necessary to ensure 80% minimum strike rate. |

6. Acceptance is to be the achievement of a minimum vegetative cover of 80% of both the annual and perennial grass cover over the whole area. Grassed areas are to show signs of healthy growth and be free of weeds, stones, sticks and other deleterious material. Maximum deviation from finished ground levels 50mm in any 2m.
7. Minimum germination and cover requirements are:
   a. 75% germination after 2 months;
   b. 80% coverage is to be achieved and maintained for a minimum period of 6 months before acceptance off maintenance;
   c. method of coverage is even;
   d. ground preparation is consistent with seeding method;
   e. soil moisture levels are maintained before and after seeding to promote strong germination and establishment;
   f. weed competition is eliminated or sufficiently maintained.
8. All traffic to be kept off seeded areas during establishment. Failed seeded areas must be re-sowed promptly to ensure that adequate germination levels are likely to be reached.

## SC6.7.3.11 Hydroseeding and Hydromulching

1. Identify reference Australian Standards;
   a. AS 4454-2003 Composts, soil conditioners and mulches;
   b. National Seed Quality Standards for Basic and Certified Seed

### SC6.7.3.11.1 Preparation

1. Before hydromulching all weeds are to be killed by spraying a non-residual aquatic friendly suitable glyphosate-based herbicide. Sprayed areas are to remain undisturbed for two weeks.
2. Grass species chosen need to suit the local conditions and proposed level of use. Stabilising strips of turf shall be laid in overland flow paths or areas subject to regular inundation, alongside pathways, and around visitor facilities and sport and recreation facilities.
3. Topsoil profiles prepared for grassing shall be free of harmful material e.g., sticks, tree roots and stones greater than 20mm in diameter. Holes and depressions shall be filled, and trip hazards rectified during the establishment and maintenance period.
4. Stones that could become a hazard if thrown by mowing equipment shall be removed, or alternatively the hazardous items are covered with at least 100mm of topsoil.
5. Batter slopes less than 20% are to be lightly cultivated to a depth of 100mm to produce a loose surface and all large stones, rubbish and other materials that may hinder germination are to be removed before topsoiling.
6. Where batters have been stepped, the steps are to be loosely filled with topsoil. Elsewhere, topsoil is to be uniformly applied to provide an average thickness of 75mm with a minimum compacted thickness of 40mm at any location.
7. Dry surfaces are to be watered by a fine spray before the application of the hydromulch.

### SC6.7.3.11.2 Installation

1. The slurry mixture of mulch, binder, fertiliser and seed is to be kept in a homogenously mixed state throughout the

mulching operation.
2. During preparation of the hydromulch, a liquid form pesticide may be added to the storage tank, to facilitate surface application. Application rates should be in accordance with the manufacturer's instructions.
3. Other protective treatments (e.g. fibre matting, anionic bitumen emulsion etc) are to be as specified on the approved drawings.
4. Hydromulch is to not be applied under the following weather conditions:
   a. when temperature is higher than 35ºC;
   b. when winds exceed 15 km/hr;
   c. where the surface is too wet; or
   d. during rain periods or when rain appears imminent.
5. Watering is the application of 10mm of water to the total area in not less than 1 hour and include any natural rainfall. The frequency of watering is to comply with the requirements in Table SC6.7-5: Watering schedule for hydromulch

**Table SC6.7-5: Watering schedule for hydromulch**

| PERIODS AFTER GRASSING | WATERING |
|---|---|
| Immediately | Once |
| Week 1 | Twice a day during hot dry windy periods<br>Once a day during cool or overcast periods |
| Weeks 2 | Once a day |
| Weeks 3 & 4 | Once every second day |
| Week 5 until necessary | Twice a week or as necessary to ensure 80% minimum strike rate. |

6. A follow up fertiliser treatment is to be applied to 4 — 6 weeks after germination has occurred. Fertilisation should be a product that provides the following elements:
   a. Nitrogen (N) 13%;
   b. Phosphorus (P) 4%;
   c. Potassium (K) 12%.
7. Acceptance is to be subject to the achievement of a minimum vegetative cover of 80% of both the annual and perennial grass cover over the whole area. Hydromulched areas are to show signs of healthy growth and be free of weeds, stones, sticks and other harmful material.
8. The rate at which the mulch is applied is dependent on slope and is to be consistent with the below Table.

**Table SC6.7-6: Hydromulching material and application rates (for each 1,000m$^2$)**

| SLOPE | < 5% | 5% - 10% | 10% - 15% | 15-20% | > 20% |
|---|---|---|---|---|---|
| Pulped Paper | 200kg | 120kg | 120kg | 140kg | 200kg |
| Baggase<br>(Wet weight) | 200kg | 400kg | 500kg | 700kg | 800kg |
| Cane Fibre<br>(Alternative to baggase) | 200kg | 200kg | 300kg | 400kg | 500kg |
| Fertiliser | 50kg | 50kg | 50kg | 50kg | 50kg |
| Seed | 5kg | 5kg | 5kg | 5kg | 5kg |
| Water | 8000L | 8000L | 10,000L | 12,000L | 18,000L |
| Binder:<br>Curasol<br>Envirotack | <br>5L<br>3kg | <br>5L<br>2kg | <br>7.5L<br>3kg | <br>15L<br>4kg | <br>30L<br>5kg |
| Mulch Thickness | 1-2mm | 2-3mm | 2-4mm | 2-4mm | 4-6mm |

## SC6.7.3.12 Irrigation

1. Irrigation systems must be designed to an agreed life, either short term to assist with landscape establishment, or long term for ongoing park maintenance. Systems providing ongoing maintenance will only be accepted in high profile metropolitan parks and sport parks or landmark or signature point parks. The system must follow a Council approved design, manufactured and installed to highest Council and industry standards. Irrigation systems that make use of recycled water or stormwater are preferred. At least one tap must be installed next to or within each landscaped area and

garden bed that will require periodic watering. All trenches need to be backfilled with sand.
2. Where there is reticulated water supply, automatic irrigation systems are to be provided to all garden beds constructed within road reserves, parks and open space as part of the development works. Where specifically required within the development conditions issued by Council, irrigation systems will also be required to be provided to grassed areas within parks and sporting fields. The irrigation systems are to comply with the requirements defined below and AS 3500 Plumbing and drainage (set). Drainage for gardens contained within the road pavement is to link to the established drainage systems and be of sufficient design to cater to the leached water. An impermeable membrane to 900mm depth is to surround the perimeter of gardens to prevent leaching of water into the road subgrade.
3. Reticulated water is to be provided to irrigation systems from a water meter and backflow device consistent with Urban Utilities standards. Payment of costs associated with irrigation water used to establish and maintain the planting during the maintenance period is to be made to Urban Utilities before Council will accept the development Off Maintenance.

### SC6.7.3.12.1 Irrigation controllers

1. Irrigation controllers must be installed in a metal cabinet that is lockable, easily accessible for maintenance and inspections.
2. Irrigation controllers must be connected to a 240V power supply. Approval and associated fees with connection are to be paid by applicant before Council will accept system off maintenance. Minimum standard for irrigation controllers is as follows:
   a. controller is required to have an operating voltage of 12 to 24 volts with the ability for full automation and manual settings;
   b. has the ability to host dual programming with the ability of a 7-day cycle;
   c. provide a pump or master valve circuit that can operate a combination of valves;
   d. wiring of controller must be contained in conduits with excess wiring provided in valve boxes for future expansions.
3. All documentation relating to the irrigation system must be provided to Lockyer Valley Regional Council before being accepted on maintenance. Documents include:
   a. “As Constructed” drawings showing the location of all irrigation components and sizes of connecting pipework;
   b. a schedule of all equipment installed including brand names and model numbers;
   c. operation manuals for system controllers;
   d. warranty documentation applicable to the system;
   e. proposed watering program for the irrigation system.

### SC6.7.3.12.2 Irrigation rates

1. Irrigation rates of the irrigation system should be set to consider different plant types that have been planted as a part of the landscape plans, e.g. native species require less water than exotics. To conserve water, any irrigation system must be operated efficiently.
2. When setting the irrigation system, the following apply:
   a. apply water at a rate so that it does not pond or create run off;
   b. do not apply water when the soil is already adequately moist to sustain plant growth, whether because of rain or other watering;
   c. apply water in such a manner so that it does not fall on buildings or hard surfaces and run to waste;
   d. do not apply water in windy conditions where the distribution pattern for the irrigation or sprinkler systems will be affected;
   e. apply water only to gardens that are sufficiently mulched to reduce evaporation;
   f. apply water to only lawns that have been laid on soil underlay with a minimum depth of at least 100.

### SC6.7.3.12.3 Irrigation system

1. Where permanent irrigation is required to effectively maintain the development landscape, because of species chosen or harshness of the microclimate, an irrigation system is to be installed, tested, and commissioned by an irrigation consultant.
2. Irrigation works are to be designed and installed utilising best management practices whilst taking into consideration future maintenance costs to the asset owner and the safety of the asset users.
3. All below ground pipework is to be unplasticised Poly-vinyl Chloride (uPVC) unless otherwise approved. All pipes are to be Class 12 minimum with Class 18 fittings.
4. All above ground pipe work is to be copper tube (hard drawn) Type D manufactured in accordance with AS 1432 Copper tubes for plumbing, gas fitting and drainage applications.
5. If a separate irrigation system within the verge is desired, the developer will be required to pay all installation costs, which include:
   a. connection to water supply;
   b. installation of 25mm diameter (typical) backflow prevention device;
   c. installation of pipework and pop-up sprinklers;

   d. installation of solenoid valves and automatic controller.
6. Where required, temporary irrigation is to provide establishment watering up to a point where the landscape can survive wholly dependent on rainfall.
7. The property owner or applicant is to decommission all temporary irrigation before acceptance of works Off maintenance. All temporary irrigation is to comply with water conservation requirements (water restrictions, demand management and water security strategies etc) and designed in such a way to ensure public safety and limit risk of vandalism (i.e., under surface installation where possible in public areas).

### SC6.7.3.12.4 Irrigation pipework

1. All below ground pipework is to be unplasticised Poly-vinyl Chloride (uPVC) unless otherwise approved. All pipes are to be Class 12 minimum with Class 18 fittings.
2. All above ground pipe work is to be copper tube (hard drawn) Type D manufactured in accordance with AS 1432 Copper tubes for plumbing, gas fitting and drainage applications.

### SC6.7.3.12.5 Site stormwater harvest capacity

1. The harvesting of stormwater allows the capture and reuse of stormwater for non-potable uses. Stormwater can be captured from carparks, roads, parks, gardens, and footpaths. Capturing and reusing stormwater reduces the volume of contaminated stormwater entering local waterways, providing a benefit to the local environment.
2. The planning, design and implementation of stormwater drainage integrates the two distinct components of stormwater management (i.e., water quantity and water quality). The stormwater drainage system must:
   a. prevent or minimise adverse social, environmental and flooding impacts on the city's waterways, overflow paths and constructed drainage network;
   b. ensure that the design of channel works uses natural channel design principles where possible;
   c. design developed by qualified engineer.
3. Stormwater quality management is to be addressed through a development proposal when looking at capturing site stormwater.
4. When considering capturing site stormwater harvesting, stormwater quality improvement devices must be included in the development proposal.

### SC6.7.3.12.6 Stormwater harvesting and storage systems

1. The harvesting of stormwater allows the capture and reuse of stormwater for non-potable uses. This not only provides a valuable water resource, but it also helps with the management of stormwater quality. Capturing and reusing stormwater reduces the volume of contaminated stormwater entering local waterways, reduces the frequency and the magnitude of frequent runoff events.
2. The Water by Design Stormwater Harvesting Guidelines are to be referenced for additional technical guidance. The adoption of any stormwater harvesting off take system must not adversely affect adjacent flood levels.

## SC6.7.3.13 Planting

1. Planting complies with:
   a. AS 4419 Soils for landscaping and garden use;
   b. AS 3743 Potting Mixes;
   c. AS 4454 Composts, soil conditioners and mulches;
   d. AS 4373 Pruning of amenity trees;
   e. AS 2303 Tree stock for landscape use.
2. A thorough landscape specification is essential in delivering sustainable landscape works.

### SC6.7.3.13.1 Planting preparation

1. In preparation and planting, the following is to be undertaken:
   a. all rubbish, rubble, environmental weeds and invasive plants, grass and debris shall be removed from planting areas before planting;
   b. all landscape gardens to turf interface areas associated with the turf verge are to be delineated with a durable hard edge able to withstand brush cutters;
   c. establish a minimum 100mm of composted forest mulch (which is a combination of leaf, timber and bark) to all garden areas immediately after planting, soil laden tub grindings will not be accepted;
   d. all necessary measures are to be taken to prevent fire ants (or any stages of the fire ants life cycle) entering the work site. For further information, refer to the Queensland Government Department of Agriculture and Fisheries (DAF);
   e. landscaping shall not obstruct overland flow paths and is to include adequate drainage to minimise ponding. Mulch or

any floatable material is not located in swales or overland flow paths;
f. landscaping shall not encroach onto kerb and channel, footpaths, pedestrian or vehicular circulation areas during any stage of growth. Plants are to be positioned with consideration to full height and width potential of the plant at maturity, with no requirement for constant pruning to prevent such encroachments;
g. landscaping shall not restrict access to services. Refer to appropriate utility service provider for any specific requirements and further guidance;
h. do not plant during adverse weather conditions. Suspend excavation when the soil is wet and during frost periods;
i. appropriate plant spacings are to be provided to avoid establishment problems and plant failure due to over embellishment. Plant size at maturity is to be considered to ensure minimal or partial overlap of other plantings. Other matters to be considered should include the species' spread and habit, to minimise undesirable issues. An over embellishment of plants in a small area forces plants to compete for nutrients, whereby they can struggle to establish;
j. nursery stakes, ties and labels are to be removed after planting. Where appropriate and safe, nursery stakes may be required to remain for a longer period to provide ongoing support. These supports are to be removed by the end of the maintenance period;
k. plantings are to be setback from paths of travel so at to not interfere with pedestrians;
l. plantings are to be watered before transportation to the site;
m. where transporting large trees, the tree/s are to be covered to prevent sun and wind scorch or burn;
n. during loading and unloading damage in handling is to be avoided.

### SC6.7.3.13.2 Planting

1. All plants are to be planted at the as detailed on the approved drawings and unless otherwise specified.
2. Plants are to be arranged to ensure an even and attractive coverage of vegetation across all planting areas and provide:
   a. visual interest;
   b. way finding;
   c. shade;
   d. screening;
   e. weed suppression.
3. Planting areas ensure that public safety is not compromised.
4. Planting is to be carried out as soon after delivery to the site as possible. All containers, unless fully biodegradable, are to be removed at the latest point before planting.
5. Root systems and mature height and width of the vegetation are to be considered to reduce the imposition on adjoining pathways, roads, infrastructure or services and structures. Similarly, the choice and planning of shrubs and trees is to be undertaken with care to ensure that sightlines and safety for users of the landscape spaces are not compromised.
6. Backfilling around plants, the soil is to be lightly firmed to ensure intimate contact with the roots, but with large material successive layers of soil will need to be lightly firmed as backfilling proceeds.
7. Ensure the plants are held securely by the soil but not so that moisture penetration of the soil is restricted. After planting, damaged, dead, diseased or crossing branches are to be removed by pruning.
8. Plants should be watered directly after planting before to spreading of mulch. The mulch is to be left clear of the plant stem.
9. To ensure establishment, all trees are to be appropriately staked with hardwood or recycled plastic stake, extending into the ground to a depth of 500mm. Do not allow the stake to penetrate the root ball. Trees are to be loosely supported from each stake by hessian tree tie (refer IPWEA Standard drawing, PSD-101 Street Trees - Street Tree Planting Details - Including Root Barriers).
10. Mulch is to be aged forest and hardwood woodchip, stockpiled for a minimum of 6 weeks, free from rocks, non-biodegradable and toxic material. In paved footpath planters it is to be installed to a depth of 75mm, in tree guards, traffic islands and mulched, mass planted garden beds within parkland and reserves to a depth of 150mm depth.
11. Natural forest mulch to be used in 'natura' planting areas only, such as screen landscaping or park planting or restoration areas. It should be installed to a minimum 150mm compacted depth, free from rocks, nut grass, and any other invasive weed.
12. Tea-tree mulch is prone to combustion and must not be used unless permission is obtained from Council.
13. All plants are to be watered, immediately upon planting, and as required by soil moisture conditions for the first thirteen weeks. The use of slow-release drip irrigation watering is recommended.
14. Weed and grass growth in mulched areas are to be killed by treatment with herbicide in accordance with the manufacturer's instructions at monthly intervals during the construction period and contract maintenance period. Contact of the herbicide with the new plants are to be avoided and any damage repaired, or damaged plant material replaced.
15. Watering is the application of 10mm of water to the total area in not less than 1 hour and include any natural rainfall. The frequency of watering is to comply with the requirements in Table SC6.7-7: Watering schedules for plants (generally).

**Table SC6.7-7: Watering schedules for plants (generally)**

| PERIODS AFTER GRASSING | WATERING |
|---|---|
| Immediately | Once |

| | |
|---|---|
| Week 1 | Twice a day during hot dry windy periods<br>Once a day during cool or overcast periods |
| Weeks 2 | Once a day |
| Weeks 3 & 4 | Once every second day |
| Week 5 until necessary | Twice a week or as necessary to ensure 80% minimum strike rate. |

### SC6.7.3.13.3 Acceptance on maintenance

1. Acceptance is to be subject to achieving the following criteria. Plants which do not meet the acceptance criteria are to be replaced. Replacement plants are to be of similar size and quality and of identical species and variety to the plant being replaced.
   a. Plants are to exhibit signs of healthy growth;
   b. Plants are to be well formed;
   c. Plants are to be free from disease or insect pests;
   d. Plants are to be free of physiological disease symptoms (yellowing, wilting etc);
   e. Mulch is to be free from weeds, sticks, rubbish and other deleterious material.

### SC6.7.3.13.4 Plant selection

1. All plants are to be obtained from a nursery located in an area having a similar climate to the site of the works.
2. Planting design within urbanised areas positively contributes to the amenity of the development and to the diverse subtropical character and ecology. Planting palettes are required to:
   a. suit the conditions and landscape character of the area and minimise use of potable water for irrigation;
   b. avoid plants which have high maintenance and irrigation requirements, are short lived or require regular replacement;
   c. provide shade and shelter to increase user comfort in public and semi-public spaces and provide suitable solar access;
   d. favour local and “cultivar” native plants with moderate use of suitable non-invasive exotic species. The hierarchy of plant species (in preferred order) is as follows;
      i. Lockyer Valley natives;
      ii. Australian natives;
      iii. non-invasive exotic species;
      iv. plants not included in the planting index that meet criteria set out in this section.
   e. be devoid of plants with large thorns or spines, which are poisonous or present a severe allergy risk to the public;
   f. avoid invasive plants;
   g. use exotic palms as an emergent rather than dominant landscape feature and use species are right for the location, consistent with their natural character and occurrence;
   h. provide visual interest through form, texture and variations in seasonal colour;
   i. provide compatibility with buildings, hard paved areas, overhead and underground services and scale relative to the size and nature of the development and its setting.

### SC6.7.3.13.5 Salinity plant selection

1. Some areas will require salt-tolerant plants while others will require plants that can also tolerate very wet conditions.
2. There are techniques to ensure that lawns are not exacerbating salinity problems. For example:
   a. adjust lawn mowers to their maximum (rather than minimum) height to allow grass to grow longer. Therefore, roots will penetrate deeper into the soil to access water and lawns will require less regular irrigation. An added benefit is that the soil is more protected from the sun so that evaporation, and thus concentration of salts at the soil surface, is limited;
   b. use a more water-efficient turf. Turf suppliers recommend a few Buffalo varieties as being very water-efficient and drought-tolerant. Couch is often observed growing around the edges of salt scalds and is therefore likely to be salt tolerant;
   c. install an efficient irrigation system. A timed irrigation system connected to water sensors will ensure that water is applied in an accurate manner and overwatering is prevented. Water sensors will detect soil moisture and turn off the irrigation system once soil moisture reaches the required level. Irrigation systems will remain off during periods of rainfall. Irrigation frequency and duration may also be reduced during winter. The level of moisture required will depend on plant needs, soil type and climate, so the irrigation program must be calibrated for the specific site conditions.

### SC6.7.3.13.6 Plant stock size and quality

1. All plant species are to be as detailed on the approved drawings. Council approval is to be obtained to substitute species.
2. All tree stock used within the landscape works is to conform with the stock selection criteria outlined in AS 2303 Tree

stock for landscape use, with an understorey of shrubs and ground covers within edged and mulched garden beds. Stock shall be healthy, vigorous and not pot bound.

3. The supervising landscape consultant is to submit a Tree Inspection Form (example available from AS 2303 Tree stock for landscape use) to Council before request for on maintenance.
4. Containerised plant stock must be installed in compliance with the following requirements:
   a. minor root canopy where required;
   b. evacuate sufficient size planting holes, backfill with suitable soil, whilst allowing for normal long term root development;
   c. position plant to ensure upon settlement top of the root ball is level with final grade;
   d. stake plants as specified or where required — allow for removal of stake before completion of maintenance period;
   e. fertilise and maintain plants to promote vigorous growth.
5. Trees for street planting and carparking must confirm with the following specifications:
   a. minimum container size — 45 litre container;
   b. minimum single truck clearance — 1m (street and carparking), 1.7m (roundabouts);
   c. minimum trunk calliper — 20mm;
   d. minimum overall height — 1.2m;
   e. minimum canopy — 0.6m (balance and well formed).
6. Shrubs are to have a minimum container size of 4.5 litre or 200mm container.
7. Groundcovers are to have a minimum container size of 1.3 litre or 140mm container.
8. In existing centres and neighbourhoods, all trees are to be advanced stock material, with:
   a. street trees a minimum stock size of 200L and a minimum height of 3.5m;
   b. feature trees a minimum stock size of 200L and a minimum height of 5m when planted.
9. All trees to have a minimum clear trunk of 1.8m measured from the top of the tree grate, porous paving or finished soil level where planted in garden beds or turf, to the lowest branch.
10. Transplanting ex ground stock must be carried out as follows:
    a. plant material is authorised for removal under statutory requirements;
    b. staged root and canopy pruning is carried out to minimise setback;
    c. specimen may require repeat treatments of rooting hormones to stabilise plants and stimulate regrowth;
    d. root ball is wrapped and protected to prevent disturbance throughout procedure;
    e. standard maintenance program is upgraded to accommodate for careful monitoring throughout establishment.
11. Plants used are to be local, native species, however Council recognises the cultural association of some exotic species in urban areas and may approve their use.

### SC6.7.3.13.7 Water sensitive urban design

1. Where water sensitive urban design principles are incorporated into the landscaping design, development is in accordance with the Water Sensitive Urban Design (WSUD) Technical Design Guidelines for South East Queensland Healthy Waterways (Water by Design Guidelines).

### SC6.7.3.13.8 Planting schedule and preferred species

1. All Landscaping plans should identify the species of plants to be used, by means of a Planting schedule.
2. A plant schedule should include the following information:
   a. a graphic code or key (nominated on the landscape plan);
   b. scientific names of plants are to be in alphabetical order;
   c. common names of plants;
   d. height and spread at maturity;
   e. plant size (including pot or container size);
   f. quantity of each species to be used.
3. The schedule should be organised and categorised according to the type of planting represented. For example: trees, shrubs, ground covers, grasses etc.
4. The planting schedule should also reflect the preferred plant species identified in the Appendices.
5. The plant species included in Appendices 1 to 5:
   a. are plant forms that contribute to the landscape character of Lockyer Valley;
   b. are not exhaustive and should not rule out the use of other plant species that meet the purpose of this planning scheme policy;
   c. introduced plant species which may be appropriate to the character of localities for landscaping;
   d. are to be selected by suitably qualified persons to ensure they are appropriate for the specific site conditions and application.
6. The plant species included in Appendix 6: Undesirable plant species:
   a. are plant species that are undesirable for a singular or number of reasons;
   b. some undesirable species may be suitable in some circumstances;
   c. suitably qualified persons should ensure species are suited to the location and type of development;
   d. are not an exhaustive list.
7. Tiered plantings

a. tiered plantings should be used where possible to maximise the effectiveness of landscaping. For example, a two-tiered planting should consist, as a minimum, a mixture of small trees and low shrubs. A three-tiered planting should consist of tall trees, medium shrubs, and groundcovers;
b. the preferred plan species tables are to be used as a guide when establishing tiered plantings;
c. the requirements and composition of tiers should be site specific.

## SC6.7.3.14 Maintenance

1. A maintenance schedule, as part of the Detailed landscape plan and Planting Schedules, should be provided for all works to be dedicated to LVRC.
2. A Maintenance schedule should consider the future use of the land and long-term maintenance of the landscaping by the end user. The maintenance schedule is directly related to landscape and plant establishment works and an integral part of the overall Landscaping plan.
3. Different zone settings may affect the maintenance standards to be applied. The following maintenance standards should be considered for the various planning scheme zones:

| Indicative Level of Maintenance | Relevant Zone |
|---|---|
| Highest level of maintenance | Open space zone; Sport and recreation zone |
| Higher maintenance | Emerging community zone; Low density residential zone; Low-medium density residential zone; Rural residential zone |
| Minimal maintenance | Community facilities zone; Local centre zone; Major centre zone; Principal centre zone; Township zone |
| Low to no maintenance | Industry zone; Special industry zone |
| No maintenance or keep close to nature for restoration or rehabilitation areas | Conservation zone; Rural zone; Limited development zone |

4. The maintenance program addressing softscape and hardscape, is to reinforce the overall philosophy and objectives of the landscape design and is to include accepted horticultural practices and best practices necessary to establish the proposed landscape works in the noted maintenance period. Such information is useful in assisting in the assessment of the proposal and to direct any future management programs.
5. As part of the maintenance schedule, the following elements should be addressed:
   a. identify the key maintenance tasks;
   b. define the type and frequency of maintenance required for each task;
   c. estimate recurrent maintenance tasks and costs.
6. The estimated costs of maintenance will be taken into consideration when bonding landscaping works.
7. The maintenance program is directly related to landscape and plant establishment works and is usually included in the accompanying specification.
8. Maintenance periods:
   a. maintenance schedules should identify timeframes for the various landscaping stages, including establishment, maintenance, on maintenance and defects;
   b. off Maintenance period commences on acceptance of final inspection at the end of the specified or approved maintenance period;
   c. periods are as follows, although these may vary according to the setting:

**Table SC6.7-8: Maintenance periods for landscaping**

| TYPE OF DEVELOPMENT | ESTABLISHMENT PERIOD | MAINTENANCE PERIOD | DEFECTS PERIOD (HARDSCAPING) | DEFECTS PERIOD (SOFTSCAPING) |
|---|---|---|---|---|
| Major development works (e.g. subdivisions creating than 5 lots, large commercial or industrial, street landscaping; screen landscaping; park works) | 3 mths | 12 mths | 12 mths | 12 mths |
| Minor development works | 3 mths | 3 mths | 3 mths | 3 mths |
| Restoration works | Refer to Planning Scheme Policy SC6.1 Biodiversity | | | |

### SC6.7.3.14.1 Water

1. Water used to establish and maintain the grassing is to have a pH of between 5.0 and 8.0, a total soluble salts concentration less than 1,000mg/L and contain no chemicals or compounds toxic to growth.

### SC6.7.3.14.2 Damaged, dead and dying plants

1. The developer is responsible for replacing all dead and dying plants that are damaged, dead or dying within the establishment period.

# SC6.7.4 Street landscaping works

1. The aim of street tree planting is to provide:
   a. an attractive streetscape with character and charm. An individual character may be obtained by using a specific tree species for each street;
   b. shade, and the reduction of heat and glare from the road pavement and assist in cooling during the summer months;
   c. habitat provision and enhancement occurs by using native flowering trees that provide a source of food and shelter for insects, birds and animals.
2. An avenue of trees of identical species and size planted at regular intervals has far greater visual and aesthetic impact than a mis-matched selection of incompatible trees. To promote continuity in new streetscapes, a single species should be nominated for each street.
3. Where development occurs in an established street, an assessment of the existing trees will assist to determine the most appropriate species for verge planting.

## SC6.7.4.1 Road types and location of the trees

**Table SC6.7-9: Strategies for street landscape typologies**

| LAND USE CATEGORY | STRATEGIES |
|---|---|
| **Non-urban** | Maintain view lines through appropriate selection of plants;<br>Plant trees to frame views;<br>Ensure new vegetation does not block views of existing features;<br>Locate new roads around significant vegetation;<br>Roads are to be widened in one direction in order to maintain roadside vegetation on a least one side;<br>Maintain wide verges incorporating drainage swales;<br>Maintain flush kerbs for natural drainage;<br>Supplement existing vegetation with informal clusters of street tree planting of native species;<br>Roundabout should incorporate native trees and shrubs;<br>Road shoulders should be grassed to enable slashing;<br>Kerb and channel and nature strips are avoided to reduce costs and maintain non-urban character;<br>Encourage wide verges with grassed or planted swales;<br>Utilise run off from surrounding property to irrigate vegetation;<br>Incorporate footpaths and cycle ways on main routes to centres and community facilities;<br>Utilise existing road side vegetation for shade to pedestrians;<br>Supplement existing vegetation with informal street tree and mass planting of native species;<br>Provide off road recreation trails on rural collector and arterial roads for safety and amenity. |
| **Urban** | Street trees are to be incorporated into the road landscape where possible;<br>Where a street contains overhead power lines, shade trees and a footpath are to be located on the opposite side of the street;<br>Encourage the provision of wider verges or medians where possible to allow for street tree planting;<br>Utilise drought tolerant native plants;<br>Utilise low maintenance plants that do not require regular pruning;<br>Discourage the use of high fences adjacent to street so as to optimise surveillance and access from adjacent residential development to the street;<br>In locations where fences are required, mitigate the visual impact through landscape planting treatments;<br>Provide pedestrian permeability at the end of cul-de-sacs with casual surveillance;<br>Maintain native vegetation in new developments where possible;<br>Reinforce existing native vegetation by planting indigenous species;<br>Improve access to community facilities with appropriate streetscape treatment and pedestrian access;<br>Define local identity through gateway tree planting and neighbourhood parks;<br>Provide shaded paths on at least one side of every street for pedestrians;<br>In existing development where wide verges are present, incorporate grassed or planted swales;<br>In new development, incorporate flush kerbs with bollards for water drainage into streetscape bioretention systems. |
| **Industrial** | Retain appropriate vegetation in new developments;<br>Incorporate large scale street trees in road verges and kerb build outs;<br>Utilise planted medians;<br>Provide appropriate locations for bus stops with shade and seating;<br>Provide shaded pedestrian and cycle paths integrated with public transport routes; |

| | |
|---|---|
| | Incorporate wide verges for planted swales and detention basin in new development;<br>Incorporate storage for appropriate water reuse;<br>Incorporate localised detention basins in existing development where possible;<br>Utilise flush kerbs and swales to roadside for streetscape bioretention systems |
| **Centres** | Reduce car priority and road speed by reducing lane widths an increasing verge widths to allow for tree planting;<br>Combine street tree planting with other street furnishings such as seating and lighting;<br>Utilise street tree species that contribute to the character of the centre;<br>Create a streetscape that highlights the natural and cultural qualities of the local area to establish a strong identity;<br>Use drought tolerant plants;<br>Use low maintenance plants that do not require regular pruning;<br>Incorporate street trees into the street landscape to achieve continuous cover of the tree canopy over the footpath at maturity;<br>Widen verge space and incorporate kerb build outs or medians where possible to allow for street tree planting;<br>Convert existing garden beds into localised detention basins by breaking through kerbs in low points for water drainage into garden beds;<br>Incorporate permeable paving into hard stand areas;<br>Provide for irrigation from tank supply and or passive collection of runoff. |

## SC6.7.4.2 Design principles

1. The six key principles for landscaping works: Safety, Resilience, Environment, Character, Community and Economics apply to all road types. The principles should be used to guide applicant on the expected standards to be achieved when developing future road reserves, and improving existing road reserves. Promote consistent management and implementation of renewal strategies that are consistent with the guidelines.

## SC6.7.4.3 Design specifications and standard drawings

1. Streetscaping must be incorporated into landscaping within the verges or medians of new roads in a subdivision. Detailed working plans of the landscaping must be lodged with the engineering documentation as part of an Operational Works application.
2. Design must satisfy the following criteria:
   a. planting is in scale with streetscape;
   b. street trees are not planted within 6m of light poles;
   c. plants are not placed at access points;
   d. plants must not obstruct access to services;
   e. planting has limited species variation;
   f. earthworks are not carried out within proximity of existing vegetation;
   g. all street gardens including roundabouts and medians must be provided with an automatic irrigation system;
   h. subsoil drainage must be provided between all street gardens and the road pavement;
   i. pedestrian access must be maintained around, and where applicable through, all street planting;
   j. visibility lines ensure that the minimum stopping distance for vehicular traffic is maintained, assuming the plantings have grown to full maturity.
3. Works must also incorporate:
   a. stabilisation of unstable slopes with retainer wall treatments and revegetated appropriately;
   b. stable slopes will be rehabilitated using minimal maintenance grasses and/or revegetation techniques;
   c. road verges including table drains in rural areas are grassed with a minimum aerial coverage of 80 percent before acceptance off maintenance. The grass coverage must also have been significantly established and maintained for a minimum period of twelve months before acceptance off maintenance. Bank slopes of drains to be no steeper than 1 in 6 where this can be accommodated and where there is insufficient space, no steeper the 1 in 4 (also refer the Queensland Urban Drainage Manual). Turfed areas are to be accessible by industry standard mowers and shaped in such a way as to accommodate these machines;
   d. acoustic barriers to be provided for all new roads with design traffic greater than 5,000 AADT where the abutting properties are residential and have an average lot area less than 2,000m$^2$.
4. Roundabouts and large traffic islands must only include feature landscaping within higher profile roads, refer to IPWEAQ Standard drawings:
   i. PSD-101 Street Trees - Street Tree Planting Details - Including Root Barrier;
   ii. PSD-102 Street Trees - Street Tree Planting Details - Wide Median;
   iii. PSD-103 Street Trees - Street Tree Planting Details - Narrow Median.
5. Typically, full area decorative concrete finishes should be used for smaller and/or lower profile traffic islands, roundabout and traffic calming.

6. Large roundabouts to include a maintenance vehicle set down pad as one of the design features.
7. All roundabouts to have a 1.5m wide decorative concrete surround (to provide improved buffer zone between maintenance workers and traffic).

### SC6.7.4.3.1 Edging

1. Edging shall be installed in accordance with the relevant standards at the interface of grassed and mulched landscape areas (excluding individual trees and remnant natural vegetation). A concrete edge shall be constructed around gardens and landscape beds where there is no adjacent wall, pathway and/or pavement area. The concrete edge kerbing shall be constructed in accordance with IPWEAQ Standard drawing, RSD-200 Kerb & Channel - Profiles and Dimensions - Including Edge Restraints, Median & Channel, Type ER4.
2. A timber edge can only be installed where the tree and shrub canopy will extend well beyond the mulched edge as plants mature. For example, a timber edge is acceptable around habitat rehabilitation areas, and landscaping that includes a prominent tree canopy (natural areas), but not garden beds.
3. Mulched areas that adjoin grassed areas shall be shaped to allow easy mowing by tractor-drawn mowing equipment. The edging shall be straight, or with long sweeping curves. Corners shall be between 45º and 90º. Acute corners and repetitive short radius (snake-like) bends shall be avoided.

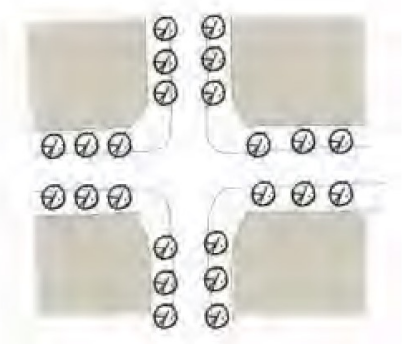
### SC6.7.4.3.2 Entry statements

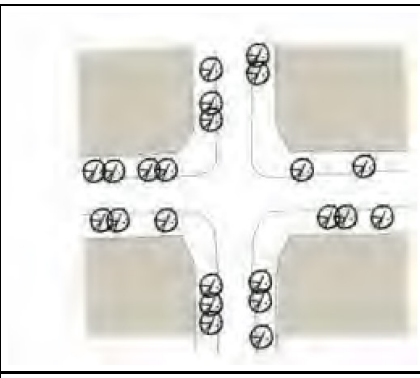
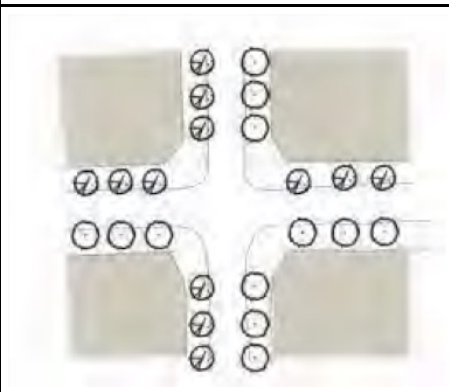
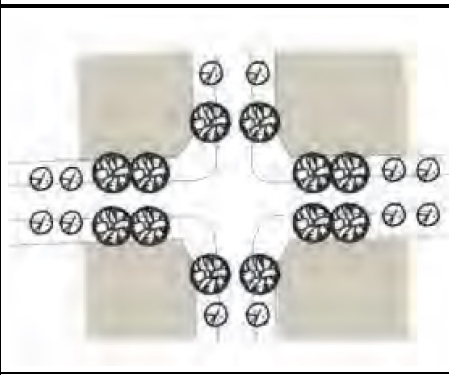
1. Entry statements or signage and the planting associated with these are to be:
   a. contained within the private land of the developments. Including land that is planned future Council controlled land; or
   b. on existing or future Council controlled land where there is an established private maintenance agreement and at the finalisation of the development, such planting is removed, and turf established (at no cost to Council) before final handover to Council.
2. Where an entry statement involves structures over 1m high or retaining walls or other works or landscaping, provide detailed design drawings showing all works and services needed for the entry statement. All drawings of all structures, including retaining walls must be certified by an RPEQ competent in structural design of such structures.
3. All entry statements must be designed as low maintenance structures.
4. The Council reserves the right to remove any entry statement without notice once the development has been completed.

## SC6.7.4.4 Verge design standards

1. Verges designs are to provide a consistent, functional and attractive streetscapes and:
   a. provide a high standard of landscape design;
   b. encourage landscaping appropriate to the local context by introducing a location-based planting approach;
   c. reduce heat island effect in urban areas;
   d. provide landscaping that can be effectively maintained;
   e. minimise conflicts with infrastructure, services and other Council's assets.
2. This section introduces general requirements for offsets and clearances for street tree placement and landscaping. The final placement of trees must consider relevant guidelines from Austroads and DTMR Road landscape manual (where appropriate).
3. Council may consider variation to these requirements if it can be demonstrated that the placement of the tree will not impact on existing infrastructure or compromise the safety of road users and pedestrians.

**Table SC6.7-10: Street design configuration**

| DESIGN | DESCRIPTION | EXAMPLE |
|---|---|---|
| **Formal** | Single species at regular intervals suitable for urban and core setting with large road frontages and uniform street conditions. |  |

| | | |
|---|---|---|
| **Informal** | Single or mix of species at irregular intervals. Planting to single verge or both sides of the carriageway dependent on road type. Suitable for urban, transition and rural setting. |  |
| **Asymmetrical Planting** | Combination of species planted at regular intervals. Suitable for roads with limited space (width or height) due to placement of infrastructure e.g. powerlines. |  |
| **Feature Planting** | Use of local and/or exotic species to highlight key areas like intersections, roundabouts, estate entries which are highly visual. |  |

### SC6.7.4.4.1 Verges and medians

1. All existing and proposed street trees in verges are to be shown on the landscaping plan.
2. For existing verges less than 1.6m in width, Council is to be contacted during the concept planning stages to discuss suitable species for street trees. Street trees are best suited for verges greater than 1.6m width (refer to IPWEAQ Standard drawings, PSD-101 Street Trees - Street Tree Planting Details - Including Root Barriers). Table SC6.7-11: Minimum width requirements for planting areas outlines the appropriate landscaping treatments.

**Table SC6.7-11: Minimum width requirements for planting areas**

| LOCATION | MINIMUM WIDTH | LANDSCAPE TREATMENT |
|---|---|---|
| **Street verge planting** | Less than 0.6m | Hardscaping |
| | 0.6m—1.2m | Turf or groundcovers |
| | 1.2m—2m | Small to medium trees |
| | More than 2m | Medium to large trees |
| **Median planting** | Less than 0.6m | No landscape treatment.<br>Median to be paved or concrete infilled |
| | 0.6m—1.2m | Turf or groundcovers |
| | 1.2m—2m | Shrubs and small trees<br>Centrally located in the median |

| | | |
|---|---|---|
| | More than 2m | Medium to large trees<br>Centrally located in the median |

3. All verges are to be covered full width with topsoil to a depth of not less than 100mm and be lightly compacted and grassed or turfed.
4. As a minimum all rural verges are to be in a mowable condition, free from rocks and loose stones, and graded to even-running contours. Where higher levels of pedestrian activity the turf should be have an even and smooth surface suitable for walking without risk of trips and falls.
5. Where there is a small area for landscape planting on the verge between the property boundary and a footpath, planting may be accepted as an alternative to turf subject to Council approval.
6. Tree planting within the verge is to be clear of underground services.
7. Understory planting (small shrubs, ground covers and grasses) shall be typically less than in 600mm high.
8. Understorey planting should consist of mulched planted areas consisting of:
   a. small shrubs no greater than 2m apart;
   b. groundcovers no greater than 1m apart.
9. Council will not be held responsible for plant replacement if excavation of underground services in required in a landscaped verge. Maintenance of landscape planting in the verge is the sole responsibility of the adjacent property owner or occupier.
10. Medians suitable for low level landscaping to be minimum 2m wide. The tree canopy width is to match median width or be a maximum of 6m wide whichever is smallest (canopy must not extend beyond median width)
11. Provide a minimum 500mm wide mulch strip from back of kerb for ease of maintenance access Include design guidelines from Street trees guide.
12. Trees under overhead power lines to be maximum height of 4m and must follow Energex Safe Tree Planting Guidelines.

### SC6.7.4.4.2 Set out from kerb

1. Street trees are planted 650mm from the back of kerb for verges up to 4.25m wide, and 850mm from the back of kerb verges greater than 4.25m wide in accordance with IPWEAQ Standard drawings:
   a. RSD-601 Public Utilities - Typical Service Corridors & Alignments;
   b. RSD-602 Public Utilities - Typical Service Conduit Sections;
   c. RSD-603 Public Utilities - Optic Fibre Pit.
2. Street tree setback from kerb is greater for industrial streets, to accommodate the prevalence of larger vehicles along the kerbside.
3. The location must accommodate the ultimate size and shape of the tree.
4. Street trees in areas that do not have a kerb are located a minimum of 1.5m from shoulder edge of the road seal.

### SC6.7.4.4.3 Planting frequency

1. In the centre zones - one street tree is planted for every 10m along road frontages provided.
2. In other urban areas and rural residential areas - one street tree is planted for every 15m along the frontages of the site.

### SC6.7.4.4.4 Planting locations

1. Tree planting is to be consistent with IPWEAQ Standard drawings:
   a. PSD-101 Street Trees - Street Tree Planting Details - Including Root Barriers;
   b. PSD-102 Street Trees - Street Tree Planting Details - Wide Median;
   c. PSD-103 Street Trees - Street Tree Planting Details - Narrow Median;
2. The location and placement of street trees is measured from the tree's base and estimated ultimate trunk size.
3. Table SC6.7-12: Separation distance between street trees and road furniture provides the setbacks that apply to tree placement as a minimum. These dimensions may be varied depending on the speed of the road and other site-specific constraints.

**Table SC6.7-12: Separation distance between street trees and road furniture**

| ROAD ELEMENT | DESCRIPTION | SEPARATION DISTANCE |
|---|---|---|
| **Intersection** | distance from projected line of the intersecting kerb line on approach side | 15m |
| | distance from projected line of the intersecting kerb line on non-approach | 7m |
| **Clear zones** | NO tree planting within areas identified as clear zones. | 0.5m |

| | | |
|---|---|---|
| | Sightlines maximum mature height of vegetation directly on triangle sightlines | |
| **Stormwater inlet pit** | distance from nearest edge of pit structure | 2m |
| **Paths or garden edges** | minimum distance from path or garden edge | 0.6m |
| **Traffic light** | distance from signal pole | Greater than 10m |
| **Pedestrian crossing** | distance from outer edge of crossing on either side | 15m |
| **Streetlight** | minimum horizontal distance from pole to mature canopy edge | 5m |
| **Street signs** | horizontal distance from a road sign on approach | 10m |
| | horizontal distance from a road sign on departure | 3m |
| **Bus stops** | distance from bustops on approach | 20m |
| | distance from bustops on departure | 6m |
| **Power lines; pad mounted transformer; fire hydrants; Telecommunication poles or pillars** | maximum height of mature planting located under powerlines | 4m |
| **High voltage transmission lines** | Minimum clearance under transmission lines | Greater than 4m |
| **Tree trunk** | vertical clearance from underside of canopy to top of horizontal surface | 2.5m |
| **Access crossover** | distance from any part of the access crossover | 3m |
| **Property service connections (e.g. roof drainage, gas, sewer, water, telecommunications or electricity)** | distance from | 1.5m |

4. Landscaping plantings near intersections, pedestrian facilities and bus stops are to be limited to low plantings (species that do not grow higher than 500mm) to ensure visibility of sight lines of motorists and pedestrians are not restricted.
5. Figures SC6.7-1 to SC6.7-3 graphically represent some of the required clearances for street tree planting along the verge and the median. Clearances must be confirmed for each planting project depending on actual site constraints.
6. Practices that disfigure the shape of the tree must be avoided to ensure it can grow in a healthy and safe condition. The intention of the following layout considerations is to maintain consistency and uniformity across the region these layout considerations apply to all road types regardless of urban setting.
7. Single street trees are planted at a spacing no less than one for every 6m of allotment frontage. Clusters and pairs of trees are at minimum 2m centres.
8. Large-crown feature trees are planted in areas no smaller than 7m x 6m, at minimum 10m spacing.
9. Upright feature trees are planted in areas no smaller than 5m x 5m.

**Figure SC6.7-1: Clearance zone along street verge**

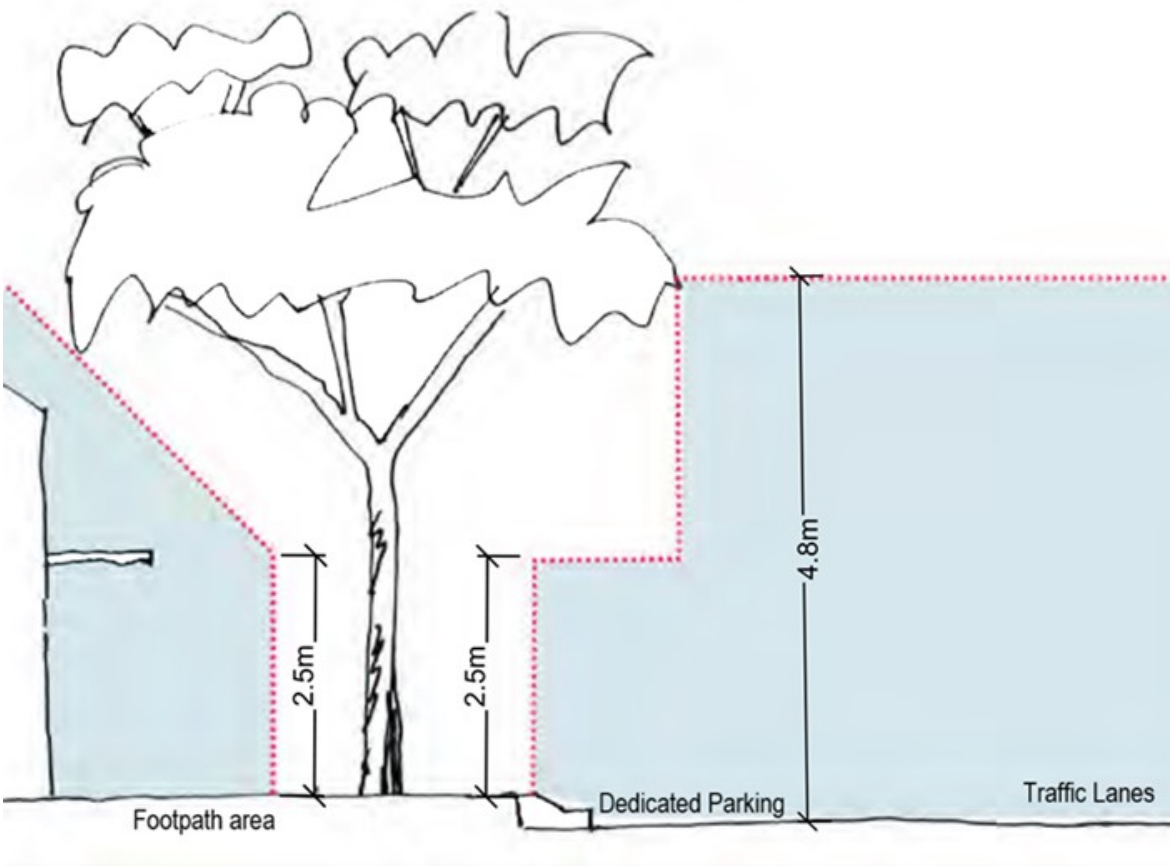



**Figure SC6.7-2: Clearance zone along street medians**

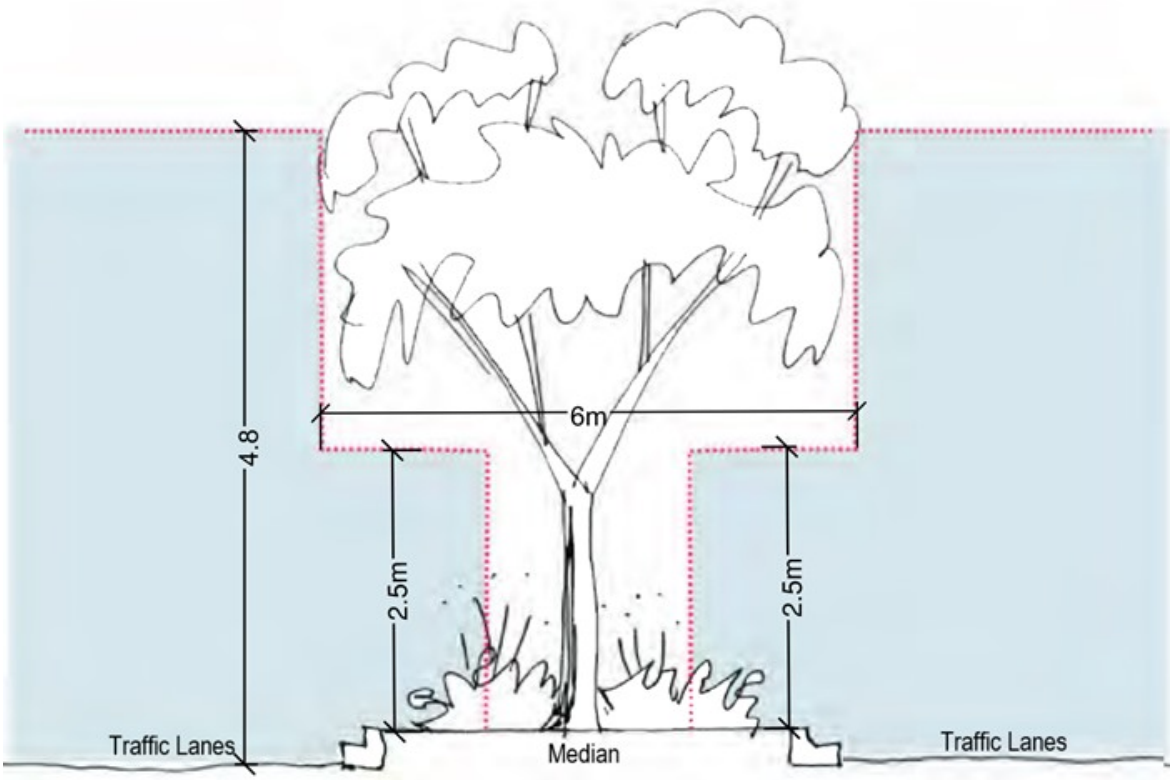
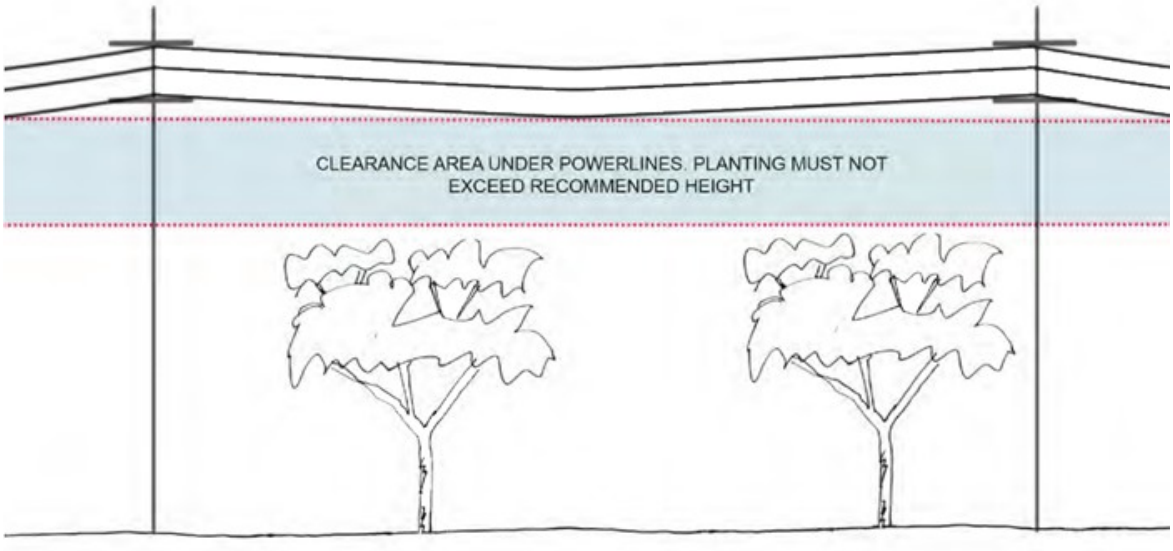



**Figure SC6.7-3: Clearance zone under powerlines**




## SC6.7.4.5 Existing and replacement street trees

1. Existing street trees are to be retained and protected unless removal is approved by Council.
2. Replacement street tree planting is to achieve a no net canopy areas loss.

3. Developers are to work with Council to accommodate any other proposed construction works around existing street trees.

## SC6.7.4.6 Species

1. The recommended plant species have been incorporated due to their suitability to the region's soils and microclimates. The list focuses on native species due to their habitat advantages. The selection of plants provided cover a range of applications such as conservation, habitat, urban setting, visibility, frangibility and low maintenance to name a few.
2. Plants not included in the list may be considered upon review by Council for their application, environmental benefits to the area and ensuring they meet the associated road safety requirements. Other characteristics required for appropriate tree selection are aspect, drainage, overhead wires, underground services, setbacks from buildings and hard elements.
3. Determining the space available for planting is essential in the selection of the most suitable species for the road reserve planting.
4. Consideration of the mature height and canopy of the trees is paramount when designing a new road and/or refurbishing an existing road.
5. Tree species to be used generally are listed in Appendix 3: Preferred street tree species. Tree species are to be selected for their suitability to the site conditions (e.g. small trees under power lines, drought resistance, soil suitability).
6. Plant species to be used in specific townships are listed in Appendix 4: Town streetscaping.
7. Plants are to have a consistent growth rate and form in accordance with AS 2303 Tree stock for landscape use.

## SC6.7.4.7 Planting

### SC6.7.4.7.1 Tree pits

1. All tree planting must be in natural or improved soil profiles containing subsoil layers.
2. Trees must have adequate soil quality and quantity to grow to their optimum within the particular location.
3. The location of existing services should be verified before excavating the tree hole. Consideration must be given to the location of underground services, street lights, and traffic signs.
4. Tree pits should be a minimum of 1m deep with a 1.2m x 1.2m square from the back of the kerb, where there is no companion planting bed is not provided.
5. Where a companion planning bed is to be provided, the excavated area is to be a minimum of 1.2m wide from the back of kerb with a minimum length of 2m but not more than 3m.

*Note—Planting on the verge does not contribute to the calculation of deep planting required on private property.*

### SC6.7.4.7.2 Irrigation

1. Reticulated irrigation is discouraged unless provided for the tree establishment period only and sourced from non-potable water.

### SC6.7.4.7.3 Root barriers

1. Root barriers are to be positioned on either side of the street tree where there is a footpath, or the tree is within 2m of services, sewer and infrastructure (refer to IPWEAQ Standard drawing, PSD-101 Street Trees - Street Tree Planting Details - Including Root Barriers).
2. Root barriers are not used as a response to bad species choice or inadequate root zone space.
3. Root barriers deflect roots, and do not work unless the top side of the deflective is above the surface.

### SC6.7.4.7.4 Street tree with bioretention

1. Street trees that have bioretention system are required for full-width pavement verges.
2. Street trees that have bioretention system designed and constructed in accordance IPWEAQ Standard drawings:
   a. DSD-508 Bioretention - Bioretention Street Tree;
   b. DSD-509 Bioretention - Bioretention Standard Notes.

### SC6.7.4.7.5 Tree planting surrounds

1. The streetscape type determines whether trees are to be planted in mulch, garden beds, tree grates, or permeable and porous paving.

### SC6.7.4.7.6 Implementation

1. For all streetscape works tree planting other than tree planting for new roads, developers must undertake planting and maintenance.
2. A road reserve landscaping plan for newly constructed roads showing existing and proposed trees, location of streetlights, driveways, services etc., should be submitted and approved (before planting) by Council. The minimum stock size, quality of plants, planting and after care should conform to Council requirements.
3. When the planting is completed, the developer is to notify Council in writing and request an inspection to place the trees on maintenance.
4. To allow for early plan sealing, Council may accept an uncompleted works bond for the supply and planting of street trees for new roads. Prospective purchasers must be provided a landscaping plan that shows the location where new street trees will be planted.
5. Trees damaged or deceased within the maintenance period or the duration of development, whichever is the longer, must be replaced.
6. Preferred street tree species are listed in Appendices 3 and 4.

### SC6.7.4.4.7.7 Pruning and maintenance

1. Pruning is grouped into different categories depending on the growth stage of the tree, the type of pruning, and when it is carried out:
   a. shaping;
   b. maintenance;
   c. restructuring;
   d. pruning of palm trees.
2. **Shaping:** the tree after planting seeks to encourage proper growth.
3. **Maintenance:** pruning keeps street trees healthy.
4. **Restructuring:** involves a reduction in the size of the crown when branches are diseased or damaged or when they are lopsided or misshapen.
5. **Pruning of palm trees:** is a special maintenance technique. It is limited to removing dry fronds, suckers, inflorescences and fruits, while respecting the natural spherical shape of the crown.

**Table SC6.7-13: Pruning and maintenance of street trees**

| TYPE OF PRUNING | GROWTH STAGE | PURPOSE OF PRUNING | TIME OF PRUNING |
|---|---|---|---|
| **Shaping** | For 3 years after planting | Lifting and narrowing of crown<br>Cleaning | All year (preferably in the dormant season) |
| **Maintenance** | After 4 years | Cleaning and care<br>Thinning<br>Safety | All year (preferably in the dormant season) |
| **Restructuring** | Adult trees | Reduction and reshaping of crown | All year (preferably in the dormant season) |
| **Palm trees** | For 2 years after planting | Cleaning and care<br>Safety | All year except during the hottest months to avoid palm weevil infestation |

# SC6.7.5 Screen landscaping

1. The purpose of this section is to:
   a. provide guidance on the design and construction of screen landscaping under the planning scheme;
   b. where an applicant proposes an alternate solution, it should demonstrate that the proposed solution effectively achieves the design features of the required screen landscaping type, as specified in Appendix 5: Screen landscaping species;
   c. provide guidance for the design, construction and ongoing maintenance of screen landscaping to minimise conflicts between agricultural operations and sensitive land uses (e.g. residential uses and urban development);
   d. inform the design of new residential development adjacent to agricultural land uses in order to limit impact on lawful agricultural operations;
   e. provide appropriate design considerations and maintenance advice to ensure screen landscaping is effective in mitigating off site impacts adjacent to sensitive land uses;
   f. support applicants in satisfying the requirements of the planning scheme;
   g. assist development assessment officers in their assessment of new development applications that require screen landscaping.

***Editor's note—Council will consider this policy where a proposal adjoins an existing agricultural activity, and when adjoining land that could foreseeably be used for agriculture, including land identified as ALC Class A and B or within the Rural zone.***

## SC6.7.5.1 What is a screen landscaping?

1. Screen landscaping is commonly used as part of effective land use planning and conflict management against incompatible land uses. Screen landscaping provide an area of separation between conflicting infrastructure (e.g. state-controlled road), rural or industrial activities and residential activities or sensitive land uses. Screen landscaping is vegetated to form a physical and visual barrier.
2. Infrastructure, rural or industrial activities are sometimes regulated by specific environmental laws and codes. Regulations vary between activities may seek to protect environmental values rather than character or amenity where residential and sensitive land uses may be adjacent. The requirement for screen landscaping on the encroaching land use is sometimes an effective method of mitigating impacts on character or amenity.
3. Infrastructure, rural or industrial activities may generate various off-site impacts such as dust, smoke, ash, noise, smell, light, contaminants, chemical spray drift and irrigation overspray. These off-site impacts may be intermittent, seasonal or continual.
4. Where development for a residential activity or sensitive land use is introduced into an area where Infrastructure, rural or industrial activities exist then the residential activity or sensitive land use should include screen landscaping to mitigate the risk to amenity, health and safety that may arise from established Infrastructure, rural or industrial activities.
5. Screen landscaping is incorporated into the design of the proposed development to limit impacts to the existing activity and future activity.
6. Screen landscaping design, size and suitability will vary depending on the existing activity and impacts it is mitigating. This policy provides design considerations and provisions to ensure a screen landscaping is suitable and effective for its context.
7. Screen landscaping is intended to:
   a. reduce the visual impact of adjacent development or infrastructure by screening;
   b. reduce the acoustic impact of the infrastructure using noise attenuation barriers;
   c. introduce a 'natural' vegetated landscape appearance by replacing open agricultural land with an area of dense planting;
   d. reinforce the local character by using native tree and shrub species;
   e. provide additional functions, such as:
      i. mitigate the dispersal of odour and dust;
      ii. provide a physical barrier to reduce the impact of pressure waves or explosion;
      iii. provide shade over adjacent pedestrian and cycleways.

## SC6.7.5.2 Tenure and responsibility

1. Once screen landscaping is established, they are to be protected by a defined tenure arrangement and responsibility for ongoing maintenance.
2. The preferred tenure hierarchy of the ownership, management and responsibility of screen landscaping is as follows:
   a. developer owned (e.g. within a balance parcel);
   b. owned by the sensitive land use (e.g. within private residential lot);
3. Council trustee or ownership.
4. Screen landscaping should be protected by way of legislative instrument tied to the title (e.g. covenant placed on the title)

of land and remain the responsibility of the landowner.

5. Ongoing maintenance requirements should be imposed by way of development approval conditions and property covenant.
6. Where screen landscaping is proposed within land to be dedicated to Council (i.e. road reserve, open space or drainage corridor) it will be the responsibility of Council.
7. Mounds and buffer landscaping adjacent to rural or industrial activities or infrastructure including state-controlled roads are to comply with the planning scheme requirements or condition by a relevant State Agency. Buffer landscaping is to be 10m wide along the full length of the interface with the infrastructure or road.
8. Screen landscaping is to be in designed in accordance with 7.5.1.3 Attributes.
9. The species mix should incorporate a range of plants providing variety in form, colour and texture, to contribute to a natural appearance. The front line of planting should have foliage down to ground level.
10. Buffer mounds are to have a permanent irrigation system is to be installed. Permanent irrigation systems are to be below the surface of the mulch (i.e. a drip-style irrigation) to reduce the chances of vandalism and reduce excess water loss due to runoff or evaporation.
11. Some species used as street or shade trees in the development are to be included in the screen landscaping to create a recognisable character that is reinforced by repetition (refer to Appendix 3: Preferred street tree species and Appendix 4: Town Streetscaping).
12. Use of disciplined plant selection based on themes such as colour, texture, or natural species associations, in addition to site suitability, creates higher quality landscapes than random assortments of nursery stock chosen solely for short notice availability and growth suitability.
13. Local species, which typify and reinforce the region's image, are preferred. Most are hardy, long-lived and will reduce long-term maintenance.
14. The landscaping is to be designed so as not to create a safety risk to people using the adjacent areas (i.e. no thorns, heavy nuts or poisonous fruits or berries).
15. Large shade trees to be planted no higher than a third from the base of mound (i.e. no trees are planted on top of the mound).

## SC6.7.5.3 Attributes

1. This section outlines the general attributes that need to be considered when designing and implementing a screen landscaping, including screen landscaping height, width, density and length.

**Figure SC6.7-4: Buffer height of screen landscaping**

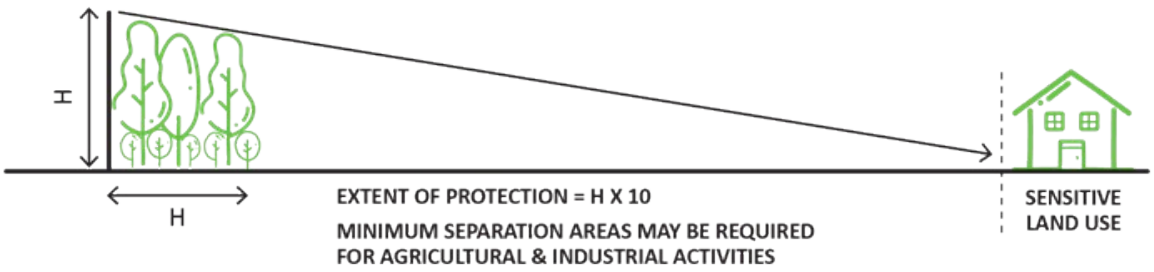



**Figure SC6.7-5: Buffer density of screen landscaping**

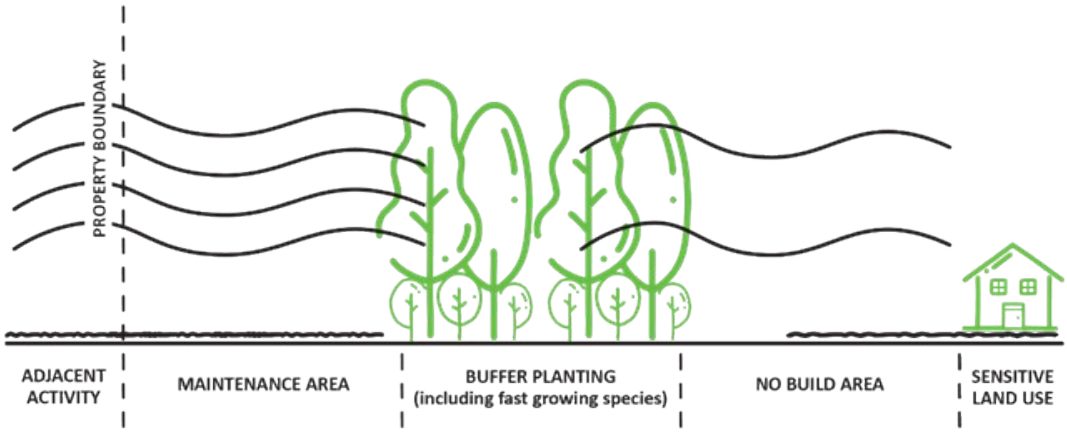
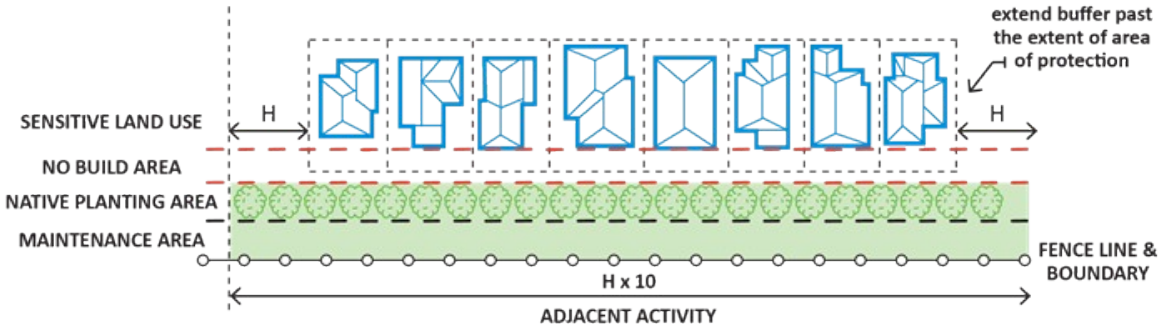



**Figure SC6.7-6: Buffer length of screen landscaping**




2. Screen landscaping design is influenced by the existing operations that can generate off site impacts on adjacent land. Adjacent activity refers to the land use and activity that is occurring adjacent to the encroaching sensitive land uses. This may include infrastructure, rural or industrial activities etc.
3. Various rural and industrial activities have divergent off-site impacts that need to be considered when designing screen landscaping that are suitable and effective.
4. The tree mix is to include species used in adjacent road reserves or as street or shade trees within the development are to be included in the screening or buffer landscape to create a recognisable character that is reinforced by repetition.
5. Local species is to be dominant character of the species mix to reinforce the regions image.
6. The landscaping is to be designed so as not to create a safety risk to people using the adjacent areas (i.e. no thorns, heavy nuts or poisonous fruits or berries).
7. An irrigation system is to be installed and utilised until the full establishment. Irrigation system are to be below the surface of the mulch (i.e. a drip-style irrigation) to reduce the chances of vandalism and reduces excess water loss due to runoff or evaporation.
8. Maintenance area refers to the strip of turf and/or low grasses that is directly abutting the adjacent activity and allows access to the boundary fencing and screen landscaping for maintenance. This area also provides appropriate separation from the adjacent activity (infrastructure, rural or industrial activities) and assists in managing potential fire hazards.
9. No build area refers to the area between the screen landscaping and the sensitive land use (development) which is to remain free of infrastructure and any built structures above or below ground.

## SC6.7.5.4 Types

1. Selecting the most appropriate and effective screen landscaping type depends on the stage of development, land use, and type of infrastructure, rural or industrial activities that is occurring on the adjacent land. Screen landscaping fall into two main categories: Static or Transitional screen landscaping.

2. A static screen landscaping is:
   a. located as a permanent screen landscaping between infrastructure, rural or industrial activities, and an urban or rural residential area;
   b. multi-layered with staggered rows of trees and shrubs to provide protection from the rural or industrial activity and increase the visual amenity and aesthetic of the screen landscaping;
   c. comprised of various species of trees and shrubs. Planting should be established at a density relative to the adjacent use or activity.
3. A transitional screen landscaping is:
   a. located on a transitional development front rather than a defined a peri-urban edge;
   b. used to provide interim screen landscaping and separation between a staged urban or rural residential development and an existing rural or industrial activity;
   c. to protect existing rural until the land is developed for urban uses;
   d. temporary and requires vegetation to be established quickly to provide effective protection to the sensitive land use from the adjacent rural or industrial activity;
   e. comprised of fast-growing species to establish a visual screen and physical barrier to mitigate against amenity impacts and airborne particulates from the rural or industrial activity.

**Table SC6.7-14: Screen landscaping types**

| SCREEN TYPE | APPLICABLE CONTEXT | DESIGN FEATURES | MINIMUM HEIGHT | MINIMUM WIDTH | MINIMUM LENGTH |
|---|---|---|---|---|---|
| Type 1 | Adjacent to cropping including forestry (i.e. horticultural) and rural activities | Achieve a lower density of planting within the tree and shrub zone<br>Achieve two staggered rows of planting to lessen competition between planting | Designed to achieve a minimum height of 8m to 10m | 5m | To achieve mitigation of receptor |
| Type 2 | Adjacent to cropping (i.e. orchards) and other dust or odour generating activities | Achieve a higher density of planting within the tree and shrub zone<br>Achieve three staggered rows of planting to increase competition between planting | Designed to achieve a minimum height of 10m to 12m | 10m | To achieve mitigation of receptor |
| Type 3 | Adjacent to infrastructure and Industrial activities<br>Adjacent to special industries | Use fast-growing plant species to establish a visual screen<br>Achieve a higher density of planting within the tree and shrub zone<br>Achieve three staggered rows of planting to increase competition between plantings<br>No requirement for additional planting but is accepted when static | Designed to achieve a minimum height of 8m to 10m | 10m | To achieve mitigation of receptor |
| Type 4 | Adjacent to sensitive land uses or non-industrial zoned lot or rail corridor o State controlled road. | Achieve a lower density of planting within the tree and shrub zone<br>Achieve two staggered rows of planting to lessen competition between planting | Designed to achieve a minimum height of 10m | 10m | A minimum of 50% along boundary where site borders |
| **Other elements** | | | | | |
| Maintenance area | All screens and buffers | turf and/or low grasses to achieve access for maintenance requirements and resilience following | | 10m | |

| | | | | | |
|---|---|---|---|---|---|
| | | maintenance operations. | | | |
| Native planting area | | consisting of 3 staggered rows of planting | | 10m | |

*Note—A landowner may amend the characteristics of screen landscaping type if the adjacent rural or industrial activity changes or new practices and operational off-site impacts occur. The screen landscaping may evolve its design to provide more effective mitigation. For example, a screen landscaping may be established to mitigate off site impacts from cropping and have a lower plant density. If the rural or industrial activity changes from cropping to orchards, the screen landscaping density may be increased to provide more effective protection.*

*A landowner may remove the fast-growing screen landscaping if it causes nuisance (e.g. noise or vermin) only when the native vegetation component of the screen landscaping is fully established (i.e. height and density). The fast-growing screen landscaping must be replaced with an additional row of native vegetation to ensure the width of the vegetated area of the screen landscaping is retained.*

## SC6.7.5.5 Recommended plant species

1. The plant species of a screen landscaping is related to the type of infrastructure, rural or industrial activities, so that the impacts can be effectively mitigated.
2. Using native species within a screen landscaping is advised as these perform better in the local conditions and require less maintenance. Effective screen landscaping growth resulting from the use of native species can also result in less pest and disease attack within these screen landscaping due to their local adaptation.
3. Species used for screen landscaping must be able to achieve branching from their base through the full height of the plant to achieve the visual screen requirements.
4. Plant species with insignificant flowers and fruits are preferred as they attract less amounts of birds, bats, or other wildlife that may in turn feed on, or adversely affect the adjacent crop.
5. A mixture of species is recommended to be planted within screen landscaping to provide a variety of plant shapes and increase screen landscaping aesthetic. Varied plant shapes also reduce the likelihood of gaps within the screen landscaping which mitigates infiltration of particulate matter.
6. Screen landscaping is to be established in accordance with the recommended plant species shown in (refer to Appendix 5: Screen landscaping plant species).
7. Other plant species from Appendices 1 to 4 should also be considered where the location is appropriate (e.g. saline soils).

## SC6.7.5.6 Establishment

1. Screen landscaping is required to be planted in accordance with the below any other approvals are granted or endorsement of a plan of subdivision is completed.
2. Fast growing screen species should be established first and in two staggered rows 10m from the property boundary of the infrastructure, rural or industrial activities and achieve a uniform screen.
3. Tree and shrub planting would be installed as tube stock to promote maximum potential growth and establishment to allow the appropriate density to be achieved for the screen landscaping classification.
4. Lower density planting should establish two staggered rows of trees, with shrubs and groundcover planting.
5. Higher density treatment requires three rows of staggered tree planting. Layered tree planting is to be inter-planted with shrubs.
6. Groundcovers should be established on the outer edge to assist in the containment of weeds and other contaminants that may encroach into the planted area.
7. Pioneer tree species are to be established in conjunction with the tree planting to achieve plant densities in less time. Over time, planting of additional trees and shrubs may be required to replace these pioneer species.

## SC6.7.5.7 Maintenance

1. The establishment of screen landscaping planting, like any other cover crop, requires watering, fertilising and weeding. Following establishment, maintenance is required to all screen landscaping types for them to remain effective. Screen landscaping should be appropriately designed and constructed to avoid time consuming and costly maintenance requirements, whilst achieving their maximum desired effect of mitigating land use conflicts. Screen landscaping maintenance includes:
2. Maintaining the required screen landscaping characteristics such as height, width, length, and density of each screen landscaping type is required to ensure the effectiveness of the screen landscaping is maintained.
3. Screen landscaping requires pruning and thinning on an annual basis to maintain a 50% density so that their effectiveness is maximised.
4. Screen landscaping is required to be watered during dry periods to maintain good screen landscaping growth.
5. Mulch levels are to be maintained to reduce weed growth and retain moisture.
6. Fertilising before the growing season will assist in maintaining the health and vigour of the screen landscaping.

7. Screen landscaping requires maintenance and management in terms of litter build up, noxious weed and pest control. Screen landscaping should remain weed free to prevent the build-up of weed species that can cause infestation of infrastructure, rural or industrial activities or operations areas as well as other neighbouring land uses.
8. Appropriate access strips are provisioned for on either side of the screen landscaping to allow for maintenance activities to be carried out.
9. Ongoing maintenance such as replanting may be required over time to maintain screen landscaping characteristics.

## SC6.7.5.8 Establishment and maintenance periods (Screen Landscaping)

1. The developer is responsible for the establishment of the screen landscaping.
2. The establishment and maintenance periods for a screen landscaping is 2 to 5 years.
3. The developer must arrange annual inspections to be undertaken by Council officers to ensure ongoing establishment and maintenance requirements are being carried out.
4. After initial planting, the screen landscaping is to be on-maintenance for a minimum period of 2 years. During this time, the screen landscaping must be maintained to ensure it is establishing well, actively growing, kept fertilised, provided with mulch, watered and weeded as necessary.
5. Annual monitoring reports and maintenance logbooks should be submitted to Council, including photos of both sides of the screen landscaping.
6. Council will undertake an inspection at the end of the 2-year establishment period.
7. Before the screen landscaping is accepted On-Maintenance:
   a. a minimum of 40% permeability has been achieved by the screen landscaping;
   b. permeability measurements will be taken at heights of 2m and 4m;
   c. weediness of screen landscaping is no more than 10%.
8. Once Council has confirmed the screen landscaping has been properly established, the screen landscaping can be accepted On-Maintenance.
9. Before the screen landscaping is accepted Off-Maintenance:
   a. a minimum 50% permeability has been achieved by the screen landscaping. Permeability measurements will be taken at heights of 2m and 4m;
   b. weediness of screen landscaping is no more than 1%;
   c. any dead, dying or underperforming plants are replaced.
10. In the instance where the screen landscaping does not satisfy requirements the maintenance period will be extended by a timeframe agreed that is suitable to bring the screen landscaping to standard.

# SC6.7.6 Restoration areas

1. Ecological Restoration Plans and documentation is to be prepared in accordance with the Planning Scheme Policy SC6.1 Biodiversity. The designer is to have consulted with Council before commencement of project planning to ascertain whether there are any site-specific limitations such as easements, special plant species, soil stabilisation, and timing for the project.
2. Restoration specifications are to include both weed management and maintenance is carried out by the developer to acceptable standard while restoration areas establish.
3. The outcome of restoration works is to return degraded natural areas to a representative and self-sustaining condition. At all stages works are to be undertaken in a manner that conserves and retains all endemic vegetation.
4. Works to restore habitat are to be of a high quality, replicating topography and structure of the natural environment or regional ecosystems and ecological linkages and be undertaken by suitably qualified, locally experienced bush regeneration contractors. Landform, habitat and plant species of local native origin are established where available, by methods to maximise environmental outcomes and minimise ongoing maintenance requirements.
5. Self-sustaining ecosystems are created through successional planting and regeneration methods that include pioneer species to stabilise the site, whilst allowing longer term species to establish.
6. Understorey shrubs and vines native to the regional ecosystem are to be used in high density edge plantings to effectively seal rehabilitation areas (including waterway or waterbody edges) against degradation and weed infestation.

## SC6.7.6.1 Types

### SC6.7.6.1.1 Corridor restoration

1. Trees species for vegetation corridors and linkages are to be selected according to the local vegetation Regional Ecosystem vegetation communities and the primary target fauna species for which the linkage is provided. Where appropriate vegetation corridors are to connect up existing remnants and/or follow vegetated waterways. Where possible, vegetation corridors are to avoid crossing over major roads or other infrastructure barriers such as built-up areas.

### SC6.7.6.1.2 Riparian restoration

1. Riparian restoration is the restoration of healthy functioning waterways by providing shade to help prevent algal blooms and invasion of exotic species, providing bank stabilisation reducing sedimentation and damage to infrastructure and crops and by providing filtration by the reinstatement of the local riparian forest system.
2. Suitable local plant species that are specially adapted to cope with flood periods and increased water flow rates are to be used in riparian restoration plantings. Site preparation and planting of riparian restoration projects in waterways which flood annually are to be timed appropriately. Most on-ground works are to be delayed till the likelihood of flood events has passed.

### SC6.7.6.1.3 Wetland restoration

1. Fully functioning restored wetland systems assist with improving water quality reaching the drinking water treatment plant for the Greater Brisbane region by capturing excess sediment and nutrients. Water quality is also improved by reinstating appropriate aquatic and terrestrial vegetation that assist in sediment filtration and provide a suitable habitat for aquatic and terrestrial fauna.
2. It is important that both the terrestrial and aquatic vegetation components of the wetland community are thoroughly investigated in the project planning stage to determine the most appropriate species to plant and the most suitable method of plant establishment.
3. Where restoration involves a large amount of weed eradication, determine the source of the weed seed during project planning stage to ensure project success and supply a long-term management plan to address the weed issue on site.
4. Ensure that aquatic flora is planted in the most appropriate location and in the right depth of water. Emergent plants stabilise wetland banks and help with nutrient and sediment stripping from the water. Submerged plants trap suspended sediment and assist with stripping nutrients from the water. Investigate the wetland hydrology before to planting to ensure that aquatic flora is planted in the most appropriate place (e.g. floating aquatic plants such as Nymphaea do not grow well in fast flowing water).

### SC6.7.6.1.4 Roadside restoration

1. The aim of roadside restoration is to reinstate appropriate native vegetation on roadsides to create linkages following major road works where the remnant vegetation in the immediate vicinity has been fragmented. Adequate retention and reinstatement of vegetation in roadside areas and waterways adjacent to roads assists with maintaining wildlife corridors,

stability of batters, providing vegetation linkages and aids with the protection of remnant vegetation and waterways by filtering roadside pollutant run-off and noise effects.
2. The planting is to be selected so as not to create a safety risk to road users.

## SC6.7.6.2 Design

### SC6.7.6.2.1 Existing vegetation

1. Remnant natural vegetation must be protected during the planning, design and construction of the in accordance with AS 4970 Protection of trees on development sites. Weed control is required to comply with relevant State legislation and Council Local Laws.
2. Regulated vegetation as defined under the *Vegetation Management Act 1999*, koala habitat areas as defined under the *Nature Conservation Act 1992*, are protected by the planning scheme and other areas of ecological significance must be protected during the planning, design and construction of the open space or park in accordance with relevant State and Local legislation and AS 4970 Protection of trees on development sites.
3. Control of prohibited and restricted biosecurity matter weeds is required to comply with the *Biosecurity Act 2014* and other relevant State legislation and Council legislation.
4. Restoration required to achieve vegetation cover on steep and bare areas of the site as well as restoring and enhancing the ecological and habitat values of the site.
5. Other native vegetation (other than weeds) may be removed where approved by the conditions of a development permit and/or the approved Landscape Plans or Vegetation Management Plan and:
   a. where open activity areas are required;
   b. to create useable park activity spaces;
   c. where vegetation within or close to activity spaces, active recreation nodes, or pathways presents a public safety hazard, Council will approve the pruning and dead wooding of hazardous trees in accordance with AS 4373: Pruning of amenity trees. Where the visibility of the park from surrounding streets needs to be improved.
6. All vegetation clearing is to be conducted in accordance with the conditions of approval and approved documents.

***Editor's note—Clearing for firebreaks and fire management lines must be undertaken in accordance with the vegetation clearing exemptions under the Vegetation Management Act 1999 and the Planning Act 2016 (https://www.qld.gov.au/environment/land/management/vegetation/clearing-approvals) and may be subject to:***
1. ***an accepted vegetation clearing code; and***
2. ***require notification to the relevant regulating authority.***

### SC6.7.6.2.2 Riparian restoration

1. Riparian restoration works within riparian zone and/or waterway or wetland buffer areas should achieve the following:
   a. to the greatest extent possible, existing locally native vegetation is retained and protected across all zones within the riparian corridor. If vegetation removal is required, vegetation replacement (where possible) and restoration works should be undertaken elsewhere in the corridor area;
   b. all restricted weeds and environmental weeds are controlled in a planned and staged process which protects bank stability and existing locally native vegetation and habitat values;
   c. support the growth, development, germination and reproduction of native plants through sensitive weed control that considers bank stability, habitat values and water quality;
   d. locally native vegetation, including trees, shrubs and groundcovers are planted and established across the extent of the riparian corridor to achieve the desired vegetation structure and composition;
   e. in-stream habitat elements such as logs, snags, overhangs and vegetation are retained wherever possible;
   f. where infrastructure is located within, or crosses a waterway area or wetland buffer, it is designed and constructed to maintain and enhance terrestrial and aquatic fauna movement;
   g. natural hydrology (flow frequency, volumes and duration) is retained to support healthy and resilient riparian vegetation.

## SC6.7.6.3 Implementation

### SC6.7.6.3.1 Planting

1. All plantings are to be carried out at an appropriate time of year when the likelihood of rainfall is greatest and when the threat to planting success is at a minimum. This will be limiting to plantings outside of season which may leave the site exposed to erosion whilst waiting for in season. Any out of season plantings will need a watering strategy suitable to conditions. Details such as average rainfall and months with the most reliable amount of rainfall is to be identified for each individual site during the project planning.
2. Developers or contractors are to allow sufficient lead-in times when planning projects to ensure that suitable plant stock can be sourced (it takes 12-18 months to produce stock from seed given different fruiting periods) for stock integrity.
3. In some instances, natural areas will be capable of naturally regenerating without the requirement for additional planting. In

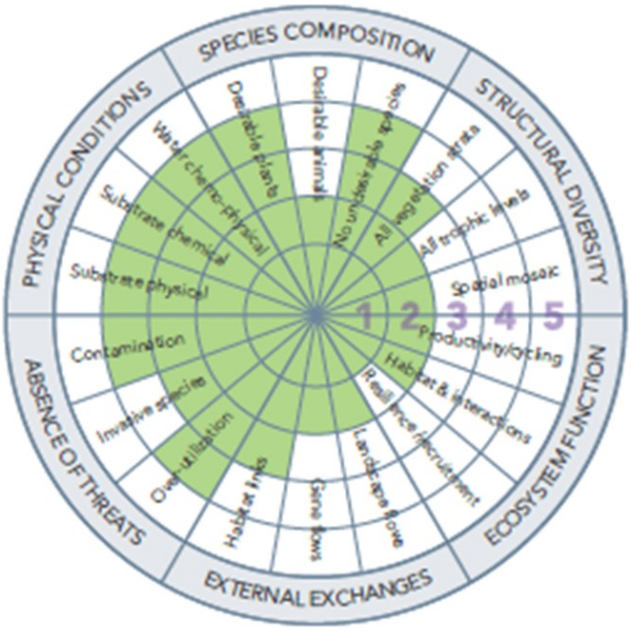
these instances, specifications to ensure the ability for natural succession to occur are to be included with a restoration plan.

4. Grassed interface between natural areas and public open space is to be cut using a side arm slasher and weed regrowth blanket sprayed with a non-residual aquatic friendly specified glyphosate preparation. Such areas are to be subject to 3 herbicide treatments to limit weed competition post planting. All dead material is to remain on site to provide a soil cover.
5. Plants are to be supplied in a minimum forestry tube or similar.
6. Species are to be local to the project area and stock is to be from seed sourced from an appropriate provenance wherever possible.
7. Plants are to be centred at a minimum 1.5m spacings to ensure acceptance for off-maintenance inspection.
8. Fertiliser is to be incorporated at planting depth (e.g. 1 x agritab).
9. Trees are to be secured by staking as required.
10. Plants are to be watered directly after planting before to the spreading of mulch. A minimum of 10L of water should be given to each tree immediately after planting. If planting coincides with natural rainfall, then the need for ongoing watering is alleviated.

### SC6.7.6.3.2 Maintenance and Monitoring Requirements

1. Ongoing monitoring and maintenance will be required to ensure the restorations continue to meet the performance outcomes and indicators. The frequency of this monitoring and maintenance will be higher during the initial 1-2 years to ensure successful establishment of the vegetation.
2. Figure SC6.1-3: Maintenance for restoration works of Planning Scheme Policy SC6.1 Biodiversity provides the expected standards of maintenance and monitoring for restoration works.
3. Maintenance activities are likely to include:
   a. Watering: While additional irrigation may be required for vegetation on exposed banks and during extended dry periods, typical watering regimes for planted vegetation are:
      i. once a week — for the first 4 weeks;
      ii. once a fortnight — for 4 to 12 weeks;
      iii. once a month — for 3 to 6 months;
   b. Weeding: Refer to sections SC6.7.3.2.2 Weed eradication and SC6.7.3.2.3 Weed control;
   c. Monitoring is undertaken during the maintenance period. For environmental offsets monitoring is ideally undertaken for 10 years after restoration. This can include samples being taken every two to three years for canopy cover, survival, species present and presence of seedlings will help to monitor success of the restoration works;
   d. Progress can also be evaluated using the 'recovery wheel' (see Figure SC6.7-7: Example of completed 'Recovery wheel'). The recovery wheel enables an assessment of how the project is achieving its ecosystem goals over time, with the aim of achieving a five-star rating for all attributes in a restored ecosystem (SERA 2021). Interactive templates for this monitoring and evaluation tool (i.e. form and recovery wheel) are available on the SERA website (https://seraustralasia.com/wheel/) or via an app store.

**Figure SC6.7-7: Example of completed 'Recovery wheel'**



Source: SERA, 2021

### SC6.7.6.3.3 Maintenance period

1. A specified maintenance period of a minimum 2 years is required for restoration planting or until the canopy closes or Council approves an alternative maintenance duration.

# SC6.7.7 Parks and open space

1. This section outlines the following for new parks and improving existing parks:
   a. design and construction standards;
   b. advice about satisfying assessment benchmarks in the planning scheme;
   c. the information that the Council may request to be supplied for a development application.
2. Where a development proposes to undertake any work within an existing or proposed park a landscaping plan is to be prepared for Council.
3. The plan is to outline all works that are to be carried out at the site such as:
   a. design statement and concept;
   b. landscaping plans consistent with the section SC6.7.2 to SC6.7.6;
   c. dark infrastructure, facilities and embellishments consistent with section 6.7.7.7 Park Type and remaining sections of this policy.
4. Parks are planned, designed and constructed in accordance with the following standards:
   a. Planning and design standards:
      i. Water by Design (2014) *Bioretention Technical Design Guidelines*;
      ii. Water by Design (2017) *Wetland Technical Design Guidelines*;
      iii. International Erosion Control Association (2008) *Best Practice Erosion and Sedimentation Control*;
      iv. Queensland Government (2021) *Crime Prevention through Environmental Design — Guidelines for Queensland*;
      v. Institute of Public Works Engineering Australia (2020) *Street Design Manual: Walkable Neighbourhoods*;
      vi. Austroads (2021) *Guide to Road Design Part 6A — Paths for Walking and Cycling*,
      vii. Queensland Government (2003) *Open Space for Recreation and Sport — Planning Principles and Implementation Notes for Local Notes*;
      viii. National Heart Foundation of Australia (2004) *Healthy by Design — A Planners' Guide to Environments for Active Living*;
      ix. Western Australia Government (2016) *Sport Dimensions for Playing Areas*;
   b. Referred Australian Standards;
   c. IPWEAQ Standard drawings, Parks suite.

## SC6.7.7.1 Design

1. Access, location and connectivity:
   a. the accessibility standards are to be in accordance with acceptable maximum distances from new developments, catchments and the expected geographical distribution rate across the region;
   b. parks are to be located in a central, prominent, highly visible and accessible location in the catchment it services;
   c. pathway connections are to be shared use, accommodate varying levels of mobility and provide an internal loop that connects activity nodes within the parklands. Lighting is to be provided on trunk pathways;
   d. adjacent land uses are to complement the park and provide a physical and visual interface such as direct residential dwelling frontage access;
   e. signage is to be provided in key locations to promote legibility of the space and enhance wayfinding within the locality;
   f. district and regional recreation parks are to be serviced by public transport and where possible should have dedicated public transport stops, as well as adequate off-road parking.
2. Physical design:
   a. parks are to have a regular and efficient shape that can accommodate the required functions;
   b. parks are consistent with the desired standards of service in the Part 4 LGIP and Schedule 3 to accommodate provision of infrastructure and embellishments. Natural or constrained areas may have undulating terrain to provide relief in the landscape (Table 4.4-7: Maximum desired grade provides the acceptable gradients for specific parks and community facilities).
3. Character, cultural and natural design elements:
   a. significant natural and cultural features are to be retained and promoted in park design when conducive to setting and function, particularly where required by legislation such as those governed by Cultural heritage provisions;
   b. public art is encouraged and provided in civic or community areas, gateway spaces or in play space as interactive play. Public art should be durable and resistant to vandalism;
   c. interpretive signage is provided when cultural and environmental features are present;
   d. WSUD elements may be included in the landscaping so that it does not interfere with the functionality of the park and or be at the expense of recreation activities;
   e. key viewpoints are retained and promoted. Views into and external to the park are important in maintaining and promoting sense of place.
4. Safety and security:
   a. CPTED principles are used to guide the design and location of infrastructure;
   b. playgrounds are to be located at least 10m from private dwellings and 20m from external roads;
   c. bollards, slip rails, vegetation and other measures are to be used to deter unauthorised vehicle access in parks.

These should be able to be removed for the purposes of Emergency vehicles egress or Council maintenance purposes;
   d. landscaping is used to delineate recreational activities, activity nodes, private and public spaces and allow surveillance;
   e. vegetation features do not block views to and from the main activity areas and play equipment.
5. User comfort:
   a. public amenities, where consistent with the park classification, are provided and located close to key locations which are easily accessible;
   b. passive recreation nodes are provided in areas which allow for sitting and nature appreciation;
   c. kiosks, restaurants, community facilities, sporting facilities and cafes may be utilised in regional and destination recreation parks to activate the space or Sport Open Space to support club activities;
   d. shade and shelter are provided to maximise user comfort including adequate cover of pathways, play spaces and formal seating areas.

## SC6.7.7.2 Park types

1. The park function and type referred to in this section relates to the components of the open space network described in Part 4 - Local Government Infrastructure Plan (LGIP) and associated Schedule 3, within the Planning Scheme.

### SC6.7.7.2.1 Recreational Parks

1. Established for a range of structured and unstructured activities, community recreation, cultural activities or wellbeing uses. Includes landscaped parklands, playgrounds, passive spaces and community gardens.
2. Regional parks have very high levels of visitation. Some parks may experience very high levels of visitation for short periods of time such as for an event or over a holiday season while others tend to have a more consistent level of visitation over the year, though there may well be variations during the week. Regional parks are provided where the opportunity arises—they may not be distributed equitably across the region. They have unique values that differentiate them from other types of recreation park. They are usually associated with attractive natural landscapes or historic, or unique man-made features that make them very popular with residents and visitors. They may also be developed to preserve Indigenous heritage. The level of embellishment needs to be able to support the high loads so there is often a higher level of hard surfacing, signage, barrier controls and similar. Regional parks generally require significant car parking and be capable of supporting public transport access.
3. District parks offer a variety of activities sufficient to keep visitors entertained for several hours. Typically these parks will offer higher order play experiences for toddlers through to teenagers and may include picnic facilities, barbecues, shelters, and public amenities to allow for extended family and group visits. District Parks may accommodate events such as car rallies, markets, musical events and film nights.
4. Local parks are the most common park type. Local parks are usually accessed by walking or cycling and appeal to the people living within that walk or cycle catchment. The park area is smaller than Regional and District parks. Local parks are often located within a residential setting. Embellishment will be focussed on a theme such as youth play, natural area play, community gardening, exotic trees or quiet contemplation to add variety across the park type. Some parks may have relatively little embellishment while others are highly embellished.
5. Civic and memorial: Civic and memorial spaces are used for organised community events, rallies, performances and similar that attracts a significant crowd. As the use is often very intense there are often higher levels of hard surfacing. Some civic and memorial parks have a high recreation function.
6. Linear parks and linkages include areas of connected or continuous green space that are elongated in shape and form links between key destinations within the open and civic space network. These parks may have multiple purposes which may include contributing to the conservation of habitat and scenic areas, facilitate walking and cycling corridors, serving floodway and drainage functions, and protecting water quality.

### SC6.7.7.2.2 Sport Parks

1. Sport Parks primarily cater for a variety of formal sporting activities through the provision of a range of training and competition infrastructure. These parks include facilities for undertaking competitive, organised activities, ancillary infrastructure to support sporting activities, and/or free, unrestricted access to the public at times when formal sport is not being undertaken. Sport parks are to be multi-use and promote the shared use of facilities between a number of clubs and sporting codes. Typical infrastructure includes irrigated sports surfaces, hard courts, indoor sports centres, lighting, clubhouses, public toilets, change rooms, storage rooms or areas, shade, spectator seating, drink fountains, litter bins, internal road network and parking facilities and signage. Sports parks are broken into two categories District and Regional.
2. Other sport parks are either specialised in nature (requiring specific infrastructure to make them usable) or are private sports facilities that may not be publicly accessible. Other sport parks are broken into three categories: Specialised, Indoor and aquatic, Private.

## SC6.7.7.3 Open space management statement

1. An open space management statement ('the statement') is required where land is to be provided as conservation reserve, open space or for sport and recreation purposes. The statement outlines management for proposed open space areas during construction and maintenance phases of the development. The statement should include:
   a. proposed area to be dedicated as open space, including contours and other topographical information;
   b. remnant vegetation and fauna including essential habitats and wildlife corridors;
   c. water quality management, including any swales, detention basins, dams, or lakes;
   d. erosion and sediment control management;
   e. bushfire hazard management;
   f. proposed level and length of maintenance periods;
   g. other issues, such as access and linkages have been identified during the design stage or in the site analysis.
2. For construction phase of development, the statement should include:
   a. delineation of proposed public open space areas;
   b. protection measures for vegetation to be retained or relocated;
   c. location and details of all proposed on-site sediment and erosion control methods;
   d. methods and details of disposal of vegetation approved for removal;
   e. details for protection or translocation of any fauna on site (where appropriate);
   f. temporary fire hazard mitigation measures e.g. fire trails, water storage facilities (only where appropriate — information can be drawn from any Bushfire Management Plan undertaken for the whole site);
   g. details of methods for maintaining appropriate water quality (if appropriate);
   h. location and details of storage of materials and storage compound for machinery on site;
   i. location and details of temporary access for vehicles and site construction personnel;
   j. access or protection to any infrastructure services by others;
   k. location and details of any enclosures including boundary fences;
   l. methods of control of a restricted matter (i.e. environmental pests and weeds);
   m. maintenance periods;
   n. other issues as previously identified in the site analysis and design process.
3. The statement should also include how the quality of the spaces will be maintained during on and off maintenance, including:
   a. standard and quality of grassed areas;
   b. cleaning of any silt deposits;
   c. standard of any planting areas including retained vegetation areas, rehabilitation areas and garden areas;
   d. condition of any permanent infrastructure such as irrigation, onsite sediment and erosion control devices, hard surfacing, detention basins;
   e. condition of any park facilities or play equipment;
   f. rubbish and site debris removal;
   g. standard to be achieved about restricted matters (i.e. environmental pests and weeds);
   h. standard of fire hazard mitigation measures (fire trails and water storage facilities).
4. The statement should also include how ongoing management or maintenance for Open Space Areas should be undertaken, including:
   a. identification of the purpose of the open space area including objectives for future use;
   b. details of each proposed open space area;
   c. maintenance for the landscaping, conservation area and protection of any significant sites;
   d. future management and maintenance regimes for protection of significant vegetation areas, ecological systems, waterways, and fauna;
   e. management of bushfire hazard (if appropriate);
   f. tree management procedures;
   g. future management and maintenance regimes for sediment and erosion control devices, and irrigation;
   h. future need and management of infrastructure including sport, recreation, and public facilities;
   i. maintenance of built form and hard surfacing;
   j. management and control of a restricted matter (i.e. environmental pests and weeds);
   k. management of rubbish;
   l. indicative costs.

## SC6.7.7.4 Crime prevention through environmental design

1. Park designs are to incorporate the principles of crime prevention through environmental design, in particular:
   a. dense stands of vegetation should be confined to park peripheries;
   b. dense vegetation is not located alongside paths and play equipment;
   c. vegetation does not block casual surveillance of picnic and play areas from adjacent or nearby residences;
   d. landscaping does not restrict sightlines and opportunities for natural surveillance within and of a site;
   e. all new plants around centres of activity should be single clean trunked trees to minimum of 1.8m or more in height with shrubs being 500mm or less in height;
   f. lighting is required:

   i. along pedestrian and cycleways;
   ii. with park facilities such as toilets and picnic shelters;
   iii. safety in large parks or areas of vegetation within a development may be enhanced by planting trees in thin strips which maximises the number of trees planted but which also restricts the ability of offenders to hide within a mass of vegetation.
2. Landscaping is used to:
   a. discourage graffiti on walls (e.g. retaining walls and acoustic barrier fences);
   b. break up large areas of hard landscaping, (e.g. car parks);
   c. add visual interest and structure to extensive open areas;
   d. create new spaces, nodes or buffers within the open space;
   e. provide screening along site boundaries;
   f. enhance areas of retained vegetation.
3. Plants are selected to match the intended level of park maintenance and to reinforce the design with strong planting structure. Maintain visibility and the opportunity for surveillance along paths, and near facilities such as toilets, playgrounds and recreation nodes. Incorporate CPTED principles in the park landscape planning.
4. Gardens and hedges requiring regular maintenance must only be provided in high profile locations such as landmark or signature points, and parks with cultural heritage components or formal design themes (e.g. monuments, urban common parks).
5. Temporary ornate landscaping used as part of sales and marketing strategy, will not be approved within open spaces or parks.

## SC6.7.7.5 Embellishments for all parks

1. All infrastructure construction works, including use of hard and soft landscape materials and quality of workmanship, comply with applicable Australian Standards and the Building Code of Australia.
2. Infrastructure materials are:
   a. resistant to vandalism (i.e. robust, with replicable components and tamper-proof fittings);
   b. easy to clean;
   c. reflect a strong visual aesthetic;
   d. discouraging of graffiti (e.g. using resistant materials, textured surfaces, dark colours and patterns, and associated screening vegetation where appropriate).
3. Park furniture should reflect the intended function of the park and compliment any distinguishing features present e.g. seating situated to maximise a view scape. Some preferred features of furniture include:
   a. park benches located under a natural or built shade structure to allow day long use. If the shade is built, it should have an impervious roof e.g. Colorbond to provide shelter during rain;
   b. well drained ground and hard surfacing below any structure. Surface material could be pavers, coloured or exposed aggregate concrete etc.;
   c. shade structures should maximise protection from the sun during the hours of 10am to 3pm;
4. Council is to be contacted to provide the specifications for the preferred refuse bins and whether refuse bins are required.
5. All park embellishments are required to be approved by Council before installation.
6. While contextual design is to be responsive to the qualities that are unique to that landscape, some specific design considerations will be common to all projects. These include:
   a. Distinctiveness: materials and elements reflect the desired image or theme of an area or the LVRC standard palette. Distinct materials assist people to ‘read’ and navigate by reinforcing urban structures, common patterns, rhythms and themes of the site;
   b. Long term availability: ensuring the materials will be readily available over the long term;
   c. Equivalence: determining design criteria for acceptable substitutions if the preferred item is not available;
   d. Durability: assessing the durability of an item or material and how this bears on life cycle costs. It is to be made from materials that will last and can be suitably protected from exterior elements, such as UV exposure. Furniture items are to come with a minimum 5 year warranty on materials and workmanship;
   e. Maintenance: Infrastructure items are designed, constructed and located to minimise vandalism (including graffiti) and in areas that are easy to maintain. Concrete base aprons are to be included to separate from contaminants and provide egress for maintenance;
   f. Safety and Public Liability: assessing fall heights, soft fall, trip hazards etc. Infrastructure items, such as shelters, are to have building approval and be certified by a RPEQ Certified Structural Engineer;
   g. Considerate of the environment: Infrastructure items are not located within the critical root zone of tree preservation area of habitat trees.
7. Where possible, natural features may be used, e.g. mounding for seating, trees or natural rock for bollards to simulate park furniture.
8. Open and civic space furniture (including seats, bins, tables, drink fountains, bike racks etc.) is to be selected or designed and located in accordance with:
   a. AS 1428.1 Design for access and mobility — General requirements for access — New building work;
   b. AS 1428.2 Design for access and mobility — Enhanced and additional requirements — Buildings and facilities;
   c. Austroads Guide to Road Design Part 6A: Paths for Walking and Cycling.

## SC6.7.7.6 Park preparation works

1. Consideration should be given to relevant sections under SC6.7.3 All landscaping works including but not limited:
   a. Site stability;
   b. Site drainage;
   c. Existing vegetation;
   d. Soils and growing media.

### SC6.7.7.6.1 Site clearing

1. All rubbish and debris, including builder rubble, redundant services, footings, fences and declared weeds, are removed from the site.
2. Disused items such as wells or septic tanks are removed or filled.

### SC6.7.7.6.2 Earthworks

1. Earthworks are undertaken to create functional spaces, stabilise the landform of the site, improve drainage and make the space safe and accessible for public use.
2. Batters, mounds, artificial embankments or retaining walls for activity and recreation spaces do not encroach into park activity spaces.

*Note—Batters and earth-retaining structures must conform to the requirements set out in Schedule 1 of the Building Regulation 2021.*

### SC6.7.7.6.3 Grass

1. All parks are to be covered with topsoil to a depth of not less than 40mm and be lightly compacted and grassed in accordance with Council's minimum standards and specifications.
2. To guarantee a high standard of maintenance all parks are to be in a mowable condition, free from rocks and loose stones, and graded to even-running contours.
3. Grass should be established within the proposed park as quickly as possible in order to avoid erosion and sedimentation to the local waterways and prevent the establishment of weeds in accordance with section SC6.7.3 All landscaping works.
4. Grassing of ovals and sporting fields shall be based on Council's approved site-specific standards and specifications covering site preparation, drainage, topsoiling, fertiliser.

### SC6.7.7.6.4 Mounding

1. Mounding may be used within the park design to provide topographical interest, to emphasise views, to help screen adjacent properties or eyesores, or as part of the internal design. The mounds should not exceed a gradient of 16% (1H in 6V) to reduce erosion and allow mowing. Planting of trees and shrubs over the mound will further emphasise height and shape.
2. Care should be given to ensuring that the mound does not restrict visibility into and out of the park thus threatening the safety of users or provide unwanted visibility into private properties.
3. Landscape mounding is to be in accordance with standard drawings unless otherwise approved.

## SC6.7.7.7 Park landscaping

### SC6.7.7.7.1 Edging

1. Edging must be installed in accordance with the relevant standards at the interface of grassed and mulched landscape areas (excluding individual trees and remnant natural vegetation). A concrete edge must be constructed around gardens and landscape beds where there is no adjacent wall, pathway and/or pavement area. The concrete edge kerbing must be constructed in accordance with IPWEAQ Standard drawing, RSD-200 Kerb & Channel - Profiles and Dimensions - Including Edge Restraints, Median & Channel, Type ER2.
2. A timber edge is only acceptable around habitat rehabilitation areas, and landscaping that includes a prominent tree canopy (urban forests), but not garden beds.
3. Mulched areas that adjoin grassed areas must be shaped to allow easy mowing by tractor-drawn mowing equipment. The edging must be straight, or with long sweeping curves. Corners must be between 45º and 90º. Acute corners and repetitive short radius (snake-like) bends must be avoided. A sloping border or border edge 175mm x 90mm.
4. Playground concrete edging must be minimum of 175mm x 250mm.

### SC6.7.7.7.2 Garden beds

1. The maximum grade for a garden bed is 1 in 3.
2. The finished grade of the edge to the garden bed is flush with all abutting hard finished and grass surfaces.
3. The minimum depth of soil for a garden bed is 300mm.
4. the finished surface level of a garden bed adjacent to a building or other structure is 125mm below the weepholes in the building or the structure.

### SC6.7.7.7.3 Tree planting

1. Parks provide a range of recreation opportunities and there is scope to utilise planting design to help achieve this objective, options include:
   a. shade trees evenly planted throughout the site to maximise protection from the sun;
   b. island or corridor planting to concentrate trees for easy maintenance and encourage bird life for pleasure viewing;
   c. grouped planting will also provide shade adjacent to open space to allow unencumbered active play areas;
   d. lines of tree planting to define edges of informal kick-about areas.
2. Root barriers are to be installed for large shade trees that have the potential to disrupt services, play equipment embellishments and lawn (refer to standard drawings).
3. A minimum 75% of the proposed tree planting should be endemic, and species should be selected on their adaptability to site conditions, and their value to local fauna. Where the proposed park adjoins an area of established native vegetation, an extension of this habitat into the park should be implemented by using compatible species. The designer should also be encouraged to use rare and endangered plant species, or species proven to have excellent bird, butterfly and insect attracting qualities.
4. To promote the unique landscape characteristics of the region exotic flowering trees and non-native palms should only be used as features or emphasis, where necessary.
5. Trees for parks must be selected to provide visual interest through seasonal colour or form. Where possible, select tree species that cannot be used in street or private garden planting, because of size, spreading habit or root invasion potential.
6. Existing mature trees must be integrated into the park design and planting plan.
7. For amenity planting, groups or avenues of trees of a single species or a combination of two or three species must be used, rather than scattered planting of multiple species. Where a park has a landscape, character derived from existing vegetation, similar tree species must be planted to add to the character.
8. Canopy trees must be planted to provide future shade in car parks and near playgrounds, seats, and active recreation nodes such as basketball and netball facilities. As a minimum, shade trees must be incorporated every sixth car park bay.

### SC6.7.7.7.4 Species selection

1. Tree species selection is critical in achieving a quality outcome for the planting scheme in a park. Attention must be paid to the following criteria when selecting tree species for a site:
   a. soil type and structure;
   b. aspect;
   c. local and preferred park character;
   d. natural or cultural heritage values on or next to the site;
   e. maintenance regime;
   f. safety — avoid trees that shed limbs.
2. Preferred species are listed within the Appendices 1 to 5 which are suitable for use within the Lockyer Valley Region.
3. There are several attributes that must be evaluated when selecting trees for open spaces and parks. The following have the potential to pose risks or cause damage to property if trees are planted in the wrong location:
   a. toxicity;
   b. fruits and seeds;
   c. thorns;
   d. limb shedding;
   e. invasive roots.
4. Undesirable plant species are listed in Appendix 6.
5. Specimen trees planted within mown areas and car parks, and near paths and recreation facilities, must be of single trunk form and with lower branches that can be trimmed as the tree grows. This is to:
   a. facilitate access by mowing equipment;
   b. accommodate vehicle and pedestrian sight lines;
   c. maintain opportunities for passive surveillance.
6. The selection of trees must also reflect the purpose or function required to provide shade with the required maintenance character, select species that provides a shade canopy without creating potential hazards such as excessive limb falls. Adequate space must be provided around trees to avoid damage by tree roots to pavements and facilities.
7. Hydraulic constraints must be considered in the selection of suitable species and spacing of trees in areas subject to

flooding, such as land near waterways. Trees of single trunk form are preferred in these areas.

### SC6.7.7.7.5 Irrigation

1. All irrigation systems (temporary and permanent) connected to reticulated water supply is to be metered and installed in accordance with Urban Utilities' specifications. The installation of water meters, backflow prevention devices and isolation valves are mandatory in all irrigation systems and are to be installed by a licensed plumber (refer to AS/NZS.3500 Plumbing and drainage, Part 1.2 Water Supply — Acceptable Solutions).
2. An irrigation plan prepared by an irrigation consultant, is to be submitted to Council for approval together with the landscaping plans.
3. The design of watering systems is to ensure an efficient and economical application of water. Such systems are to be designed to use low water application and run only during Urban Utilities' nominated times. During periods of water restrictions, the developer may need to obtain an exemption permit to irrigate outside the restricted hours.
4. The irrigation system is to use the following components and be installed in accordance with Urban Utilities' specifications.
   a. a backflow prevention unit, installed to the requirements of AS/NZS.3500 Plumbing and drainage (set);
   b. 20mm, 25mm, 32mm or 40mm diameter PVC pipework (as required) to garden bed areas, laid in a ring around the periphery of each garden bed;
   c. pop-up sprinklers to periphery of garden beds. Fixed shrub heads to centre of islands only;
   d. automatically operated controller in PVC box laid flush with finished ground level.
5. All irrigation pipework installed under roadways is to be laid in minimum 100mm diameter uPVC Class 9 conduit.
6. The water connection and installation of the irrigation system is to be carried out by an approved contractor at the developer's cost. The maintenance period for irrigation works is to be until acceptance off maintenance. Thereafter all maintenance and watering will be the responsibility of the Council.
7. The installation of an irrigation system on Council property, other than buffer mounds, traffic islands and roundabouts, e.g. verges, will not be permitted unless:
   a. the system is separate from the development and all pipework is located adjacent to the kerb and channel; or
   b. the verge is irrigated from sprinklers that fall within the development property boundaries.
8. Water lines are not to cross other underground services located within the verge.
9. If a separate irrigation system within the verge is desired, the developer will be required to pay all installation costs, which include:
   a. tapping into main;
   b. installation of 25mm diameter (typical) backflow prevention device;
   c. installation of pipework and pop-up sprinklers;
   d. installation of solenoid valves and automatic controller.
10. Where required, temporary irrigation is to provide establishment watering up to a point where the landscape can survive wholly dependent on rainfall. The property owner is to decommission all temporary irrigation before acceptance off maintenance. All temporary irrigation is to comply with water conservation requirements (water restrictions, demand management and water security strategies, etc) and designed in such a way to ensure public safety and limit risk of vandalism (i.e. under surface installation where possible in public areas).
11. Application is to be made to Urban Utilities for connection of irrigation systems to the water main for all landscaping of Council assets. All works are to be carried out at the developer's cost.
12. The developer is responsible for the payment of all water used during construction, testing, establishment and maintenance of the irrigation system and landscape works until acceptance of off maintenance.

### SC6.7.7.7.6 Excavation

1. Do not excavate by machine within 500mm of existing underground services.
2. The standard width of trench for pipes is 150mm.
3. Unless noted otherwise on the approved drawings or directed by Council, all pipe work is to be installed with a minimum cover of 350mm.

### SC6.7.7.7.7 Laying of pipes

1. All pipe work is to be bedded in clean fill sand with a minimum cover of 50mm all round.
2. Special precautions are to be taken to exclude dirt, sand, grit and gravel from entering pipelines.
3. The open ends of pipes are to be plugged at the end of the day's work to prevent entry of water or mud.

### SC6.7.7.7.8 Controllers

1. Irrigation systems for Council landscaped areas are to be controlled by electrically operated solid state controller.
2. The automatic control is to be capable of operating as a stand-alone controller with integral 240 VAC power source, multi start times, multi-independent programs, 'Cycle and Soak' capability, and have provision for sensor input or override. Installation is to be strictly to manufacturer's instructions, and in a location as directed by Council. Internal automatic

control will provide unattended operation of the irrigation system.
3. Internal installation is to include connection to the 240V AC outlet. All wiring is to be via PVC conduit sweep bends. The 24 AC control wire is to be connected from the controller to the 24 AC solenoid valves, with access from external points to be via conduit through sleeves and/or penetrations.

### SC6.7.7.7.9 Filtration

1. All irrigation systems are to be fitted with an approved flow strainer installed in a secure enclosure.

### SC6.7.7.7.10 Valves

1. Electrically actuated solenoid valves are to have flow control, manual bleed screw, 24 VAC solenoid, Buna N diaphragm, and be constructed of PVC and stainless steel. They are to be suitable for direct burial and have 150 psi maximum working pressure. They are to be pressure regulating solenoid valves.
2. Isolation valves are to be of bronze construction and of the BSP screwed gate type. They are to be installed on the supply side at every solenoid valve to enable isolating.
3. Protective valve boxes are to be provided for each solenoid valve. They are to be constructed of green high-density polyethylene, be 450 x 300 x 300mm in dimension, and have a lockable lid with the word ‘Irrigation’ clearly marked on it.
4. The wiring from the solenoid to the controller is to be laid in conduit and be of 250V grade and be installed to approved standards. The wiring is to be located with all pipework.
5. All solenoid valves are to be connected to a controller by 1.5mm2 solid core wire or decoder wire and to have 7 insulated cores within a common plastic protective shield. It is to be similar in all respects to RIS multi-core electrical control wire and be continuous between valve and controller, and valve to valve. An added 1m length of cable is to be provided at each wire termination. Cable is to be sized for voltage drop not exceeding 4 volts over total route length.
6. Solenoid valves are required to be fitted with a ball valve upstream of each valve, as approved by Council.
7. Where required installation of the air valve is to be off the top of pipe positioned with a 30-degree angle off from the horizontal.

### SC6.7.7.7.11 Backflow prevention devices

1. All Council landscaped areas, which require irrigation systems, are to have a backflow prevention device installed. This device should comprise of a stand constructed fully from hard drawn copper pipe (Type D) and should have an inline strainer both before and after the backflow preventer. This should comply with AS/NZS 2845.1 Water supply - Backflow prevention devices, Part 1: Materials, design and performance requirements.

### SC6.7.7.7.12 Performance test

1. On completion of the installation the system is to be tested in the presence of an authorised Council officer.
2. The system is to be operated to demonstrate that all components function as required by the design.
3. The developer is responsible for making all necessary alterations to the system so that the performance is in accordance with the design specifications.

### SC6.7.7.7.13 Backfilling of trenches

1. Trenches are to be backfilled with the excavated material. If the excavated material is considered unsuitable for backfilling by Council, it is to be removed from the site and replaced with clean approved backfill material.
2. All trenches so backfilled is to be compacted and lightly raked to ensure that surface levels correspond and match adjacent surface levels, are free draining and free from mounds or depressions. All rocks or evidence or excavated subgrade is to be raked up and removed.

### SC6.7.7.7.14 Maintenance

1. Landscaping is to be designed with simple maintenance requirements to achieve a better long-term result. Species are to be matched to the growing conditions of the specific planting site to reduce future maintenance requirements.
2. Landscape maintenance is an integral component of landscape development and sustainable long-term maintenance outcomes are to be integrated into the landscape design. This applies to both the vegetative landscape and built structures. It is important to consider Council’s maintenance capacity and programs when designing areas to be handed over to Council.
3. Before a landscape asset is handed over to Council, a sustainable maintenance regime (programmed and budgeted) is to be developed and implemented. The landscape is to be complete and as described within the approved development plans, free of damage and vandalism, established, self-sustaining and in a state that requires an acceptable level of ongoing maintenance to maintain a high-quality landscape.

4. Desirable characteristics of a low maintenance landscape design are:
   a. plant species that will retain their health, vigour and form without regular pruning;
   b. plant species that are resistant to pest, disease and fungal attack;
   c. plant species that will suit the specific conditions of the subject planting site;
   d. plant species that require minimal formative pruning or hedging;
   e. the use of canopy species that will form a long-term vegetation framework;
   f. the careful preparation of garden beds, to ensure good soil health for plant growth;
   g. mass planting of garden beds with only two or three species that ensures a simpler watering program, with plants achieving a similar growth rate and an even cover of greenery;
   h. the use of weed free mulch planting areas to retain water and suppress environmental weeds and invasive plants;
   i. the provision of sufficient space and room to manoeuvre ride on mowers, with the use of smooth flowing lines to allow machinery to manoeuvre around assets;
   j. the use of appropriate garden edging to minimise the need for spraying or edging and for ease of mowing;
   k. robust furniture, that withstands heavy use and vandalism.
   l. easily replaceable furniture items and elements;
   m. use of appropriate sealants and anti-graffiti coatings to enable easy washing;
   n. accessibility and safe access for maintenance, especially along roadways;
   o. appropriate selection of plants with consideration of the appropriate size, form and density for the space, ensuring the plants are able to grow and mature without becoming overcrowded;
   p. planting that quickly creates a full canopy cover and/or groundcover to ensure effective establishment and reduce maintenance; and
   q. endemic native vegetation species should be used where appropriate, and where adjacent or connecting to natural bushland.
5. Council officers will inspect the works as required and as requested by the developer for the purpose of on maintenance and off maintenance milestones.

## SC6.7.7.8 Park access

### SC6.7.7.8.1 Vehicle access

1. One or more controlled maintenance (service) vehicle access points shall be provided at strategic locations along the road frontages or internal roads and car parks of a park.
2. An entrance barrier, such as removable bollards, lock rail or gate in accordance with section SC6.7.7.10 Fencing, bollards and lock rails, is installed at each user or maintenance vehicle driveway into the park.
3. External access is to consist of a 3.5 m wide reinforced concrete driveway (refer to IPWEAQ Standard drawing, RSD-102 Vehicle Crossing - Heavy Duty Vehicle Crossing) provided between the road and the park boundary, formed for occasional access by an industrial refuse collection vehicle, a medium rigid vehicle with trailer, and emergency vehicle.
4. Alternative all-weather access materials may be used in certain situations, for example in a bushland setting.
5. If the maintenance access point is located on a major road or any road with a speed environment of over 50km/h:
   a. a setback or queuing area is provided between the road and the entrance barrier that is sufficient to allow an industrial refuse collection vehicle or a medium rigid vehicle with trailer to park next to the barrier without obstructing traffic flow; or
   b. the access facility is located on a minor road with a speed limit of 50km/h or less.
6. The layout of the park allows maintenance and emergency vehicles to access all park facilities, activity nodes and service infrastructure.

### SC6.7.7.8.2 Internal roads

1. Roads may be required in a District or Regional park to provide vehicular access to park activity nodes.
2. Road and parking design and layout:
   a. do not impact on the park's useable space or its landscape values;
   b. are kept to the edges of parks to minimise the impacts on park users and open-space character.
3. Internal roads that extend into the park to specific facilities or to create a sense of arrival may be approved, provided they do not compromise park values.
4. Subject to the anticipated level of use by large vehicles such as tourist buses, a reduced pavement width and a reduction in design speed is preferred in parkland, by eliminating the allowance for parking lanes where appropriate and using speed control treatments.
5. Unless specified otherwise by Council, a 5.5m-wide pavement designed and constructed to the standard of a neighbourhood road (minimum traffic loading of 1.5 x 105 ESA) is provided.
6. Internal park roads have a concrete edge or kerb consistent with the IPWEA Standard drawing, RSD-200 Kerb & Channel - Profiles and Dimensions - Including Edge Restraints, Median & Channel, Mountable kerb type ER2.
7. Kerb and channel is only required where run-off from the road pavement could erode the road shoulders or could compromise maintenance operations or values and use of the adjacent parkland.

8. Vehicle barriers are provided beside the road to prevent vehicles driving across the park consistent with section SC6.7.7.10 Fencing, bollards and lock rails.

### SC6.7.7.8.3 Internal circulation

1. The park layout should be designed to ensure that internal circulation or movement within the park is:
   a. safe;
   b. unencumbered;
   c. highly visible internally and externally;
   d. linked to external cycle and pedestrian networks.
2. Design features including access points, street frontages, carparks, pedestrian paths, bike paths, park equipment and lighting should be considered.
3. Design of paths, carparking and access points should consider the needs of people with mobility challenges. Pathways are to be in accordance with Planning Scheme Policy 6 Infrastructure design, section SC6.6.5 Streets and roads and comply with accessibility standards.

### SC6.7.7.8.4 Car parking

1. Parking bays for people with disabilities are provided at a ratio of 1 disablity space for every 20 car parking spaces and comply with AS 1428 Design for access and mobility (set).
2. Concrete kerbing or edging to car parks is consistent with section SC6.7.7.8.2 Internal roads.
3. Wheel stops are specified where there is no kerb and channel adjacent to car park bays or a mountable kerb is provided.
4. Wheel stops are to be located a maximum of 600mm from the front edge of the mountable kerb.
5. Precast concreate wheel stops are to be 150mm x 75mm x 2m long.
6. The fall of the car parking surface is to fall towards the kerb and grassed areas.
7. Water sensitive urban design features are incorporated in compliance with section SC6.7.7.7 Park landscaping.

### SC6.7.7.8.5 Primary public access point

1. At least one public pedestrian access point is provided along each road frontage of a park and is designed and located so that the access point:
   a. is separate from vehicular access points;
   b. is a minimum of 6m from an adjacent residential boundary;
   c. complies with AS 1428 Design for access and mobility (set);
   d. meets desired lines of travel into the park from adjacent facilities (including pedestrian road crossing points, active transport paths, transport nodes and community facilities);
   e. is clear of areas of ponding, inundation or overland flow;
   f. provides for visibility and safety, using crime prevention through environmental design principles.

### SC6.7.7.8.6 Pathways and paved areas

1. Internal access for maintenance and emergency vehicles shall be planned and located in accordance with the following principles:
   a. provide for vehicular access to park facilities and areas requiring regular cleaning and ongoing maintenance (toilets, playgrounds, rubbish bins, barbeques, mown areas etc). Wherever possible, a 3.5m wide all-weather access shall be provided to these facilities and areas. The access would normally follow grassed areas and internal tracks, but a formed track (preferably with a permeable surface) may be required through wet areas.
   b. provide maintenance access to service other infrastructure, such as utilities, manholes and stormwater quality improvement devices.
   c. where possible separate maintenance access from recreational pathways, such as bikeways Highly visible internally and externally
   d. linked to external cycle and pedestrian networks.
   e. ensure bridges and culverts are designed for maintenance vehicles.
   f. emergency vehicle access shall be provided to high use activity spaces in a park.
   g. pathways to comply with AS 1428.1 Design for access and mobility.
2. A continuous path of travel is provided from a toilet facility to source of demand consistent with AS 1428 Design for access and mobility - General requirements for access - New building work.
3. External lighting, for public toilets open at night-time, is provided to:
   a. the main path of travel to the public toilet, usually a pathway to the public toilet from a primary access point to a park, a carpark or aroad;
   b. the area surrounding the public toilet

### SC6.7.7.8.7 Active transport network (pedestrian and cycle paths)

1. Concrete pathways should be provided to amenities from the public area, car park area or nearest road. Pathways to comply with AS 1428 Design for access and mobility Part 1: General requirements for access—New building work.
2. All hard surfacing areas are to comply with:
   a. general pedestrian pathways and circulation zones connecting all key park or space amenities and embellishments such as carparking, amenities buildings, seated viewing points, formal playground spaces, BBQ or picnic settings:
      i. AS 1428 Design for access and mobility (suite) where park terrain, permits;
      ii. AS 4586 Slip Resistance classification of new pedestrian surface materials;
   b. shared or dedicated cycle paths:
      i. Austroads Guide to Road Design Part 6A — Paths for Walking and Cycling;
      ii. IPWEA Standard drawings, Active transport suite.
3. All hard surfaces are to have falls that prevent ponding and areas external to building envelopes are to be designed to provide appropriate stormwater management away from built structures to a suitable collection point.
4. The selection and design of new hard surfacing shall also consider the following:
   a. hard surfacing capable of supporting the volume and weight of expected traffic;
   b. durability, such as the rate of wear and tear and susceptibility to discolouration;
   c. maintenance costs and long-term maintenance requirements;
   d. resistance to heaving by tree roots, requiring additional reinforcing, deformable cushioning, retaining walls, bridge beaming or flexible paving surfaces such as rubber epoxy compounds;
   e. porous pavements to be mandatory when hard surfacing is required around existing trees to be retained. In high intensity urban areas, where trees are installed in hard surface areas, the use of porous pavement over gap-graded sub-grades is mandatory;
   f. for pedestrians, wheelchair users and people with mobility constraints, a surface that is comfortable and functional;
   g. paved areas for units restrained by a hard edge, preferably concrete and laid on a structural concrete subbase;
   h. where pavements are required adjacent to existing trees include tree protection measures reduce potential impacts (refer to AS 4970 Protection of trees on development sites).

### SC6.7.7.8.8 Bikeways

1. Bicycle paths are provided in parks where a shared path is provided.
2. Where there is no specific requirement identified by Council, any proposal to construct a bicycle path, separated path or shared path in a park is carefully assessed to determine whether a pedestrian path or local access path could provide a satisfactory alternative, particularly where a wide pavement could compromise other park values (such as biodiversity, landscape amenity and park visitor safety).
3. Bicycle paths, shared paths and separated paths in parks incorporate threshold treatments, signage and textured surface materials where appropriate, to warn cyclists and pedestrians of intersections and other hazards consistent with Planning Scheme Policy 6 Infrastructure design.
4. Shared paths in parks provide for disability access, as specified in AS 1428 Design for access and mobility (set).
5. Bikeway construction is to be in accordance with IPWEAQ Standard drawings:
   a. PCD-301 Bikeways - Standard Entrance Control;
   b. PCD-302 Bikeways - Featured Entrance Control;
   c. PCD-303 Bikeways - Slowdown Control - Reverse Curve;
   d. PCD-304 Bikeways - Entrance Control - Offset Chicane;
   e. PCD-401 Bikeways - Rest Rail Detail.

### SC6.7.7.8.9 Bicycle parking

1. Bicycle parking is located adjacent to the bikeway network and relative to key attractors or facilities.
2. Bicycle parking facilities in parks are designed, located and constructed to comply with Austroads Guide to Traffic Engineering Practice Part 14 — Bicycles and AS 2890.3 Parking facilities - Bicycle parking facilities.
3. Bicycle racks are pavement mounted rail in compliance with AS 2890.3 Parking facilities - Bicycle parking facilities.
4. The number of bicycle racks or parking in parks is:
   a. Regional park — greater than 12 bicycle spaces;
   b. District park — minimum 12 bicycle spaces;
   c. Local park — not required.

### SC6.7.7.8.10 Boardwalks and pedestrian bridges

1. Boardwalks and bridges may be provided in a park to provide pedestrian and cyclist access to park activity areas and other key park features and non-motorised commuter access through a park.
2. All boardwalks and pedestrian bridges, including quality of workmanship, comply with AS 2156 Walking tracks, Part 1 Classification and signage for rating 3 or 4 tracks.

## SC6.7.7.9 Fencing and barriers

1. Fencing and barriers shall be provided along road frontages of a park, to prevent illegal vehicle access and provide protection from potential hazards.
2. Safety fencing may also be required in association with infrastructure such as some playgrounds. The type of fence or barrier to be provided in a park shall be consistent with the park type, its significance and any potential hazard the fence or barrier is restricting access to.
3. All fences and barriers shall be square and true to line. Fence rails and the tops of bollards are to follow the slope of the land, without dips and bumps. Bollards are preferred at tight corners along the road frontage boundaries.
4. Hydraulic constraints shall be considered in the design and placement of a fence below the flood regulation line or across an overland flow path.
5. The following requirements will apply to fencing:
   a. the fencing shall not hinder general maintenance, otherwise the fencing shall incorporate vehicular access gates, or the fencing panels are designed for easy removal. Pedestrian gates shall be provided along road frontages;
   b. a concrete (extruded or cast in situ) mowing strip must be provided under all fences (including acoustic barriers) which interface with lawn and landscaped areas. A minimum 140mm wide x 100mm deep strip, flush with the surrounding ground, will need to be installed under timber fences or walls or galvanised steel fences. Mowing strips are not required under masonry or concrete fences or walls as the footings are usually sufficient for this purpose.
6. Construction to be in accordance with IPWEAQ Standard drawings:
   a. FBD-102 Fencing - Chain Wire Security Fencing to be used unless higher security or hazard prevention required.
   b. FBD-105 Fencing - Tubular Steel Fence With & Without Chain Wire, Type 1A 1100 high for general settings for management in children setting or Type 1B 1350mm high;
   c. FBD-105 Fencing - Tubular Steel Fence With & Without Chain Wire, Type 2 1100 high tubular, to be used for:
      i. management of hazards;
      ii. maintenance operations; or
      iii. where in areas of overland flow constraints.
   d. GFBD-106 Fencing - Welded Mesh Fencing And Control Fence, where interfacing with higher risk hazards such as roads with design speed greater than 60km/hr.
7. In flood-prone locations beside creeks where vehicle barriers are required, bollards comply with IPWEA Standard drawing, FBD-103 Fencing - Log Barrier & Alternative Hardwood Timber Bollard.

## SC6.7.7.10 Fencing, bollards and lock rails

1. Vehicles should be prevented from driving into parks, drainage reserves and public open spaces by the provision of barriers along the road frontages. These may be barriers, bollards or natural features such as existing vegetation or newly planted and staked trees. Access for maintenance vehicles is to be provided through a lockable gate, lock rail or removable bollard in accordance with IPWEAQ Standard drawings:
   a. FBD-104 Fencing - Locking Rail Types 1, 2, & 3;
   b. FBD-108 Fencing - Entrance Barrier - Single Swing Gate;
   c. FBD-109 Fencing - Entrance Barrier - Double Swing Gate.
2. Definition of the park side boundaries should be indicated by installing barrier fencing or bollards at approximately 1.5m centres, down each side. These should be offset from the surveyed boundary by 100mm to allow future erection of private fencing without having to remove Council's markers. Definition of the park boundary is intended to deter encroachment onto the park by adjacent private properties and to define the park limits.
3. Barriers and bollards are to be in accordance with IPWEAQ Standard drawing, FBD-103 Fencing - Log Barrier & Alternative Hardwood Timber Bollard, unless otherwise approved.
4. Bollards are to be installed when a mountable kerb is installed. Bollards are often not required if a barrier kerb is installed and there are sufficient natural features deterring access.
5. Screen landscaping may be planted along the boundaries of neighbouring private properties, subject to CPTED assessments.

## SC6.7.7.11 Signage and wayfinding

1. Signage (park name and interpretive) in parks forms part of the overall design intent. An approved park name sign is required for land identification and location. Park signage may also inform and/or entertain users of the open space.
2. Walking track markers in natural area parks comply with AS 2156.1 Walking tracks - Classification and signage. The use of pictographic signage and any other measures that contribute to access and inclusion principles.
3. Traffic signs for internal circulation roads are provided as per the Manual of uniform traffic control devices (Department of Transport and Main Roads).
4. If the park has any historic, cultural or natural value the provision of interpretive signage will provide further interest to local users. Interpretive signs are to add value and educational information, where appropriate.
5. All interior and exterior signage is to comply with AS 1428.1: Design for access and mobility and:

   a. ensure the height of letters in signs shall be not less than that given in AS 1428.2 Design for access and mobility — Enhanced and additional requirements — Buildings and facilities, Table 2;
   b. key wayfinding (directional and information) signs include brail.
6. The design of signage is to:
   a. be coordinated;
   b. be legible;
   c. promote safe and appropriate use of the park;
   d. provide directional information between important destinations.
7. Signage must be practical, easy to maintain and maintain effective communication whilst minimising visual clutter.
8. Signs, sign poles, stands or bases are constructed from high durability materials that require minimal ongoing maintenance.
9. Where multiple signs are required in the same location, the signs are to be collocated on one structure where possible.
10. All signs in parks are to be designed in consultation with Council and include Council's logo.
11. Advertising signage is not permitted in parks.

## SC6.7.7.12 Utilities

### SC6.7.7.12.1 Electricity

1. An electricity supply pillar is provided on at least 1 park frontage, with a switchbox and supply to the electrical facilities in the park.
2. If required, a lockable general purpose outlet is provided and located outside of any switchbox.
3. The capacity of the electrical supply is sufficient to meet the power demands for the electrical facilities in the park (i.e. regional parks have provision for 3 phase power).
4. The type and number of electrical facilities are determined by the park type and as shown on the approved detailed landscape plan.
5. The electricity connections are located, designed and constructed to minimise impacts on existing landform, structures, use areas and vegetation.
6. Electrical infrastructure, in particular switchboards, is located to achieve the most realistic immunity from flooding.

### SC6.7.7.12.2 Sewer

1. Where reticulated sewerage connection is available, sewerage connections are:
   a. provided at the park boundary if public toilets or buildings are required;
   b. located at the closest point to the proposed development site in the park;
   c. denoted by permanent markers.
2. Where reticulated sewerage connection is not available, an appropriate disposal system will be determined in accordance with the Plumbing and Drainage Act.

### SC6.7.7.12.3 Water supply

1. Where a reticulated water supply or pressurised potable water is available, a 25mm water service connection is provided at the park boundary with a water meter.
2. At least 1 vandal-proof maintenance tap is provided within the park. Maintenance taps are provided in a park to facilitate cleaning and maintenance of infrastructure, turf and landscaping. In absence of an irrigation system, 1 maintenance tap on a 20mm vandal-proof standpipe should be provided for each 2,000$m^2$ of park.
3. Taps include a 20mm Council vandal-proof hose tap fitting.
4. Taps are located near the edge of the landscaping, turf or infrastructure and are to be maintained.
5. A tap does not pose a trip hazard or interfere with maintenance activities such as grass mowing.
6. Maintenance taps are attached to drinking fountains where appropriate.
7. A least 1 drinking water tap is located within 20m of a playground or other recreation facility.
8. Water supply connections and taps are located, designed and constructed to minimise impacts on existing landform and vegetation.
9. This section is to be read in conjunction with Urban Utilities' standards for water supply and connection.

## SC6.7.7.13 Lighting

1. Lighting systems are to influence the vitality and appearance of a place at night and enable legibility of space, lessen the risk of night-time accidents, and discourage crime and vandalism. Design and delivery for lighting in open and civic spaces is to:
   a. be designed to minimise impact on existing and adjacent premises whilst maximising user safety and vitality of a place;

b. complement and enhance the elements within a space and be incorporated into the overall design, rather than an add-on. Creative lighting is only to be used in high profile public areas;
c. lighting within pedestrian areas is to comply with:
    i. AS/NZS 1158.3.1 Lighting for Roads and public spaces;
    ii. AS 4282 Control of the obtrusive effects of outdoor lighting;
d. consist of light fittings that are to be appropriate for use in public spaces such as shatter proof and cool to touch glass, durable materials such as stainless steel and brass, suitability for in ground or exterior locations and impact resistance;
e. achieve a 20-year installation design life on all materials;
f. be located, where possible, to minimise the risk of damage, either on a pole out of harm's way, fixed into the ground or wall, fitted into a recess, or placed on the underside of furniture;
g. whilst ensuring public safety is not compromised, measures to minimise or mitigate adverse impacts of artificial lighting on wildlife should be pursued in ecologically sensitive areas;
h. before commencement of construction, an Operational Works development approval is to be obtained for all electrical works.

## SC6.7.7.14 Playgrounds

1. Play equipment complies with:
    a. AS 4485.0 Playground equipment and surfacing - Part 0: Development, installation, inspection, maintenance and operation;
    b. AS 4685.1 Playground equipment and surfacing - Part 1: General safety requirements and test methods;
    c. AS 4685.2 Playground equipment and surfacing - Part 2: Additional safety requirements and test methods for swings;
    d. AS 4685.3 Playground equipment and surfacing - Part 3: Additional safety requirements and test methods for slides;
    e. AS 4685.4 Playground equipment and surfacing - Part 4: Additional safety requirements and test methods for cableways;
    f. AS 4685.5 Playground equipment and surfacing - Part 5: Additional safety requirements and test methods for carousels;
    g. AS 4685.6 Playground equipment and surfacing - Part 6: Additional safety requirements and test methods for rocking equipment;
    h. AS 4422 Playground surfacing - Specifications, requirements and test methods;
    i. AS 2555 Supervised adventure playgrounds, Guide to establishment and administration.

### SC6.7.7.14.1 Surfacing

1. Playgrounds are to have rubberised or synthetic soft fall under play equipment where displacement of soft fall mulches is likely to occur. Soft fall depth must comply with AS 4422 Playground surfacing—Specifications, requirements and test methods. Consideration is to be given regarding fall zone softfall displacement under swings, fire poles and exit run-out for slides, Spica and rotating elements, carousels or spinning discs etc.
2. A soft fall area:
    a. has a minimum 250mm depth soft fall sand bed complying with AS 4422 Playground surfacing - Specifications, requirements and test methods above the subgrade;
    b. provides for free drainage from the sub-grade and no ponding to the sub-grade;
    c. is excavated to the levels shown on approved drawings.
3. The soft fall area is connected to the stormwater drainage.
4. If the soft fall area cannot be connected to the stormwater drainage:
    a. the outlets of the sub-soil drainage pipes are to be provided at a minimum of 3m from the play equipment pad;
    b. if the premises have sufficient fall to divert the flow, the flow is diverted via a turfed spoon drain, the profile of which is mowable, to the lowest point on the premises;
    c. if the premises do not have sufficient fall to divert the flow, the drainage pipe is to be discharged into a rubble pit of $1m^3$ water holding capacity for every $5m^2$ of softfall area. The pit is to be a minimum of 300mm below the sub-grade of the play equipment pad.
5. Select and locate shade trees so that tree roots do not compromise the softfall or create trip hazards in the fall zone at mature size.
6. Tree selection and planting ensures tree roots do not interfere with softfall or create trip hazards in the fall zone when they reach maturity.

### SC6.7.7.14.2 Playground design

1. Playground design is to respond to the local landscape character, demographics, demands and identity, through the choice of infrastructure and colour schemes. It is also to consider the function and role the playground and parklands plays in the overall network. Playgrounds are to be safe, fun, interesting, accessible and clearly visible from the main areas of the open space.

2. Playgrounds and associated structures should be consolidated within a single node to allow for adequate adult supervision of children and to help reduce future maintenance costs. Larger parks may have several playground nodes as required.
3. The following requirements apply to playground design and delivery:
   a. playgrounds are to provide adequate seating adjoining the playground under shade for supervision of play. The playground is to also have 1 bin adjacent to the playground;
   b. slides are installed facing south to reduce the effect of direct sunlight onto the slide surface unless otherwise shaded. Swings are to be installed facing north or south unless otherwise shaded;
   c. playgrounds are to have adequate separation from areas of higher hazard such as carriageways, car park areas, bikeways and water bodies. Landform, planting or fences may be used to provide separation from areas of higher hazard;
   d. playground equipment is to comply with:
      i. Workplace Health and Safety Standards;
      ii. AS 4685 Playground equipment and surfacing;
         A. Part 0 Development, installation, inspection, maintenance and operation;
         B. Part 1 General safety requirements and test methods;
         C. Part 2 Additional safety requirements and test methods for swings;
         D. Part 3 Additional safety requirements and test methods for slides;
         E. Part 4 Additional safety requirements and test methods for cableways;
         F. Part 5 Additional specific safety requirements and test methods for carousels;
         G. Part 6 Additional safety requirements and test methods for rocking equipment;
      iii. AS 4422 Playground surfacing—Specifications, requirements and test methods;
      iv. all other relevant statutory requirements, guidelines and standards;
   e. playgrounds are to contain adequate subsurface and surface drainage to avoid water ponding or nuisance;
   f. if geofabric is installed, the matting must be secured with small cable ties or some other approved measures on all joins and around elements to ensure that the matting does not rise to the surface and create a trip hazard and ongoing maintenance issue;
   g. the assembly of all playground equipment using nuts and bolts are to have thread lock applied so that bolts do not work their way loose and cause maintenance issues and damage to equipment;
   h. playgrounds are to be surrounded with an edge treatment and have a minimum fall zone consistent with:
      i. AS 4685 Playground equipment and surfacing (set);
      ii. AS 4422 Playground surfacing—Specifications, requirements and test methods;
   i. concrete edging shall be 200mm deep and 150mm wide with rolled edges.
4. Playground equipment is designed, constructed and installed according to the manufacturer's specifications and is compliant with Australian Standards. Certification is to be provided by a certified playground audit or before on maintenance.
5. The developer is to hand over maintenance instructions, parts and service manuals and manufacturers' guarantees for the playground equipment or any other documents to Council before acceptance on maintenance.
6. The developer is to provide to Council any construction or maintenance tools supplied with the purchase of the playground equipment before acceptance of the works off-maintenance.

## SC6.7.7.15 Facilities and embellishments

### SC6.7.7.15.1 Artwork

1. Artworks are located in a publicly visible location, such as the building facade or on publicly accessible sites such as a building forecourt.
2. If artwork is a freestanding structure positioned in the verge, it:
   a. does not impede sightlines to unsignalled intersections, pedestrian crossings, traffic signals and bus stops;
   b. is setback a minimum of 750mm from the nominal face of kerb;
   c. maintains the building shoreline where in the City Centre;
   d. does not impede clear access to all above ground and sub-surface services in the verge.
3. Artwork is to be designed to withstand contact with an appropriate number of people, climbing, pushing or pulling at the structures.
4. Artwork is designed to:
   a. ensure safety for members of the public from all age groups in all weather conditions;
   b. contain no protrusions which might cause injury if accidentally collided with;
   c. avoid entrapment of any part of a person (e.g. fingers);
   d. be resistant to vandalism;
   e. have low ongoing maintenance liability.
5. Artwork has a minimum design life of 25 years.
6. A detailed maintenance document, incorporating as-constructed drawings, installation method, cleaning and re-finishing schedule as well as a list of key contacts such as fabricator, artist and supplier is provided with the artwork.

### SC6.7.7.15.2 Barbeques

1. Barbeques are located as part of a picnic node in compliance with section 7.7.15.4 Picnic nodes and in on elevated part of the site to provide flood immunity.
2. Barbeques are designed to have:
   a. stainless steel surfaces and cabinet with a vandal resistant finish;
   b. low maintenance — easy to clean food grade finish;
   c. lockable door with fat collection tray with waste bags supplied inside cabinet;
   d. bolted down to relevant engineered concrete surface in accordance with appropriate standards.
3. Barbeques wiring and electrical services are to be completed by licensed electrician.
4. Circulation areas around barbeques are consistent with AS 1428.1 Design for access and mobility - General requirements for access.

### SC6.7.7.15.3 Drinking fountains and bubblers

1. Drinking fountains or bubblers are provided:
   a. along district and regional pathway and bikeway networks;
   b. near playgrounds and active recreation nodes.
2. A dog drinking bowl is added where dogs are walked, and in dog off leash areas where visitor use is high, but not near playgrounds or other active recreation nodes.
3. Stormwater connections are not located adjacent to drinking fountains. A soak-away trench is to be provided to the base of each tap to prevent ponding and waterlogging.

### SC6.7.7.15.4 Picnic nodes

1. Picnic nodes are located in attractive, shady and accessible locations in District and Regional, parks, and typically incorporate:
   a. a shelter;
   b. picnic setting;
   c. barbecue;
   d. refuse bin;
   e. tap and drinking fountain.
2. Picnic nodes in parks:
   a. are located at focal points or adjoining features or places of special interest in a park, but not where they will detract from that feature;
   b. in natural area parks and are located in accordance with the approved natural area management plan;
   c. complement and enhance other recreation opportunities in a park;
   d. are sited in conjunction with playgrounds and other activity spaces with access to facilities such as bicycle paths;
   e. subject to the terrain of the site and have continuous accessible paths of travel from car parks or adjoining roads and park facilities;
   f. have all-weather access for regular cleaning and maintenance;
   g. use alternative technologies where appropriate (e.g. solar energy where mains power is not readily available, or rainwater harvesting).
3. The type of picnic node provided in a park is consistent with the park type and its significance, established during the park design.
4. The standards for provision of furniture in picnic nodes are listed in Part 4 Local Government Infrastructure Plan.

### SC6.7.7.15.5 Rubbish bins

1. Bins provided in parks are located:
   a. near a road;
   b. at pedestrian entry points;
   c. near BBQ areas, seats and tables;
   d. adjacent to walking trails and dog off leash areas;
   e. close to access point where they can be readily serviced without the need to drive the refuse collection truck across the park.
2. Bins are to be:
   a. 240L in all cases (potential twin as general waste and recycle);
   b. housed in a fireproof wheelie bin enclosure;
   c. placed on a concrete apron slab;
   d. approved by Council before installation has occurred.

### SC6.7.7.15.6 Seats

1. Seats are located:
   a. in areas with interesting outlooks;
   b. where they can obtain maximum shade;
2. Seats are located close to:
   a. a playground or active recreation node;
   b. around sporting fields;
   c. at viewpoints;
   d. at resting points setback from and along pathways;
   e. near top and bottom of any significant ramping;
   f. spaced no greater than 60m spacings.
3. Seats are to be constructed with the following:
   a. aluminium or timber. If seats are aluminium, they are required to be light in colour to reduce the potential for heat reflection and seats being hot. Timber seats are required to have at least 3 coats of sealer such as Ultradeck or Tanner coat or the equivalent before installation;
   b. anti-vandal fixtures.

### SC6.7.7.15.7 Shelters and gazebos

1. If shelters are required in parks, they are sited as part of a picnic node, playground node or other activity node.
2. Gazebos may be provided in attractive park settings for weddings and group functions.
3. Shelters and gazebos incorporate picnic settings or seating depending upon their function in the park.
4. Structures are to be an integral part of the open space landscape providing local identity and unique space for community and visitor gatherings.
5. Built structures, including shelters, are required to be:
   a. consistent with the relevant local plan code and relevant building, engineering and electrical standards;
   b. appropriately located within the landscape, being complementary to the immediate landscape and urban design;
   c. constructed with impervious roofs that maximise rain and sun protection, where intended to provide shelter and for harvesting of rainwater where appropriate;
   d. orientated to maximise shelter from sun, rain and wind;
   e. of construction that requires minimal maintenance and be fit for purpose, durable and safe.
6. Shelters and gazebos for park facilities are required to be fit for purpose, durable, robust and safe and installed in locations for equal access locations. Shelter and gazebos are required to be:
   a. manufactured to engineer’s specifications, Australian Standards and National Construction Code and be installed in accordance with all certification requirements mentioned further below;
   b. roofing to be Colorbond with light colour preferred to assist with heat reflection;
   c. fixing and fasteners to be correct class for roofing type in accordance with SS316;
   d. post anchors or stirrups if must be engineered in accordance with the relevant Australian standards;
   e. concrete and slab to be installed in accordance with structural engineering requirements for shelter with slabs extending pass the shelter roof by a minimum of 500mm and allow sufficient cross fall to ensure water does not pool on slab;
   f. if necessary due to the location of the shelter shade slats to be installed to assist with sun protection. Material of slats can consist of aluminium, steel or timber.

### SC6.7.7.15.8 Public toilets

1. Public toilets buildings are only provided in parks after an objective assessment of potential demand and, where applicable, consideration of the availability of conveniently located alternative non-Council facilities. Anticipated demand is categorised as follows:
   a. High-level: High and consistent level of everyday toilet use by park visitors, throughout week;
   b. Peak-period: Lower overall level of use, with a peak at weekends or during park functions, sporting events, etc.;
   c. Low-level: Low or sporadic public use;
   d. Group: Use is primarily associated with the activities of a single club, group, tenant or lessee. Lessees will usually provide a toilet within a clubhouse or other community building for group use.
2. Based on demand, there is a requirement for toilets in many Regional parks, and to a lesser extent in District and Sport parks, where high-level or peak-period demand exists.
3. Toilets are not provided in Local parks, landscape amenity and linear corridor parks.
4. The type of a public toilet building provided in a park shall be consistent with the park type and its significance, established during the park design and development assessment process and any unique park characteristics, such as natural values.
5. All relevant certification, as constructed drawings, operation manuals and manufacturers' guarantee and warranties are to be provided prior to acceptance of on-maintenance.
6. Public toilets are to comply with Building and Plumbing legislation and regulations, including, but not limited to:

a. Disability Discrimination Act (Cth);
b. National Construction Code (NCC);
c. Building Code of Australia;
d. Queensland Plumbing and Wastewater Code.

### SC6.7.7.15.9 Location of public toilets

1. Public toilet buildings are located:
   a. near adjacent pedestrian paths, roads and facilities, with entrances facing onto most active space;
   b. in an area highly visible from most directions;
   c. in an area where there are activity generators (e.g. picnic facilities);
   d. so that vegetation around the building is an appropriate type and size;
   e. so that the buildings are responsive to Crime Prevention Through Environmental Design principles.

### SC6.7.7.15.10 Design standards for public toilets

1. Unisex toilet facilities are desirable for areas identified for low use.
2. Gender-specific toilet facilities are desirable for areas of high use.
3. If 1 cubicle is provided, it is a unisex toilet.
4. If more than 1 cubicle is provided, a minimum of 1 cubicle is designed to be disability accessible.
5. No screened lobby or any type of enclosed communal lobby is provided to public toilets.
6. Solid, fully enclosed buildings with a single common access is not appropriate.
7. Cubicles are self-contained including a handbasin and open directly onto public space.
8. If a cubicle is not large enough to accommodate handbasins (e.g. for ambulant facilities), the cubicle opens directly onto public space and handbasins are located outside in the public space.
9. If a handbasin is located outside a cubicle, it is not screened.
10. Provision of a translucent lightweight screened approach or handbasin lobby with continuous gaps to ground level is appropriate to ensure maximum visibility.
11. Direct entry to cubicle configuration ensures:
    a. entry into a cubicle is to be through cubicle door only;
    b. the vertical design plane is assessed to eliminate wherever possible ‘steps’ or ‘ladders’ that could aid access and provide the opportunity for people to climb.
12. A permeable screen is incorporated between the top of all internal and external cubicle walls and doors and the underside of the roof to assist with ventilation.
13. Walls are solid and durable.
14. Door closers incorporated into hinges or pivots are provided with a gap (75mm—300mm) to the underside of cubicle doors.
15. Roofing of a cubicle that opens directly onto a public space has generous overhang or a veranda.
16. All building finishes are robust, impact-resistant, weather-resistant, flood-resistant, easily cleaned, graffiti-resistant and comply with relevant Australian Standards.
17. The floor of a public toilet:
    a. is of a mid-to-dark colour to hide dirt and grime;
    b. is easy to repair and maintain (e.g. broom-finished concrete);
    c. is a resilient, hard surface conforming to the required Australian Standard;
    d. is slip resistant;
    e. slopes down to a drain to avoid the accumulation of water inside.
18. Exterior and interior finishes and treatments are treated to minimise graffiti and vandalism.
19. If brick or concrete, interior and exterior walls are rendered and painted or treated with an anti-graffiti coating.
20. Exterior walls have a dark base colour.
21. Multi-coloured murals that are consistent with the surroundings, or treatments that vary the materials, colours and surfaces, are used to disrupt smooth, blank continuous surfaces on exterior walls.
22. Internal door faces have a protective anti-graffiti coating or stainless steel finish.
23. External finishes do not generate obtrusive glare and reflection for surroundings.
24. If a public toilet facility is to be used at night, internal and external lighting is provided.
25. Skylights are used where possible for natural light.
26. The minimum illumination level inside each toilet cubicle meets the relevant Australian Standards.

### SC6.7.7.15.11 Fixtures and fittings

1. Handbasins are of stainless steel with vandal-resistant fixings and stainless steel or chromed brass drainage pipes.
2. Porcelain fixtures are not used.
3. If the risk of vandalism is high, stainless steel toilet pans are provided with an integrated seat and vandal-resistant fixings.
4. If the risk of vandalism is low, separate toilet seats (PVC or porcelain) can be used.

5. All pipework including drainage pipes under handbasins are concealed within a stainless steel enclosure with vandal-proof fixings that is able to be accessed for maintenance.
6. Supply and drainage pipework is concealed in ducts where possible.
7. Urinals are not installed.
8. Tapware is robust and vandal proof, fitted with spring shut-off valve function to regulate water consumption.
9. Tapware replacements are readily available from major manufacturers.
10. All plumbing fixtures and fittings are selected, installed and managed with water conservation as a priority.
11. Exposed cisterns are avoided.
12. Door hardware:
    a. is robust and vandal proof;
    b. replacements are readily available from major manufacturers;
    c. identifies when a toilet cubicle is in use.
13. Clothing hooks are not provided in ambulant toilets.
14. Mirrors, if provided, are stainless steel unless specifically requested otherwise.
15. Toilet roll holders are robust and secure.
16. Handbasins with flat surrounds also serve as shelves and shelves are not provided.
17. If the risk of vandalism is low, and paper towel dispensers are not provided, a sensor-activated hand dryer can be installed.
18. If the risk of vandalism is low, a storeroom to allow ease of access for servicing of toilets as well as the ability to store materials is provided. The room will require adequate ventilation and be secured by a lockable door.
19. Internal and external light fittings are energy efficient, high mounted and vandal resistant.
20. LED lighting for safety and security is provided with a PE cell on and off timer system for energy efficiency.

#### SC6.7.7.15.12 Signage

1. Directional signage considers use by people with vision impairments in accordance with Disability Standards (Access to Premises - Building), Part D4 - which includes the use of braille characters on all signs.
2. The designation (gender use and mix) is clearly signed in language and symbol.

#### SC6.7.7.15.13 Accessible toilets

1. A minimum of one cubicle is provide as disability accessible public toilet is provided and designed in accordance with AS 1428.1 Design for access and mobility — General requirements for access - New building work and includes:
    a. a handbasin inside the cubicles;
    b. a soap dispenser that is surface mounted stainless steel;
    c. grab rails secured to the structural frame or solid block work.

#### SC6.7.7.15.14 General standards

1. The layout of public toilet includes the following:
    a. installation of unisex cubicles with direct access to a common area with one or more hand basins;
    b. hand basins and fixtures to be stainless steel with anti-vandal fixtures;
    c. soap dispensers to are to be surface mounted stainless steel, with soap being dispensed by pressing of a button and comply with AS 1428 Design for access and mobility Part 1: General requirements for access—New building work;
    d. the toilet is required to have a minimum of one cubicle that is person with disability compliance;
    e. toilet pans are to be stainless steel wall faced type with concealed pipework;
    f. in certain locations, a baby change table may be required as a part of the public toilet facility;
    g. service corridor or storeroom to allow ease of access for servicing of toilets as well as the ability to store materials if necessary. The room will require adequate ventilation and be secured by a lockable door;
    h. all interior and exterior signage is to comply with AS 1428 Design for access and mobility Part 1: General requirements for access—New building work, and to identify the facilities available within and outside the building;
    i. provide internal and external vandal resistant LED lighting for safety and security. Light fixtures to be connected to a PE cell on and off timer system for energy efficiency

### SC6.7.7.16 Recreation and sporting facilities

#### SC6.7.7.16.1 Ball sports facilities

1. The type of facility provided for ball sports in a park shall be consistent with the park type and its significance, established during the park design and development assessment process and any unique park characteristics.
2. Facilities for ball sports in parks (e.g. basketball and netball courts, tennis courts, rebound walls, cricket practice nets, boules courts, grassed fields, ovals, cricket pitches) are designed, located and constructed in accordance with standard

sporting field dimensions and the following general requirements:

a. ensure the facility complements and enhances other recreation opportunities in a park or open space. All facilities shall be set apart to allow ball sports to take place without intrusion and conflicts with adjoining activities;
b. ensure the facility is readily maintainable and approved by Council;
c. ensure the facility is setback from surrounding properties with screening and landscaping as appropriate. Consultation with neighbours and Council is required if the facility is proposed near existing or future residences. Small local parks are usually unsuitable for facilities for ball sports;
d. keyways or goal circles (combined basketball and netball ring or a facility with minimum court area) are not acceptable due to risks associated with these facilities;
e. maximise opportunities for casual surveillance of courts and rebound walls from surrounding streets and/or other sites of regular people presence;
f. provide half courts and tennis rebound walls within cycling distance (approximately 2—5km of most residences);
g. tennis courts and boules courts (bocce) are not usually provided outside leased areas in parks. An exception is where a community group or agency can undertake minor court maintenance, care for equipment such as nets, and supervise court bookings;
h. cricket practice nets shall be located to minimise potential hazards caused by mishit cricket balls. Practice nets shall not be located along road frontages, to minimise potential hazards and to maintain the visual appeal of the park;
i. bench seats, drinking fountains and tree planting for shade are provided in conjunction with facilities for ball sports.

### SC6.7.7.16.2 Dog off leash areas

1. District and Regional recreation parks are the preferred location for dog off-leash areas.
2. The location of dog off-leash areas in parks is determined by Council and noted in Council's local laws.
3. Dog off-leash areas:
   a. complement and enhance other recreation opportunities in a park;
   b. do not cause nuisance to adjacent properties;
   c. are easily maintainable by Council;
   d. where created within a larger area of open space, must be clearly defined within a fence consistent with section SC6.7.7.9 Fencing and barriers;
   e. are clearly signed at every entry point to the off-leash area using standard Council signage;
   f. are hospitable for people and dogs, with an open area of useable space, shade, seating and drinking water for people and dogs;
   g. use tree planting to supplement shade over time;
   h. do not have hazards such as holes, depressions, irregular or stony surfaces, constantly wet areas or any other feature which may contribute to an injury, or a more suitable area is chosen;
   i. have access points located so that a conflict will not arise between users accessing the off-leash area or users of other park facilities;
   j. provide at least 1 bin for dog faeces consistent with section SC6.7.7.15.5 Rubbish Bins;
   k. provide at least 1 anti-vandal tap, fountain and drinking bowl;
   l. are an appropriate size for the intended use and anticipated demand.

### SC6.7.7.16.3 Fitness equipment

1. Fitness equipment is located in District and Regional recreation parks.
2. Fitness equipment may be installed along pathways in parks and around activity spaces.
3. Fitness equipment is setback a minimum distance of 2.5m from bikeways and pathways to provide circulation space.
4. Fitness equipment can contain fixed equipment as well as dynamic equipment activated by body weight.
5. Fitness equipment is location out of and away flood prone area.
6. General considerations of fitness equipment include:
   a. provide options for full body workouts, these options to include cardiovascular and resistance training;
   b. designed to be ergonomically correct;
   c. fitness equipment to be stainless steel, aluminium and HDPE or poly panels, with components and parts to be repairable and sourced;
   d. site locations to consider passive surveillance to assist with anti-social behaviour at fitness equipment
7. Installation and ongoing maintenance of fitness equipment is to be consistent with the following:
   a. static designed exercise stations installed to manufacturer's specifications. All equipment is to meet safety standards and fall zone requirements of:
      i. AS 4685 Playground equipment safety and surfacing;
      ii. AS 4422 Playground surfacing - Specifications, requirements test method;
      iii. AS 16630 Permanently installed outdoor fitness equipment — safety requirements and test methods;
   b. trowel finished rubberised surfacing to meet:
      i. AS 4422 Playground surfacing - Specifications, requirements and test method;
      ii. AS 4685 Playground equipment safety and fall heights over a compacted base with adequate drainage installation under exercise stations;

c. erection of a park activity entry sign adjacent to the exercise equipment before the acceptance of the works on maintenance in accordance with
   i. AS 4685 Playground equipment safety;
   ii. AS 16630 Permanently installed outdoor fitness equipment — safety requirements and test methods;
d. certification from the fitness equipment manufacture that all equipment has been installed to their specifications and in accordance with:
   i. AS 4685 Playground equipment safety (set);
   ii. AS 4422 Playground surfacing - Specifications, requirements and test methods.

8. Vandal proof signage is provided for fitness equipment to explain how it is used.
9. All relevant certification, as constructed drawings, operation manuals and manufacturers' guarantee and warranties are to be provided at practical completion.

### SC6.7.7.16.4 Skateboarding and BMX

1. Skateboarding facilities will be developed in accordance with Council.
2. Skateboard and BMX facilities cater for a wide ability range, from novice to experienced skaters and cyclists seeking the highest degree of challenge that is possible in an open public setting.
   Design and construction of skateparks is to be consistent with the following:
   a. AS 14974 Skateparks — safety requirements and test methods. Specifies safety requirements and requirements for testing and marking, information supplied by the manufacturer, information for users, as well as for inspection and maintenance to protect users and third parties (e.g. spectators) from hazards, as far as possible, when using a skatepark as intended, or as can be expected;
   b. AS 1170.1 Structural design actions — Permanent, imposed and other actions. For permanent, imposed, static liquid pressure, ground water, rainwater ponding and earth pressure actions to be used in the limit state design of structures and parts of structures;
   c. AS 1170.2 Structural design actions — Wind actions. Procedures for determining wind speeds and actions to be used in the design of structures;
   d. AS 1170.4 Structural design actions — Earthquake actions in Australia. Procedures for determining earthquake actions and detailing requirements for structures and components to be used in the design of structures;
   e. AS 1379 Specification and supply of concrete. Sets out minimum requirements for materials, plant and equipment used in the supply of concrete and the testing of concrete;
   f. AS 3600 Concrete structures. Provides nationally accepted rules for the design and detailing of concrete structures, members and footings;
   g. AS 3661 Slip resistance of pedestrian surfaces — Guide to the reduction of slip hazards. Guidance on the selection, installation, care and maintenance of flooring and other surfaces in domestic, public and commercial areas for the purpose of reducing the slip hazard to pedestrians, including people with disabilities;
   h. AS 4586 Slip resistance classifications of new pedestrian surface materials. Testing of new products and floors.

## SC6.7.7.17 Water bodies, water quality management and stormwater infrastructure

1. Water quality management and stormwater infrastructure is located away from park activity areas unless specifically designed for recreation use.
2. Water quality management and stormwater infrastructure does not impede the recreation function of a park, and where possible complement and enhance recreation opportunities and the park landscape.
3. Council is unlikely to accept a lake as part of a park contribution. A lake is defined as a large body of open water with the primary function of providing visual or recreational amenity. This definition does not apply where stormwater treatment is proposed to be a significant function of the lake.
4. Detailed information on the requirements relating to water bodies, detention basins and water quality management structures are to meet are provided in Planning Scheme Policy 6 Infrastructure design.

# SC6.7 Appendix 1: Preferred landscaping species

1. The following tables are a guide to species of trees, shrubs and ground covers that generally perform well and require minimal maintenance in roadside landscaping.
2. These lists are deliberately not comprehensive as final species choices should be based on professional site condition analysis and advice from a suitably qualified landscape architect or horticulturist.

## SC6.7.8 Tree, shrubs and ground covers

| SCIENTIFIC NAME | COMMON NAME | LOCATION |
|---|---|---|
| **Palms** | | |
| *Archontophonix cunninghamiana* | Bangalow Palm | All areas |
| *Livistona australius* | Cabbage-tree palm | All areas |
| *Livistona decora* | Ribbon palm | All areas |
| **Large trees greater than 12m** | | |
| *Acacia blakei* | Wollomombi Wattle | Rural and Rural Residential areas |
| *Acacia disparrima* | Hickory | Rural and Rural Residential areas |
| *Acacia harpophylla* | Brigalow | Rural and Rural Residential areas |
| *Agathis robusta* | Queensland Kauri | Rural and Rural Residential areas |
| *Alphitonia excelsa* | Soap tree | Rural and Rural Residential areas |
| *Angophora leiocarpa* | Smooth Barked Apple | Rural and Rural Residential areas |
| *Brachychiton discolor* | Lacebark tree | Rural and Rural Residential areas |
| *Brachychiton rupestris* | Narrow-leaved bottle tree | Rural and Rural Residential areas |
| *Buckinghamia celsissima* | Ivory curl | Rural and Rural Residential areas |
| *Casuarina cristata* | Belah | Rural and Rural Residential areas |
| *Eucalyptus crebra* | Narrow-leaved ironbark | Rural and Rural Residential areas |
| *Eucalyptus microcorys* | Tallowwood | Rural and Rural Residential areas |
| *Eucalyptus propinqua* | Grey gum | Rural and Rural Residential areas |
| *Eucalyptus saligna* | Sydney blue gum | Rural and Rural Residential areas |
| *Eucalyptus siderophloia* | Northern grey ironbark | Rural and Rural Residential areas |
| *Eucalyptus tereticornis* | Forest red gum | Rural and Rural Residential areas |
| *Flindersia australis* | Crow's Ash | Rural and Rural Residential areas |
| *Flindersia collina* | Leopard wood | Rural and Rural Residential areas |
| *Flindersia xanthoxyla* | Yellow Wood | Rural and Rural Residential areas |
| *Grevillea robusta* | Silky oak | Rural and Rural Residential areas |
| *Lophostemon confertus* | Brush box | Rural and Rural Residential areas |
| *Brachychiton acerifolius* | Flame Tree | All areas |
| *Syzygium australe* | Lilly-pilly or Scrub cherry | Rural and Rural Residential areas |
| *Syzygium crebrinerve* | Rose satinash | Rural and Rural Residential areas |
| *Xanthostemon chrysanthus* | Golden Penda | All areas |
| **Medium trees 7-12m** | | |
| *Abrophyllum ornans* | Native Hydrangea | All areas |
| *Allocasuarina torulosa* | Forest oak | All areas |

| | | |
|---|---|---|
| *Backhousia citriodora* | Lemon-scented myrtle | All areas |
| *Brachychiton populneus* | Kurrajong | All areas |
| *Buckinghamia celsissima* | Ivory Curl Tree | All areas |
| *Bursaria incana* | Prickly pine | All areas |
| *Callistemon salignus* | White Bottle Brush | All areas |
| *Cassia tomentella* | Velvet scrub cassia | All areas |
| *Cupaniopsis anacardioides* | Tuckeroo | All areas |
| *Cupaniopsis parvifolia* | Small-leaved tuckeroo | All areas |
| *Elaeocarpus reticulatus* | Blueberry Ash | All areas |
| *Grevillea baileyana* | White Oak | All areas |
| *Grevillea banksii* | Banks Grevillea | All areas |
| *Glochidion ferdinandii* | Cheese tree | All areas |
| *Hakea Lorea* | Gnarled Corkbark | All areas |
| *Harpullia pendula* | Tulipwood | All areas |
| *Hymenosporum flavum* | Native frangipani | All areas |
| *Toona ciliata* | Red cedar | All areas |
| *Waterhousea floribunda* | Weeping lilli pilli | All areas |
| *Lophostemon confertus* | Brush Box | All areas |
| *Lophostemon suaveolens* | Swamp Box | All areas |
| *Melaleuca leucadendra* | Weeping Paperbark | All areas |
| *Melaleuca quinquenervia* | Broad Leaved Paperbark | All areas |
| *Stenocarpus sinuatus* | Firewheel Tree | Rural and Rural Residential areas |
| *Syzygium luehmannii* | Small Leaved Lilly Pilly | Rural and Rural Residential areas |
| *Tristaniopsis laurina* | Water Gum | All areas |
| **Small trees 5m-7m** | | |
| *Acacia concurrens* | Black wattle | All areas |
| *Acacia granitica* | Granite wattle | All areas |
| *Alectryon subdentatus* | Hairy birds-eye | All areas |
| *Babingtonia sp.* | Twiggy Babingtonia | All areas |
| *Backhousia citriodora* | Lemon Scented Myrtle | All areas |
| *Backhousia myrtifolia* | Grey myrtle | All areas |
| *Banksia integrifolia* | Coastal banksia | All areas |
| *Banksia robur* | Swamp banksia | All areas |
| *Brachychiton bidwillii* | Little Kurrajong | All areas |
| *Bursaria incana* | Prickly pine | All areas |
| *Cordyline petiolaris* | Broad-leaved palm-lily | All areas |
| *Cordyline rubra* | Small palm-lily | All areas |
| *Eremophila sp.* | Emu bushes | All areas |
| *Eucalyptus 'Summer Beauty'* | Pink Flowering Gum | All areas |
| *Eucalyptus 'Summer Red'* | Red Flowering Gum | All areas |
| *Hibiscus splendens* | Splenided hibiscus | All areas |

| | | |
|---|---|---|
| *Hibiscus tiliaceus rubra* | Bronze Cottonwood | All areas |
| *Hymenosporum flavum* | Native Frangipani | All areas |
| *Lagerstroemia indica* | Crepe Myrtle | All areas |
| *Melaleuca salignus* | Weeping bottlebrush | All areas |
| *Notelaea lloydii* | Lloyd's native olive | All areas |
| *Pavetta australiensis* | Butterfly bush | All areas |
| **Small trees or shrubs 2-5m** | | |
| *Acacia amblygona* | Fan wattle | All areas |
| *Acacia complanata* | Flat-stemmed wattle | All areas |
| *Acacia falcata* | Hickory wattle | All areas |
| *Acacia fimbriata* | Brisbane wattle | All areas |
| *Acacia myrtifolia* | Mrytle acacia | All areas |
| *Acacia neriifolia* | Nerine-leaved wattle | All areas |
| *Alectryon coriaceus* | Beach birds-eye | All areas |
| *Aotus ericiodes* | Common Aotus | All areas |
| *Aotus lanigera* | Hairy Aotus | All areas |
| *Banksia oblongifolia* | Dwarf Banksia | All areas |
| *Boronia rosmarinifolia* | Splendid boronia | All areas |
| *Commersonia bartramia* | Brown kurrajong | All areas |
| *Dodonaea megazyga* | Showy hop bush | All areas |
| *Dodonaea triangularis* | Ducksfoot hop bush | All areas |
| *Dodonaea viscosa subsp. Cuneata* | Sticky hop bush | All areas |
| *Dodonaea viscosa subsp. Viscosa* | Sticky hop bush | All areas |
| *Hovea acutifola* | Purple pea-bush | All areas |
| *Indigofera brevidens* | Pink pea bush | All areas |
| *Indigofera australis* | Forest indigo or Austral indigo | All areas |
| *Jacksonia scoparia* | Dogwood | All areas |
| *Leptospermum liversidgei* | Olive tea-tree | All areas |
| *Myoporum acuminatum* | Boobialla | All areas |
| *Olearia elliptica* | Scrub daisy | All areas |
| *Senna coronilloides* | Brigalow senna | All areas |
| *Syzygium fancisii* | Giant water gum | All areas |
| **Groundcovers or climbers** | | |
| *Ajuga australis* | Australian bugle | All areas |
| *Austromyrtus dulcis* | Midyim Berry | All areas |
| *Austrostipa ramossima* | Stout Bamboo grass | All areas |
| *Bacopa monnieri* | Bacopa | All areas |
| *Banksia oblongifolia* | Dwarf Banksia | All areas |
| *Baeckea frutescens* | Weeping Baecka | All areas |
| *Bouganvillea sp.* | Pink Donya | All areas |
| *Bouganvillea sp.* | White Donya | All areas |

| | | |
|---|---|---|
| *Bouganvillea sp.* | Penelope (white) | All areas |
| *Brachyscome multifida var. multifida* | Cut-leaved daisy | All areas |
| *Brunonia australis* | Blue Pincushion | All areas |
| *Bulbine bulbosa* | Native leek | All areas |
| *Burchardia umbellata* | Milkmaids | All areas |
| *Chrysoephalum apiculatum* | Yellow buttons | All areas |
| *Cleistochloa subjuncea* | A grass | All areas |
| *Crinum angsutifolium* | Field lily | All areas |
| *Crinum pedunculatum* | Brisbane River lily | All areas |
| *Cymbopogon refractus* | Barbed-wire grass | All areas |
| *Daviesia mimosoides* | Golden Pea | All areas |
| *Dianella brevipendunculata* | Tall flx-lily | All areas |
| *Grevillea Scarlet Sprite* | Grevillea | All areas |
| *Grevillea juniperina Molonglo* | Grevillea | All areas |
| *Grevillea juniperina Red* | Grevillea | All areas |
| *Grevillea Poorinda Royal mantle* | Grevillea | All areas |
| *Hardenbergia violacea* | Native sarsparilla | All areas |
| *Hemerocallis cultivars* | Day Lily | All areas |
| *Imperata cylindrica* | Blady grass | All areas |
| *Myoporum ellipticum* | Coastal Myoporum | All areas |
| *Myoporum acuminatum 'prostrate'* | Creeping water bush | All areas |
| *Pandorea jasminoides* | Trunpet Creeper | All areas |
| *Paspalidium spp.* | Panicgrass | All areas |
| *Sarga leiocladum* | Wild sorghum | All areas |
| *Scaevola aemula* | Fairy Fan-flower | All areas |
| *Tetratheca thymifolia* | Thyme Pink-bells | All areas |
| *Themeda triandra* | Kangaroo grass | All areas |
| *Tulbaghia violecea* | Society Garlic | All areas |
| *Viola banksii* | Banks violet | All areas |
| *Westringia sp.* | Rosemary | All areas |
| *Zieria cytisoides* | Downy zieria | All areas |

## SC6.7.9 Wetland or aquatic species

| SCIENTIFIC NAME | COMMON NAME |
|---|---|
| *Alternanthera denticulata* | Lesser joy weed |
| *Azolla filiculoides* | Pacific azolla |
| *Azolla pinnata* | Ferny azolla |
| *Baumea articulata* | Joint twig rush |
| *Baumea juncea* | Bare twig rush |
| *Baumea rubiginosa* | Soft twig rush |
| *Bolboschoenus caldwellii* | Jointed rush |

| | |
|---|---|
| *Brasensia schreberi* | Water shield |
| *Callistomon viminalis* | Weeping bottlebrush |
| *Carex appressa* | Tall sedge |
| *Carex brunnea* | Greater brown sedge |
| *Carex fascicularis* | Tassel sedge |
| *Carex gaudichaudiana* | Tufted sedge |
| *Carex inversa* | Knob sedge |
| *Carex lophocarpa* | Sedge |
| *Ceratphyllum demertum* | Hornwort |
| *Chara sp.* | Stonewort |
| *Cycnogeton procerum* | Water ribbons |
| *Cynodon dactylon* | Green couch |
| *Cyperus bifax* | Western nut grass |
| *Cyperus difformis* | Rice sedge |
| *Cyperus exaltatus* | Tall flat sedge or giant sedge |
| *Cyperus flaccidus* | Sedge |
| *Cyperus gunnii* | Sedge |
| *Cyperus haspan* | Sedge |
| *Cyperus leiocaulon* | Sedge |
| *Cyperus lucidus* | Sedge |
| *Cyperus mirus* | Sedge |
| *Cyperus odoratus* | Sedge |
| *Cyperus polystachyos* | Bunchy sedge |
| *Cyperus sanguilentus* | Sedge |
| *Cyperus squarrous* | Bearded flat sedge |
| *Damasonium minus* | Starfruit |
| *Eclipta prostrata* | White eclipta |
| *Eleocharis cylindrostachys* | Spike rush |
| *Eleocharis dietrichiana* | Spike rush |
| *Eleocharis dulcis* | Chinese water chestnut |
| *Eleocharis equisetina* | Spike rush |
| *Eleocharis philippinensis* | Spike rush |
| *Eleocharis plana* | Ribbed spike rush |
| *Eleocharis sphacelata* | Tall spike rush |
| *Eleocharis spp.* | Spike-rush |
| *Eragrostis brownie* | Browns love grass |
| *Eryngium vesiculosum* | Prostrate blue devil |
| *Eucalypus tereticonis* | Qld blue gum |
| *Fimbristylis aestivalis* | Summer fimbry |
| *Fimbristylis depauperate* | Sedge |
| *Fimbristylis dichotoma* | Common finger rush |

| | |
|---|---|
| *Fimbristylis ferruginea* | Rusty sedge |
| *Fimbristylis velata* | Finger rush |
| *Fincinia nodosa* | Knobby club-rush |
| *Fuirena incrassate* | Umbrella sedge |
| *Gahnia aspera* | Saw sedge |
| *Gahnia sieberiana* | Red-fruited saw sedge |
| *Halosarcia halocnemoides* | Samphire |
| *Hydrilla verticillata* | Water thyme |
| *Juncus aridicola* | Tussock rush |
| *Juncus continuus* | Rush |
| *Juncus polyanthemus* | Rush |
| *Juncus subsecundus* | Rush |
| *Juncus usitatus* | Common rush |
| *Leersia hexandra* | Swamp ricegrass |
| *Lemma sp.* | Duck weed |
| *Lepironia articulata* | Rush |
| *Lomandra confertifolia* | Little mat-rush |
| *Lomandra hystrix* | Green mat-rush |
| *Lomandra longifolia* | Spiny-head mat-rush |
| *Ludwegia octovalvis* | Willow primrose |
| *Marsilea drummondii* | Common nardoo |
| *Marsilea mutica* | Nardoo |
| *Melaleuca bracteata* | Black tea-tree |
| *Melaleuca irbyana* | Swamp tea tree |
| *Melaleuca linariifolia* | Snow in summer |
| *Melaleuca quinuenervia* | Broadleaf paperbark |
| *Melaleuca sieberi* | Small leaved tea tree |
| *Monochoria cyanea* | Swamp hyancinth |
| *Myriophyllum errucosum* | Watermilfoil |
| *Myriophyllum sp.* | Watermilfoil |
| *Myriophyllum striatum* | Watermilfoil |
| *Najas tenuifolia* | Water nymph |
| *Nitella sp.* | Stonewort |
| *Nymphaea gigantea* | Giant waterlily |
| *Nymphaea sp.* | Waterlily |
| *Nymphaea violacea* | Native waterlily |
| *Nymphoides indica* | Water snowflake |
| *Ottelia ovlifolia* | Swamp lily |
| *Paspalum distichum* | Water couch |
| *Persicaria attenuata* | White Smart plant |
| *Persicaria decipiens* | Pink Smart plant |

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|---|---|
| *Persicaria hydropiper* | Water pepper |
| *Persicaria lapathifolia* | Pale knotplant |
| *Persicaria orientalis* | Princes feather |
| *Persicaria prostrata* | Creeping smart plant |
| *Persicaria spp.* | Knotweed |
| *Persicaria subsessilis* | Hairy Smart plant |
| *Philydrum lanuginosum* | Frogsmouth |
| *Phragmites australis* | Common reed |
| *Phyla nodiflora* | Lippia |
| *Potamogeton crispus* | Curly pond plant |
| *Potamogeton javnicus* | Pond plant |
| *Potamogeton ochreatus* | Blunt pond plant |
| *Potamogeton tricarinatus* | Floating pond plant |
| *Ruppia maritima* | Sea tassel |
| *Salicornia quinqueflora* | Samphire |
| *Schoenoplectus mucronatus* | Three cornered club rush |
| *Schoenoplectus spp.* | Rush |
| *Schoenoplectus tabernaemontani* | Club rush |
| *Schoenoplectus validus* | River club rush |
| *Spirodela sp.* | Duck weed |
| *Triglochin procerum* | Water ribbons |
| *Typha sp.* | Cumbungi |
| *Utricularia gibba* | Yellow bladderwort |
| *Vallisneria nana* | Ribbon plant |

# SC6.7 Appendix 2: Salinity tolerant species

| BOTANICAL NAME | COMMON NAME | SALT TOLERANCE | COMMENTS |
|---|---|---|---|
| **Aquatic** | | | |
| *Bolboschoenus fluviatilis* | Marsh Clubrush | | |
| *Phragmites australis* | Common reed | | |
| *Typha orientalis* | *Bull rush* | | |
| **Semi aquatic** | | | |
| *Alternanthera denticulata* | Lesser joyweed | | |
| *Bolboschoenus caldwellii* | A rush | | |
| *Carex appressa* | Tall sedge | | |
| *Eleocharis cylindrostachys* | Boeckeler | | |
| *Eleocharis dietrichiana* | | | |
| *Eleocharis gracilis* | Slender spike rush | | |
| *Goodenia paniculata* | Swamp goodenia | | |
| *Juncus kraussii* | Sea rush | | |
| *Juncus usitatus* | Common rush | | |
| *Paspalum distichum* | Salt-water Couch | | Grass that tolerates severely saline soils |
| *Sporobolus viginicus* | Sand Couch, Salt-grass | Extremely saline [1] | Grass that tolerates severely saline soils |
| **Herbs and Grasses** | | | |
| *Brunoniella australis* | Blue trumpet | | |
| *Centella asiatica* | Gotu kola | | |
| *Commelina cyanea* | Scurvy weed | | |
| *Cynodon dactylon* | Common Couch | Highly saline [2] | Grass for highly saline soils |
| *Danthonia spp.* | Wallaby grass | | |
| *Einadia hastata* | Berry saltbush | | |
| *Lomandra longifolia* | Mat rush | Extremely Saline [2] | |
| *Paspalum distichum* | Salt-water couch | Extremely Saline [2] | |
| *Sporobolus virginicus* | Marine couch | Extremely Saline [2] | |
| *Stenotaphrum secundatum* | Buffalo grass | | |
| *Themeda australis* | Kangaroo grass | | |
| **Trees and Shrubs** | | | |
| *Acacia salicina* | Native wattle | | Suitability for saline discharge sites |
| *Acacia stenophylla* | Shoestring acacia | | Suitability for saline discharge sites |
| *Atriplex spp* | Saltbush | | Suitability for saline discharge sites |
| *Allocasuarina torulosa* | Forest she-oak | | |
| *Allocasuarina inophloia* | Woolly barked she-oak | | |

| | | | |
|---|---|---|---|
| *Allocasuarina littoralis* | Black she-oak | Slightly saline [1] | Drier areas (i.e. adjacent to drainage channel) |
| *Allocasuarina torulosa* | Forest oak | Slightly saline [1] | Drier sites |
| *Angophora floribunda* | Rough-barked Apple | | |
| *Angophora subvelutina* | Broad-leaved Apple | | |
| *Atriplex semibaccata* | Half-berried salt bush | Extremely Saline [1] | This species may be an indicator of saline soils. |
| *Atriplex cinerea* | Gray Saltbush | Extremely Saline [1] | Not a native to the area |
| *Baeckea virgata* | Twiggy Heath Myrtle | | |
| *Bursaria spinosa* | Blackthorn | | This plant is very tough and vandal proof (Spiky) |
| *Callistemon montanus* | Mountain Bottlebrush | | Suitability for saline discharge sites |
| *Callistemon phoeniceus* | Bottlebrush | | Suitability for saline discharge sites |
| *Callistemon rigidus* | Stiff bottlebrush | | Suitability for saline discharge sites |
| *Casuarina cristata* | Belah | | Suitability for saline discharge sites |
| *Casuarina cunninghamiana* | River she-oak | High [2] | Adjacent to drainage channel, including banks if possible. *C. glauca* is more salt tolerant than *C cunninghamiana*. |
| *Casuarina equisetifolia var incana* | Coastal she-oak | Very Saline [1]<br>Moderate [2] | Suitability for saline discharge sites |
| *Casuarina glauca* | Swamp she-oak | Extremely saline [1]<br>Very High [2] | Suitability for saline discharge sites |
| *Chenopodium auricomum* | Queensland bluebush | | |
| *Corymbia maculata* | Spotted Gum | Slightly saline [1]<br>High [2] | |
| *Eucalyptus amplifolia* | Cabbage Gum | | |
| *Eucalytpus argophloia* | Queensland western white gum | | Suitability for saline discharge sites |
| *Eucalyptus bosistoana* | Coast Grey Box | | |
| *Eucalyptus brassiana* | Cape York red gum | | |
| *Eucalyptus camaldulensis* | River red gum | | Suitability for saline discharge sites |
| *Eucalyptus curtisii* | Plunkett mallee | | Suitability for saline discharge sites |
| *Eucalyptus elata* | River peppermint, River white gum | Slightly saline [1] | |
| *Eucalyptus longicornis* | Red morrel | | Suitability for saline discharge sites |
| *Eucalyptus microtheca* | Coolibah | | Suitability for saline discharge sites |
| *Eucalyptus moluccana* | Grey box | Moderate Saline [1]<br>High [2] | Suitability for saline discharge sites |
| *Eucalyptus sideroxylon* | Red Ironbark | Slightly saline [1]<br>High [2] | Suitability for saline discharge sites |

| | | | |
|---|---|---|---|
| *Eucalyptus tereticornis* | Forest Red Gum | Moderate saline [1]<br>High [2] | Suitability for saline discharge sites |
| *Leucopogon virgatus* | Common beard-heath | | |
| *Leptospermum polygalifolium* | Yellow tea tree | | Suitability for saline discharge sites |
| *Melaleuca armillaris* | Bracelet honey myrtle | Moderate saline [1]<br>Moderate [2] | |
| *Melaleuca bracteata* | Black tea tree | | Suitability for saline discharge sites |
| *Melaleuca decora* | White feather honeymyrtle | | |
| *Melaleuca decussata* | Cross-leaf honey-myrtle | | Suitability for saline discharge sites |
| *Melaleuca ericifolia* | Swamp paperbark | Moderate saline [1] | Very wet sites or moist slopes — clumping or suckering species |
| *Melaleuca leucadendra* | Weeping paperbark | | Suitability for saline discharge sites |
| *Melaleuca linariifolia* | Snow-in-summer | Moderate saline [1]<br>Moderate [2] | Suitability for saline discharge sites |
| *Melaleuca nodosa* | Ball honey myrtle | Moderate [2] | These plants will add variety as well as being able to tolerate some level of soil salinity. |
| *Melaleuca quinquenervia* | Broad-leafed paperbark | Moderate saline [1]<br>Moderate [2] | Small to medium tree that should tolerate some salt and will add to species diversity. |
| *Melaleuca styphelioides* | Prickly-leaved paperbark | Moderate saline [1] | |
| *Melaleuca thymifolia* | Thyme honey-myrtle | | Suitability for saline discharge sites |
| *Melia azedarach* | Chinaberry or White cedar | | Suitability for saline discharge sites |
| *Myoporum acuminatum* | Beach boobialla | | |
| *Myoporum ellipticum* | Coastal boobialla | | |
| *Myoporum montanum* | Water bush | | |
| *Myoporum parviflorum* | Creeping boobialla | | |
| *Senna coronilloides* | Brigalow senna | | |
| *Syzygium forte spp. forte* | White apple | | Suitability for saline discharge sites |

*Note—*

*[1] Refer to Western Australian Government's Salinity tolerance of plants for agriculture and revegetation http://www.agric.wa.gov.au/environment/salinity/measurement/Plant_salt_tolerance.htm where the following have been defined:*

*a. Extremely Saline - Ece > 16 dS/m;*
*b. Very Saline - Ece 8-16 dS/m;*
*c. Moderate Saline - Ece 4-8 dS/m;*
*d. Slightly Saline - Ece 2-4 dS/m.*

*[2] Refer to the Salinity Management Handbook Department of Natural Resources Queensland (1997).*

## SC6.7 Appendix 3: Preferred street tree species

| SPECIES | COMMON NAME | SUITABILITY | | | |
|---|---|---|---|---|---|
| | | VERGE PLANTING | ROUND-A-BOUT | MEDIAN PLANTING | UNDER POWER LINES |
| *Allocasuarina littoralis* | Black sheoak | | ✔ | ✔ | |
| *Allocasuarina torulosa* | Forest oak | | ✔ | ✔ | |
| *Backhousia citriodora* | Lemon Scented Ironwood | ✔ | | | |
| *Banksia integrifolia* | Coastal banksia | | ✔ | ✔ | |
| *Barklya syringifolia* | Crown of gold | | ✔ | ✔ | |
| *Brachychiton acerifolius* | Illawarra flame tree | ✔ | ✔ | ✔ | ✔ |
| *Backhousia citriodora* | Lemon scented myrtle | ✔ | | | ✔ |
| *Backhousia myrtifolia* | Cinnamon myrtle | ✔ | | | |
| *Buckinghamia celsissima* | Ivory curl flower | ✔ | ✔ | ✔ | ✔ |
| *Callistemon salignus* | Willow bottlebrush | ✔ | | | ✔ |
| *Callistemon viminalis* | Weeping bottlebrush | ✔ | | | ✔ |
| *Casuarina cunninghamina* | River she-oak | | ✔ | ✔ | |
| *Casuarina glauca* | Swamp oak | | ✔ | ✔ | |
| *Cupaniopsis anacardiodes* | Tuckeroo | ✔ | | | ✔ |
| *Elaeocarpus reticulatis* | Blueberry ash | | ✔ | ✔ | |
| *Elaeocarpus grandis* | Blue quandong | ✔ | | | |
| *Flindersia australis* | Crows ash | ✔ | ✔ | | |
| *Grevillea baileyana* | White Oak | ✔ | | | |
| *Grevillea banksii* | Banks Grevillea | ✔ | | | ✔ |
| *Grevillea robusta* | Silky oak | | ✔ | ✔ | |
| *Glochidion ferdinandii* | Cheese tree | ✔ | | | |
| *Harpullia pendula* | Tulipwood | ✔ | ✔ | | |
| *Lagerstroemia indica* | Crape myrtle | ✔ | | | ✔ |
| *Lepiderema pulchella* | Fine-leaved tuckeroo | ✔ | | | ✔ |
| *Lophostemon confertus* | Brush box | ✔ | ✔ | | |
| *Lophostemon suaveolens* | Swamp box | ✔ | | | |
| *Melaleuca leucadendra* | Weeping Paperbark | ✔ | | | |
| *Melaleuca quinquenervia* | Broad Leaved Paperbark | ✔ | | | |
| *Melicope elleryana* | Pink doughwood | ✔ | | | |
| *Neolitsea dealbata* | White bolly gum | ✔ | | | |
| *Notelaea longifolia* | Long-leaved mock olive | ✔ | | | |
| *Podocarpus elatus* | Plum pine | ✔ | ✔ | ✔ | |

| | | | | | |
|---|---|---|---|---|---|
| *Pullea stutzeri* | Hard alder | | ✔ | ✔ | |
| *Rhodomyrtus psidioides* | Native guava | | ✔ | ✔ | |
| *Stenocarpus sinuatus* | Firewheel tree | ✔ | ✔ | ✔ | |
| *Syzygium francisii* | Giant water gum | ✔ | | | ✔ |
| *Syzygium leuhmanii* | Small-leaved lilly pilly | ✔ | | | ✔ |
| *Tristaniopsis laurina* | Water gum | ✔ | | | |
| *Waterhousea floribunda* | Weeping Lilly Pilly | ✔ | | | |
| *Xanthostemon chrysanthus* | Golden penda | ✔ | | | ✔ |

# SC6.7 Appendix 4: Town Streetscaping

## SC6.7.10 Gatton and Plainland streetscaping

| SCIENTIFIC NAME | COMMON NAME |
|---|---|
| **Trees** | |
| *Atalaya salicifolia* | Scrub whitewood |
| *Backhousia citriodora* | Lemon-scented myrtle |
| *Brachichyton populneus* | Kurrajong |
| *Buckinghamia celsissima* | Ivory Curl |
| *Cupaniopsis anacardioides* | Tuckeroo |
| *Flindersia australis* | Crows ash |
| *Harpullia pendula* | Tulipwood |
| *Lophostemon suaveolens* | Swamp box |
| *Melaleuca salignus* | White bottle brush |
| *Pittosporum undulatum* | Sweet Pittosporum |
| *Waterhousea floribunda* | Weeping lilly pilly |
| **Grasses or Groundcovers** | |
| *Callistemon sp.* | 'Little John' |
| *Coleus alloplectus* | Narrow leaved coleus |
| *Coleus australis* | Small flowered coleus |
| *Coleus suaveolens* | Sticky leaved coleus |
| *Crinum pedunculatum* | Brisbane River Lily |
| *Dianella brevipedunculata* | Bent leaf flax lily |
| *Dianella caerulea* | Blue Flax Lily |
| *Lomandra hystrix* | Creek mat rush |
| *Lomandra longifolia* | Spiky Matt Rush |
| *Turraea pubescens* | Native Witchhazel |
| *Zieria cytisoides* | Downy zieria |

## SC6.7.11 Helidon Streetscaping

| SCIENTIFIC NAME | COMMON NAME |
|---|---|
| **Trees** | |
| *Acacia maidenii* | Maidens wattle |
| *Acmena smithii* | Creek lilly pilly |
| *Allocasuarina littoralis* | Black she-oak |
| *Brachychiton rupestris* | Queensland Bottle Tree |
| *Hibiscus heterophyllus* | Native hibiscus |
| *Melaleuca linariifolia* | Narrow-leaved paperbark |
| *Myrsine variabilis* | Muttonwood |
| *Pipturus argenteus* | Native mulberry |

| | |
|---|---|
| **Shrubs to 5m** | |
| *Leptospermum Crimson Cascade* | Tea tree |
| *Leptospermum Pink Cascade* | Tea tree |
| *Leptospermum poligalifolium* | Tantoon |
| **Grasses or Groundcovers** | |
| *Grevillea Misty Pink* | Grevillea Misty Pink |
| *Hardenbergia violacea 'Meema'* | Hardenbergia Meema |
| *Hymenocallis littoralis* | Spider Lilly |
| *Lomandra longifolia'* | Spiny Matt Rush |
| *Melaleuca thymifolia* | Melaleuca Little Beauty |
| *Scaevola aemula* | Fairy fan flower |
| *Tulbaghia violecea* | Society Garlic |
| *Turraea pubescens* | Native Witchhazel |
| *Westringia 'Jarvis Gem'* | Rosemary |
| *Zieria cytisoides* | Downy zieria |

## SC6.7.12 Laidley Streetscaping

| SCIENTIFIC NAME | COMMON NAME |
|---|---|
| **Trees** | |
| *Acacia falcata* | Falcate wattle |
| *Brachychiton rupestris* | Queensland Bottle Tree |
| *Buckinghamia celsissima* | Ivory Curl |
| *Croton insularis* | Silver Croton |
| *Cyclophyllum coprosmoides* | Coastal Canthium; Coastal coffee |
| *Elaeocarpus reticulatus* | Blueberry Ash |
| *Melaleuca linariifolia* | Narrow-leaved paperbark |
| *Melia azedarach* | White Cedar |
| *Polyscias elegans* | Celery wood |
| **Shrubs to 5m** | |
| *Leptospermum Crimson Cascade* | Tea tree |
| *Leptospermum Pink Cascade* | Tea tree |
| *Leptospermum poligalifolium* | Tantoon |
| **Grasses or Groundcovers** | |
| *Dianella brevipedunculata* | Bent leaf flax lily |
| *Dianella caerulea* | Blue Flax Lily |
| *Grevillea 'Bronze Rambler'* | Prostate Grevillea |
| *Grevillea 'Poorinda Royal Mantle'* | Prostate Grevillea |
| *Leptospermum Crimson Cascade* | Tea tree |
| *Leptospermum Pink Cascade* | Tea tree |
| *Lomandra longifolia* | Spiky Matt Rush |
| *Turraea pubescens* | Native Witchhazel |

## SC6.7.13 Withcott Streetscaping

| SCIENTIFIC NAME | COMMON NAME |
|---|---|
| **Trees** | |
| *Allocasuarina torulosa* | Forest Oak |
| *Alphitonia excelsa* | Soap Tree |
| *Backhousia citriodora* | Lemon-scented myrtle |
| *Brachychiton rupestris* | Narrow-leaved bottle tree |
| *Buckinghamia celsissima* | Ivory Curl |
| *Melaleuca linariifolia* | Narrow-leaved paperbark |
| *Pittosporum undulatum* | Sweet Pittosporum |
| *Psydrax odorata* | Sweet suzie |
| *Syzygium luehmannii* | Small Leaf Lilly Pilly |
| **Shrubs to 5m** | |
| *Leptospermum petersonii* | Lemon Scented Tea Tree |
| *Leptospermim polygalifolium* | Tantoon |
| *Myoporum acuminatum* | Boobialla |
| **Grasses or Groundcovers** | |
| *Callistemon 'Little John'* | Callistemon Little John |
| *Crinum pedunculatum* | Brisbane River Lily |
| *Dianella caerulea* | Blue Flax Lily |
| *Grevillea 'Ivory Whip'* | Grevillea 'Ivory Whip' |
| *Grevillea 'Kay Williams'* | Grevillea 'Kay Williams' |
| *Grevillea 'Misty Pink'* | Grevillea 'Misty Pink' |
| *Grevillea juniperina 'Molongolo'* | Grevillea 'Molonglo' |
| *Hardenbergia violacea 'Meema'* | Hardenbergia Meema |
| *Leptospermum petersonii* | Lemon Scented Tea Tree |
| *Lomandra longifolia* | Spiky Matt Rush |
| *Scaevola aemula* | Blue Ribbon |
| *Turraea pubescens* | Native Witchhazel |
| *Westringia fruticosa* | Coastal Rosemary |

## SC6.7.14 Forest Hill Streetscaping

| SCIENTIFIC NAME | COMMON NAME |
|---|---|
| **Trees** | |
| *Araucaria cunninghamii* | Hoop Pine |
| *Backhousia citriodora* | Lemon-scented myrtle |
| *Brachychiton discolor* | Lacebark tree |
| *Buckinghamia celsissima* | Ivory Curl |
| *Cupaniopsis anacardioides* | Tuckeroo |
| *Harpulia pendula* | Tulipwood |
| *Hibiscus heterophyllus* | Native hibiscus |

| | |
|---|---|
| *Myrsine variabilis* | Muttonwood |
| *Pittosporum undulatum* | Sweet Pittosporum |
| *Stenocarpus sinuatus* | Firewheel Tree |
| **Shrubs to 5m** | |
| *Leptospermum polygalifolium* | Tantoon |
| *Myoporum acuminatum* | Waterbush |
| *Olearia elliptica* | Scrub daisy |
| **Grasses or Groundcovers** | |
| *Callistemon sp.* | Little John |
| *Crinum pedunculatum* | Brisbane River Lily |
| *Dianella caerulea* | Blue Flax Lily |
| *Hardenbergia violacea 'Meema'* | Hardenbergia Meema |
| *Lomandra longifolia* | Spiky Matt Rush |
| *Myoporum acuminatum* | Waterbush |
| *Olearia elliptica* | Scrub daisy |
| *Turraea pubescens* | Native Witchhazel |
| *Westringia 'Jarvis Gem'* | Rosemary |

# SC6.7 Appendix 5: Screen landscaping plant species

| SCIENTIFIC NAME | COMMON NAME | PLANTING INTERVALS |
|---|---|---|
| **Pioneer species (tree planting)** | | |
| *Acacia blakei subsp. diphylla* | Gorge wattle | Every 3m |
| *Acacia disparrima* | Hickory wattle | |
| *Acacia maidenii* | Maidens wattle | |
| *Acacia salicina* | Sally wattle | |
| **Shrub species** | | |
| *Melaleuca alternifolia* | Snow in summer | Every 5m to infill gaps between tree planting |
| *Melaleuca formosa* | Cliff bottlebrush | |
| *Melaleuca irbyana* | Swamp tea tree | |
| *Melaleuca quinquenervia* | Broad leaved paperbark | |
| *Melaleuca sieberi* | Small leaved paperbark | |
| *Melaleuca stypheliodes* | Prickly paperbark | |
| *Melaleuca viminalis* | Weeping bottlebrush | |
| *Harpullia pendula* | Tulipwood | |
| *Leptospermum polygalifolium* | Tantoon | |
| **Groundcover species** | | |
| *Dianella brevipedunculata* | Bent leaved flax lily | Every 1m |
| *Dianella caerulea* | Blue flax lily | |
| *Eremophila debilis* | Winter berry | |
| *Hardenbergia violacea* | False Sarsaparilla | |
| *Lomandra hystrix* | Creek mat rush | |
| *Lomandra longifolia* | Creek mat rush | |
| *Myoporum acuminaltum (prostrate form)* | Creeping boobialla | |
| **Low density screen landscaping tree planting** | | |
| *Glochidion ferdinandi* | Cheese Tree | Every 4m<br><br>*Note—High density planting species can also be used in the low-density planting area.* |
| *Jagera pseudorhus* | Foam Bark | |
| *Melaleuca salicina* | Willow bottlebrush | |
| *Melaleuca viminalis* | Weeping Bottlebrush | |
| **High density screen landscaping tree planting** | | |
| *Acmena smithii* | Creek lilly pilly | Every 3m |
| *Allocasuarina torulosa* | Forest she-oak | |
| *Allocasuarina littoralis* | Black she-oak | |
| *Casuarina cristata* | Belah | |
| *Melaleuca bracteata* | Black tea trea | |
| *Syzygium australe* | Creek cherry | |
| *Hymenosporum flavum* | Native frangipani | |

## SC6.7 Appendix 6: Undesirable plant species

| SCIENTIFIC NAME | COMMON NAME | FORM | REASON FOR UNDESIRABILITY |
|---|---|---|---|
| *Allamanda spp.* | Allamanda | Shrub | Poisonous:<br>Unsuitable for parks |
| *Alocasia brisbanensis (macrorrhiza)* | Cunjevoi | Shrub | Poisonous:<br>Unsuitable for parks |
| *Araucaria bidwilli* | Bunya pine | Tree | Large nuts fall:<br>Unsuitable for public areas and road reserves |
| *Aristolochia durior; or Aristolochia elegans; or Aristolochia macrophylla* | Dutchman's Pipe | Climbing vine | Poisonous:<br>Unsuitable for parks |
| *Banksia integrifolia* | Coastal banksia | Small tree | Shallow roots:<br>Unsuitable in or near subsurface disposal area |
| *Bougainvillea spp.* | Bougainvillea | Shrub | Unsuitable for parks and public areas |
| *Callistemon salignus* | White bottlebrush | Small tree | Shallow roots:<br>Unsuitable in or near subsurface disposal area |
| *Callistemon viminalis* | Weeping bottlebrush | Medium tree | Shallow roots:<br>Unsuitable in or near subsurface disposal area |
| *Casuarina cunninghamiana* | Creek she-oak | Large tree | Shallow roots:<br>Unsuitable in or near subsurface disposal area |
| *Casuarina glauca* | Swamp sheoak | Large tree | Shallow roots:<br>Unsuitable in or near subsurface disposal area |
| *Duranta spp.* | Golden dew drop; prickly duranta | Shrub | Poisonous:<br>Unsuitable for parks |
| *Ervatamia coronaria* | Crepe jasmine | Shrub | Poisonous:<br>Unsuitable for parks |
| *Eucalyptus intermedia* | Red bloodwood | Large tree | Shallow roots:<br>Unsuitable in or near subsurface disposal area |
| *Eucalyptus microcorys* | Tallowood | Large tree | Shallow roots:<br>Unsuitable in or near subsurface disposal area |
| *Eucalyptus robusta* | Swamp mahogany | Large tree | Shallow roots:<br>Unsuitable in or near subsurface disposal area |
| *Euphorbia spp.* | Poinsettia | Shrub | Poisonous:<br>Unsuitable for parks |
| *Ficus spp.* | Fig | Tree | Invasive root systems |
| *Glochidion ferdinandii* | Cheese tree | Medium tree | Shallow roots:<br>Unsuitable in or near subsurface disposal area |
| *Jagera pseudorhus* | Foam bark tree | Tree | Poisonous:<br>Unsuitable for parks |