



SINGLETON
COUNCIL

GUIDELINE

Building Over or Adjacent to Sewer Infrastructure

April 2018

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Background

Council is the responsible authority for the delivery of sewerage services to a large portion of homes and businesses across the Local Government Area. Council is committed to providing safe and effective collection and treatment of waste water at Council sewerage treatment plant, as well as ensuring the protection and longevity of Council's sewer assets.

Building over or adjacent to sewer by residents, commercial or industrial business' can be problematic for Council and the land owner, especially when sewer maintenance or repairs are required.

Council's first position is that structures not be constructed over sewers or within the sewers zone of influence. This guideline, and the overarching policy, addresses low risk commonly encountered situations nominating requirements for the construction of minor structures built over or near an easement or sewer, as well as associated vent(s) or maintenance structure(s) and guidance on larger structures.

Objective

The objective of the Building Over or Adjacent to Sewer Infrastructure Policy is to protect existing and future assets, both privately and corporately owned from potential damage. This policy also looks at allowing access for repairs, upgrades and inspection of Council assets and whom is subject to the associated costs.

Application

The Building Over or Adjacent to Sewer Infrastructure Policy applies to any development, which is built over or adjacent to the sewer infrastructure assets of Council.

Consideration of Building Over or Adjacent to Sewer Infrastructure Applications

Any application to Council to build adjacent/over sewer mains will only be considered if the alternative options outlined below are found to be not viable. Council approach to 'Build in the vicinity of Sewer' requests is as follows:

- Relocate proposed structure
- Relocate Utility's affected assets, or
- Provide protection measures and build over/adjacent to asset.

It is the developer's responsibility to investigate and document the above options, in consultation with Council. Some guidance regarding the above options is provided below.

Relocation of Structure or Assets

Relocation of Proposed Building

In all instances the first option considered should be the relocation of the proposed building away from the existing sewer assets. If this is not feasible due the position of the sewer main on the property adversely restricting the use of the land relocation of assets may be considered.

Relocation of Assets

Council will only consider relocation of existing sewer assets if the applicant can demonstrate that building away from the sewer adversely restricts the use of the land. Any relocation works need to ensure all required design standards (cover, grade, position) are still met and that the capacity or functionality of the assets is not reduced. All costs associated with the relocation of assets are to be funded by the developer/applicant.

Relocation of Gravity Mains

Where approval to relocate a sewer is granted the Developer, applicant or owner will be required to submit plans in accordance with Council design guidelines. Relocating the sewer following approval is required before construction of the proposed building/structure can commence. The applicant will need to liaise with Council regarding the bypassing of live sewage flows.

Relocation of Rising Mains

Where approval to relocate a rising main is granted the Developer, applicant or owner will be required to submit plans in accordance with Council design guidelines. Following approval, the applicant is required to relocate and ensure proper function of the rising main before construction of the building/structure can commence. The applicant will need to liaise with Council regarding the bypassing of live sewage flows.

Relocation of Asset Requiring Easements

The Developer, applicant or owner may be required to acquire or provide an easement in accordance with Council's requirements over a relocated gravity and or rising main.

Building over Sewer

Council will only consider a building or structure over the sewer main in exceptional circumstances and then only if the applicant can demonstrate that relocating the building or structure or relocation of the affected sewer infrastructure is not feasible.

The Developer /Applicant shall consider an integrated approach and demonstrate that all associated risks can be managed with marginal costs if building over a sewer main is to be considered and accepted by Council. All costs associated with the works are to be funded by the developer/applicant.



CCTV Inspection

Any application to build over a sewer must include the following:

- A CCTV inspection of the subject sewer, undertaken by a contractor qualified and with the necessary experience to do so, or by Council at the applicant's expense.
- The results of the CCTV inspection are to be submitted to Council with the application. The inspection may be used as a dilapidation survey, with the developer required to fully fund any repair work required to rectify damage caused by their development.

Results of the CCTV Inspection

Depending on the results of the CCTV inspection Council may require the Developer, applicant or owner to:

- Reconstruct the sewer main in its existing location using construction materials as specified by Council and in accordance with requirements set down within Council Engineering Guidelines for Subdivision and Development and approved plans or;
- Reline the existing sewer main by the engagement of contractors qualified to undertake such work. The name of contractor and the relining technique to be utilised will be submitted to Council for approval prior to work commencing.
- All works on gravity sewer mains must be completed for the full extent between manholes.

Stormwater Flow Paths

Typically, existing sewers are located along overland drainage paths. If new buildings are proposed over existing sewers, then the Major overland flow path for the site and catchment should be considered to minimise the risk of flooding to existing and future properties.

An integrated approach of water, sewer and irrigation and drainage assets needs to be considered simultaneously.

Category of Structures

The developments associated with the Building Over or Adjacent to Buried Sewer Infrastructure Policy can be categorised into the following three structure types:

- Category One - Heavy or Permanent Structures,
- Category Two - Light Weight or Demountable Structures, and
- Category Three - Miscellaneous Structures.

Category One - Heavy or Permanent Structures

These structures are typically constructed from masonry, brick, steel, timber and concrete and it is neither reasonable nor practical to remove or dismantle the structure for the purpose of carrying out sewer repairs or refurbishment. Examples of structures in this category include:

- Houses
- Factories
- Warehouses
- Brick Garages / Workshops
- Structures that are permanently habitable or used as a work place.
- In-Ground Swimming Pools

If heavy or permanent structures are to be built in the vicinity of sewers, the requirements for protection of and access to the existing sewerage network in the following sections must be followed.

Category Two - Lightweight or Demountable Structures

These structures are typically of a type of construction that would make it reasonable to remove / dismantle and re-erect if access to the main, by excavation, was required. Examples of structures in this category include:

- Pergolas
- Garden sheds
- Above ground pools (restrictions apply)
- Carports
- Timber / fibro / aluminium garages
- Glass houses / ferneries
- Barbecue facilities

These structures must be readily removable in the case of work required to take place on Council assets. Asset protection measures as outlined in the section below [Asset Protection Measures](#), may still apply to certain structures within this category.

Any future costs arising from the requirement to remove and subsequently reassemble these structures, as directed by Council, will be at the full cost of the owner.



Category Three - Miscellaneous Structures

Structures in this Category do not normally require protection of the sewer mains. Structures in this Category include:

- Fences
- Driveways (concrete, asphalt, pavers etc)
- Tarmac areas

As long as minimum depth requirements for sewer main have been met, no special protection measures for the sewer main should be required. However, if uncertainty exists in cases of anticipated high loadings or where sewer mains are less than minimum depth advice shall be sought from Council.

Any special conditions applied to miscellaneous structures would be on a case-by-case basis and would include in part a stipulation that any removal and reinstatement of the structures (involved with Council accessing the sewer main) would be at the cost of the owner. Provisions required for access to the existing sewerage network still apply.

Swimming Pools and Retaining are discussed in a later section of this guideline; Requirements for Specific Structure Types.

Construction Not Permitted

Structures will not be permitted to be built over and/or in close proximity to the following:

- Sewer rising mains, surcharge mains and critical gravity mains (generally all sewer mains of greater diameter than 300mm mains and/or deemed to be excessively deep ie. greater than 3.0m), as determined by Council.
- Any gravity sewer that, in the opinion of the utility, is in a poor condition. Exposing of the sewer, and/or CCTV may be required prior to construction. This inspection may determine that repair/replacement may be required. Any subsequent repair/replacement work will be at the developers cost.
- Sewer manholes, lampholes, maintenance points and junctions where sufficient clearances cannot be achieved. (See section on Clearances)
- No building within Council easements.

Asset Protection Measures

Where construction of any Category 1 or 2 structures will impose a load within an existing sewer assets zone of influence, Council may request the developer to carry out any combination of the following protection measures:

- Concrete encasement



- Piering of foundations

The protection measures may also be required due to other factors affecting the asset such as available cover.

Concrete Encasement

Concrete encasement of the sewer main may be requested for the protection sewer mains due to additional loads imposed by the works. Concrete encasement may also be requested if Council minimum cover requirements cannot be met.

Any concrete encasement is to comply with the WSAA Standard Drawing (SEW 1205) and the following specification:

- Only rubber ring jointed vitrified clay and PVC pipes may be encased in concrete. Permission may also be given to replace other types of pipes with PVC pipes prior to encasement depending upon the location and criticality of the lines.
- In trenches of material other than rock, encasing is to extend 150mm under, on both sides and on top of the pipe barrel. For trenches in rock, encasing is to extend 100mm under the pipe barrel, 150mm on top of the pipe barrel and for the full width of the excavated trench.
- Unless otherwise specified, all flexible pipe joints are to be maintained. The minimum length of the encasement will be the total length of the sewer that is affected plus a minimum of 1.0m on the each side plus any additional length to ensure encasement starts and finishes at a flexible joint. (Subject to soil conditions and depth of sewer this length may increase)
- If a manhole is less than 2.0m from the end of encasement, as required above, the encasement is to be extended up to the second flexible joint from that manhole.
- Backfilling of the trench with suitable material as per specification must not commence until at least 48 hours after placing the concrete.
- Concrete encasement shall not be poured integral with any other foundation or structure. Concrete should be minimum class N20 or N25 where a reinforced concrete design is required.
- Sewer junctions that are permitted to be incorporated in proposed concrete encasement are to be upgraded to a rubber ring jointed junction in order to maintain flexibility at the junction branch.
- Where the encasing of sewers in adjoining properties is required, written approval from the adjoining owner to enter the property to carry out the works will be required prior to approval being granted for works to commence.

All costs associated with concrete encasements are to be borne by the developer. Council works inspectors must be present when encasement work is being carried out.



Piering of Foundations

Piering of the proposed structures foundations may be requested to transfer loads outside an assets zone of influence. A certified design prepared by a suitably qualified and experienced Engineer will be required to accompany foundation designs. The plan shall show the design of all footings, beams and piers and clearly note required clearances, ground levels and nominated soil classifications,

The following requirements apply to foundation piering:

- The building and its foundations are to be designed in such a way that no building loads are transmitted to the utility's sewer and where possible, the pipe can be repaired or replaced at any time without affecting the stability of the building.
- Foundations within an assets zone of influence will require piering to a minimum depth of 150mm below the zone of influence of the affected asset or until solid rock is encountered.
- A minimum horizontal clearance of 1.0m is required between any piers and the face of a sewer main.

The use of displacement and screw pile construction methods will require approval by Council and may require additional clearances to existing assets as directed.

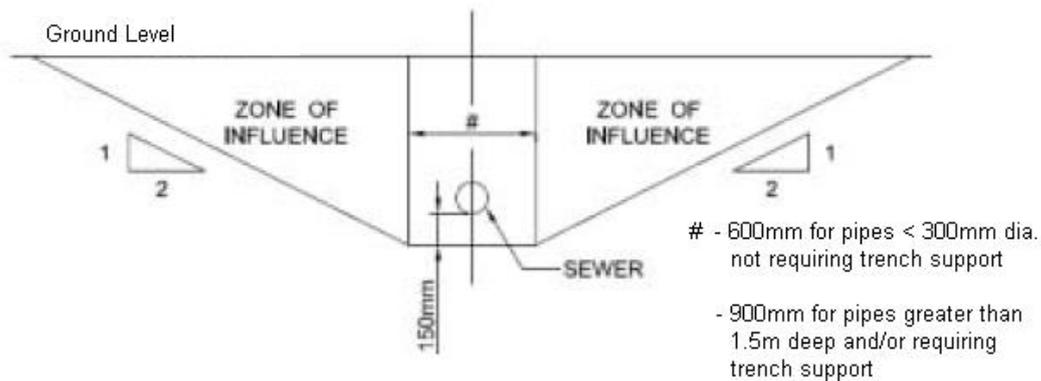
Zone of Influence

The Zone of Influence is an area extending both horizontally and longitudinally along the alignment of an underground asset. This area is considered as that part of the ground where:

- Settlement or disturbance of the ground surrounding the pipe may cause damage to buildings or structures on the surface above.
- Loads from buildings or structures on the surface may have an impact on the buried pipe.

The zone of influence shall be determined by extending a line at an angle of 2 (Horizontal): 1 (Vertical) to the surface, starting from a point 150mm below the invert of the sewer main and half of the trench width measured horizontally from the pipes centreline (See figure over page).

Figure 1 Zone of Influence



It is Council discretion whether to consider a steeper angle of repose (max 1H:1V) for stiff soils (clays etc). Geotechnical investigations and a report from a suitably qualified and experienced Geotechnical Engineer need to be provided by the applicant to support such requests.

Clearances from Access Structures

Any proposed structure shall not prevent future access to existing maintenance structures associated with sewerage assets. These include manholes, lampholes/maintenance shafts and sewer dead ends.

A minimum horizontal clearance of 1.5m is required around existing access structures as well as a minimum vertical clearance of 3.0m. The horizontal setback shall increase to 2.0m if two or more sides of an access structure are built around. The fourth side must be open and accessible at all times.

Access Requirements

Council requires that all sewer access structures be accessible at all times in case of maintenance or emergency situations.

Developments on properties with sewer manholes or lampholes must provide at least 900mm wide clear access to the sewer structures ie. along the boundary between fence and building.

This is necessary to allow Council staff access with their "tools of trade" such as cleaning rods and lid lifting equipment.

Developments which locate sewer manholes or lampholes in security areas must make suitable arrangements for access by Council sewer operations staff for maintenance or emergency work.



Existing Encumbrances

Where structures have been built over an underground pipeline without Council approval then Council may require that the structure be demolished, moved or substantially modified so that it complies with this policy.

Where it is necessary to access an underground line for maintenance or repair work Council will not be held liable for the cost of restoring any illegal structures and the property owner may be charged for extra work required due to the illegal structure.

Where a structure has been given permission, previously by Council, to be built over a pipeline then no further extensions, additions or reconstructions will be allowed without further assessment. Council recognises that the existing structure presents a risk to both the building and Council's liability. Therefore, Council will assess each structure on its own merit to give permission for additions.

Requirements for Specific Structure Types

Above Ground Swimming Pools

Above ground pools without floor decking around the pool, and not constructed of concrete or fibreglass, are considered to be semipermanent structures that are able to be removed on request to enable access to the sewer.

Special sewer protection provisions are not required for these pools provided that they are placed on the existing natural ground levels and minimum cover requirements to the sewer are met. Clearances to sewer access structures described above still apply. The owner should be advised that all costs associated with removal and reinstatement of the pool for access to the sewer main will be at the owner's cost.

Above ground pools with permanent decking are considered to be permanent structures and are subject to the conditions outlined in [In-ground Swimming Pools](#) section below.

In-ground Swimming Pools

Fibreglass pool

The following requirements apply to fibreglass pools:

- Minimum horizontal clearance from the pool to the face of sewer pipe of 1.5m
- If a fibreglass pool is constructed within the zone of influence of a sewer main it should be designed and certified as being self supporting with foundations founded below the zone of influence.
- No pool shall be located closer than 1.5m to any sewer maintenance structure (manholes etc).

Concrete pool

The following requirements apply to concrete pools:

- Minimum horizontal clearance from the pool to the face of sewer pipe of 1.0m.
- If the concrete pool is within the zone of influence of a sewer main, then the foundations of the pool shall be founded below the zone of influence (eg. piers) to ensure the pool is self supporting.
- No pool shall be located closer than 1.5m to a sewer maintenance structure (manholes etc).

Retaining walls

The construction of retaining walls is subject to the following requirements:

- Where the footings of a wall would encroach on the zone of influence the wall is to be designed in accordance with the [Asset Protection Measures](#) section of this document..
- Generally walls over 1.0m in height would not be permitted within 1.0m of the main.
- Minimum cover over the main is to be maintained or an Engineer's assessment is required for protection of the main.
- The wall is to be set back at a minimum of 1.5m from the centre of a sewer maintenance structures.
- A retaining wall less than 1.0m in height will be permitted over or within the zone of influence without the requirement for an Engineer's design provided that:
- the wall is at least 3.0m from an adjoining property or building/structure;
- The wall would not be subject to vehicle loadings.
- Any retaining wall crossing a sewer main must be supported over the main with a reinforced concrete foundation designed in accordance with the [Asset Protection Measures](#) section of this document to ensure no loads from the wall are transferred to the sewer main ie. bridging slab foundation.

Filling Over Sewer Mains

The allowable depth of fill that can be placed over a sewerage main depends on the material type and stiffness class of the existing pipe. Site filling that increases the depth to the main above 2.5m will require an application to Council and subsequent approval. Any application must include certification from suitably experienced qualified civil, structural or geotechnical engineer that:

- The loading imposed will not adversely affect the underlying sewer, or



- The remediation work proposed will prevent any adverse loading on the underlying sewer

The placing of fill to excessive depths over Council's main is not permitted (5.0m is a maximum depth for practical access) regardless of the structural capacity of the pipe. No fill is to be placed over sewer manholes and manholes are to be raised in conjunction with any site filling. Finished lid levels of maintenance structures, relative to ground level, will be advised by Council, based on the land use and prevalence of flooding.

Excavations Over and Adjacent To Mains

Excavations

Generally, excavations over or adjacent to a sewer main are not to reduce the earth cover over the main to less than the minimum limits as detailed in Council's Developer Specifications – Design and Construction – Sewerage Systems.

Any proposal to reduce cover over a sewer to less than the limits imposed in these guidelines will require an application to Council and subsequent approval. Any application must include, amongst other things, certification from a suitably experienced qualified civil, structural or geotechnical engineer that:

- The loading imposed will not adversely affect the underlying sewer, or
- The remediation work proposed will prevent any adverse loading on the underlying sewer

Earth Embankments

On sloping sites there is potential that earthworks down slope of an existing sewer main could present a risk for land slip or erosion of soil providing cover and/or side support to an existing sewer main.

Any proposed regrading of land immediately down slope of an existing sewer main should be designed with a slope no steeper than 3 (horizontal) to 1 (vertical) to ensure future erosion and/or land slip does not reduce cover and/or support to the existing sewer main. Steeper embankments would be permitted where the embankment is certified by a suitably experienced qualified civil, structural or geotechnical engineer and approved by Council.

Retaining walls may be required to provide support down slope of existing sewer mains if substantial regrading is proposed.

Abandoned Mains

Pressure or gravity mains which have been abandoned due to relocation to suit a particular development may remain in the ground providing the abandoned mains are capped to prevent the movement of water. Council may require certain abandoned

mains to be backfilled with grout depending on size, material type and proximity to other structures.

Alternatively, the abandoned mains are to be removed and the trench backfilled and compacted to at least 98% standard compaction. Note that WorkCover requirements will govern the handling of any Asbestos Cement materials.

Planting of trees

Tree roots can penetrate into sewerage pipes through joints or damaged sections of pipes, causing blockages and subsequent overflows. As a result, certain species are not recommended to be planted near sewer mains. A list of the highest risk species is provided in [Appendix 1 – Plants to Avoid near Sewer Mains](#).

Costs

The Developer, applicant or owner will be responsible for all costs associated with:

- All investigation and design and any costs associated with seeking approval
- If approval is granted then any construction costs
- Repairing any damage to a sewer main or associated sewer infrastructure caused by construction over or near an existing sewer.

If Council decides to upsize a sewer main subject to relocation by a developer, then a cost sharing arrangement may be agreed to between both parties that reflects the extra costs associated with installing a larger diameter main at the time of relocation by the developer. Note this may not apply where the upsizing of the pipe is required due to the subject development.

The Developer, applicant or owner will have no claim on Council for any costs incurred in the event that approval is not granted.

Definitions and Abbreviations

Term	Definition
Approved	Acceptable to, authorized by or approved by the Water Agency
Building Adjacent to Sewer	Where a structure is proposed to be built in the zone of influence but not over the sewer. The structure is likely to impact on Council sewers and associated structures.
Building Over Sewer	The erection of a structure over and within the zone of influence of the sewer.



CCTV	Closed Circuit Television
Easement to Drain Sewage	A legal entitlement placed over a parcel of land for the purpose of the provision, operation and maintenance of sewer infrastructure.
Encasement	The protection of a sewer pipe by encasing all around with concrete to Council standards.
Improvements	Are deemed to include but not be limited to pavements, shrubs, gardens, retaining walls, fences and all other structures.
Lamphole	A vertical pipe or shaft between manholes into which a light may be lowered for inspecting sewer.
Lightweight / Demountable Structures	Any approved structure that can at the owners risk and expense can be easily and readily dismantled and removed at the request of Council. Some examples are domestic carports, small tool or garden sheds.
Maintenance Shaft	Allows a sewer system to be inspected, cleaned and repaired from the surface.
Manhole	A covered hole, through which a person may access an underground or enclosed structure; such as the sewer.
Miscellaneous Structures	Any approved structure where no special protection measures for the sewer main should be required as long as the minimum clearance requirements have been met. Some examples are rainwater tanks, driveways or retaining walls.
Not Fully Enclosed	Where at least one side of the carport/verandah is completely open or two sides are partly open. Doors of any type are to be considered as closed sides
Over Flow Gully	A drain-like fitting located outside the home, that allows sewage to overflow away from the interior of the home and outside to the garden, in there is a sewer blockage.
Owner	The Agency, Authority, Board, Company, Controlling Authority, Corporation, Council, Department, Individual,

	Regulator, Utility or other legal entity who is the Owner or lessee of the property and/or who has responsibly for the property.
Pressure Sewer System	An overall system including the Pressure Sewer Unit, control panel, discharge pipe, boundary kit and pressure sewer pipes up to a discharge point in a conventional sewer.
PSS	Pressure Sewer System
Risk	The likelihood of a hazard causing harm in exposed populations in a specified time frame, including the magnitude of that harm.
Sewage	See Sewer
Sewer	An asset owned by Council used for the conveyancing of sewage, whether raw or treated. A sewer may be live or disused.
Sewer Line / Main / Pipe	An asset owned by Council, controlled and maintained by the Water and Sewer Group, used for the conveying of sewage (raw or treated). A sewer may be operational or disused.
Sewer System	The system of pipes and pump stations for collecting and transporting sewer from each property to the sewer treatment plant.
Sewer Treatment Plant (STP)	A facility for the treatment of sewer to remove pollutants (solid matter and pathogens) producing treated recycled water and bio-solids.
Stakeholders	Any person, company or relevant authority that can affect or be affected by the Council's actions objectives and policies.
Vent Shaft	Also known as a ventilation shaft or vent stack is a tall shaft designed for the safe release of gases built up in the sewers.



Waste Water	Waste water from toilets, sinks, showers and washing machines is carried through the sewer mains to be treated at the sewerage treatment plant.
Works	All those Works being sewers, maintenance structures, vents, pumping stations, pressure mains and accessories and shall include valve chambers and storage facilities as shown on the Design Drawings and includes any part or parts of the Works.
Yard Gully	A drain-like fitting located outside the home, designed to release any sewer overflow outside of the home in the event of a blockage in the sewer main.
Zone of Influence	<p>The 'zone of influence' of a sewer is that area of soil/strata that is likely to be influenced by building loads. Factors that determine the 'zone of influence' include trench width and depth and soil classification (by qualified structural engineer as per AS 2870) and Groundwater / level of the water table.</p> <p>The boundary of the 'zone of influence' coincides with the angle of repose of the strata encountered (including cut/fill). This boundary shall commence at the bottom corner of the trench nearest the proposed foundation. If the trench is partly in rock or shale the boundary shall commence at the top of the rock or shale strata. In heterogeneous soil the angle of repose may differ.</p> <p>The above criteria do not apply to water charged strata. Foundations in water charged ground are to be designed by a structural engineer and approved by Council.</p>

Related Documents

Related documents, listed below, are external documents directly related to or referenced from this document.

- Plumbing Code of Australia 2016
- Australian Standard AS/NZS 3500 – Plumbing and Drainage Set
- WSA 02-2002 Sewerage Code of Australia
- NSW Guidelines for Best Practice Management of Water Supply and Sewerage 2014
- Water Directorate – Building in the Vicinity of Sewer Mains Guidelines - 2013

Related documents, listed in the table below, are Council documents directly related to or referenced from this document.

Number	Title
POL/26013.2	Policy – Building Over Adjacent to Sewer Infrastructure
POL/26031.1	Policy – Sewer Supply Services
POL/26003.1	Developer Specification - Design and Construction – Sewerage Systems
16/68377	Developer Specification - Standard Drawing Set – Sewerage Systems



Appendix 1 – Plants to Avoid Near Sewer Mains

Botanical Name	Common Name	Damage Rating
Cinnamomum Camphora	Camphor Laurel	Extreme
Ficus Species	Fig Trees & Rubber Plants	Extreme
Populus Species	Poplars	Extreme
Salix Species	Willows	Extreme
Erythrina Species	Coral Trees	Very High
Eucalyptus Species	Large Gum Trees	Very High
Jacaranda Mimosifolia	Jacaranda	Very High
Liquidambar Styraciflua	Liquidambar	Very High
Araucaria Species	Norfolk Island & Bunya Pines	Very High
Brachychiton Acerifolium	Illawarra Flame Tree	Very High
Casuarina Species	Casuarinas	Very High
Melia Azedarach	Australian White Cedar	Very High
Pinus Species	Pine Trees	Very High
Platanus Acerifolia	Plane Tree	Very High
Schinus Molle	Pepper Tree	Very High
Ulmus Species	Elms	Very High
Bougainvillea Species	Bougainvilleas	High
Cortaderia Selloana	Pampas Grass	High
Grevillea Robusta	Silky Oak	High
Ilex Species	Hollies	High
Lagunaria Patersonii	Norfolk Island Hibiscus	High
Ligustrum Species	Privets	High
Magnolia Species	Magnolias	High
Nerium Oleander	Oleander	High
Phoenix Canariensis	Canary Island Date Palm	High
Phyllostachus Species	Bamboos	High
Toxicodendron Species	Rhus Trees	High
Lophostemon Confetus	Brush Box, Tristania	High
Wisteria Species	Wisteria	High

Document Control



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1.0	04/2018	Initial Draft	D.Tynan	K. Hardy	ELT

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