

DESIGN STANDARDS
for
URBAN INFRASTRUCTURE
10 PARKING AREAS



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10.1 Introduction

In new commercial developments, or as commercial areas are redeveloped, it is generally a development condition that parking be provided.

The parking should provide an adequate number of spaces for the proposed use of associated areas, be landscaped to an appropriate level to provide shade and screening for cars, provide a safe environment for users and meet the relevant Australian Standards.

10.2 Related codes of practice and guidelines

10.2.1 Industry standards

AS 1428.1 Design for Access and Mobility. Part 1: General Requirements for Access – New Building Work, Standards Australia.

AS 1428.2 Design for Access and Mobility. Part 2: Enhanced and Additional Requirements – Buildings and Facilities, Standards Australia.

AS 1428.4 Design for Access and Mobility. Part 4: Tactile Ground Surface Indicators for the Orientation of People with Vision Impairment, Standards Australia.

AS 2890.1 Parking Facilities. Part 1: Off-street Car Parking, Standards Australia.

AS 2890.2 Off-street Parking. Part 2: Commercial Vehicle Facilities, Standards Australia.

AS 2890.3 Parking Facilities. Part 3: Bicycle Parking Facilities, Standards Australia.

10.2.2 Policy and guidelines

ACT Crime Prevention and Urban Design Resource Manual, Planning and Land Management, ACT Department of Urban Services, Canberra, 2000.

ACT Parking and Vehicular Access Guidelines, Planning and Land Management, Department of Urban Services, Canberra, 2000.

Civic Accessibility Study Access Guidelines, Eric Martin and Associates, Able Access, Access Design Solutions for ACT Department of Urban Services, Canberra, 2001.

10.3 Car parks

10.3.1 General car park design principles

The layout and physical geometry of a car park is to be designed in accordance with Australian Standards AS 2890.1, AS 2890.2 and AS 2890.3.

The number of spaces provided is to be in accordance with the *ACT Parking and Vehicular Access Guidelines* unless stipulated otherwise in a Section Master Plan for site specific development conditions.

The car park layout is to be designed to be sympathetic with the landform and surrounding landscape.

Refer to the *ACT Parking and Vehicular Access Guidelines* for details of the provision for motorcycle parking.

The design of car park and facilities must take into account sewer mains and water pipes, easements and pipe protection rules. Consultation with ActewAGL is required to reference their pipe protection rules.

10.3.2 Safety

Car parks are to provide a safe environment for users. The design of the car park and surrounding landscape should provide clear sightlines into and throughout the car park.

Car parks should be provided with direct access via pedestrian paths to destinations and car parks should be provided with lighting where they will be used regularly during evenings (see Design Standard 12 Public Lighting). The design should minimise the probability of vehicle/vehicle conflict and vehicle/pedestrian conflict.

The *ACT Parking and Vehicular Access Guidelines* provides details of design issues to be considered to maximise community safety in car parks. The *ACT Crime Prevention and Urban Design Resource Manual* provides further information about designing for community safety and crime prevention.

10.3.3 Stormwater drainage

Underground drainage should be according to Design Standard 1 Stormwater after making allowance for water harvesting and other on site water re-use. It should be noted that it is illegal to connect stormwater from the car park to the sewer.

Sub-soil drainage should be provided for all trees and shrubs in planting areas in, or adjacent to car parks (see Design Standard 21 Irrigation). For this and aesthetic reasons, proposals should not include a large number of plantings in small islands or narrow strips. Design objectives can be better achieved in most situations through the use of fewer planting areas with a minimum width of 2.5 metres.

Any sumps in mulched areas must be set at soil level. However, they should be identifiable so that they can be found for cleaning.

Downpipes from roof gutters of adjacent buildings must be connected to the stormwater drainage system (see Design Standard 1 Stormwater) and should not drain into planted areas unless this is part of a water harvesting scheme and the overall drainage system is designed to accommodate this.

Water harvesting should be considered for trees and shrubs planted in car parks. The following are desirable features of any water harvesting scheme for trees or shrubs.

- The water running off from the car park pavement must reach sufficient area adjacent to the tree or shrub so that the water can soak into the subgrade and the tree roots are able to take advantage of the moist subgrade.
- The subsurface drainage (sub-soil drains) must be installed to ensure that the ground and adjacent car park pavement materials do not become water-logged and result in pavement failure.
- The area of the car park denied to cars because of water harvesting be minimised to ensure maximum utilisation from the investment in car parking.
- That maintenance costs be minimised by providing car park pavement of sufficient strength to support the imposed loads and a protection system to the trees so that they will not be hit by motor vehicles.

10.3.4 Wheel stops

Wheel stops are only to be allowed under special conditions where no other treatment is applicable. Wheel stops need to be constructed as a permanent kerb with allowance for vehicles to overhang a paved area that is additional to any pedestrian movement areas.

If wheel stops are used, arrangements which involve fixing of logs or kerbs to the pavement by spikes will not be approved as considerable damage can occur to vehicles when the wheel stops become dislodged under the vehicle.

10.3.5 Pavements

Sealed pavements should be used rather than gravel surfaces due to maintenance issues associated gravel surfaces.

Pervious pavements could be used as a means of water harvesting or stormwater run-off reduction. If adopted, subsoil drainage and pavement structure needs to be carefully considered to ensure the required car park design life will be achieved.

See Design Standard 6 Road Pavements

10.3.6 Signage and line marking

See Design Standard 9 Traffic Control Devices and the section on signs in Design Standard 19 Park and Street Furniture and Barbecues

Note; The use of raised ceramic markers to delimit parking bays is expressly forbidden.

10.3.7 Driveways

Driveway access to car parks is to be designed in accordance with the requirements of the Department Urban Services (see Design Standard 5 Driveways). The *ACT Parking and Vehicular Access Guidelines* provides details of design issues to be considered for car park driveways.

Where gravel surfaces are adopted within a carpark, all driveways from the road to the car park should be sealed.

10.4 Disabled parking

Provision of parking spaces for people with disabilities should conform to Australian Standard AS 2890.1. Access pathways and car parking gradients should meet Australian Standards AS 1428.1, AS 1428.2 and AS 1428.4. Within Civic, the *Civic Accessibility Study, Access Guidelines* should also be meet.

It is desirable that full width access ramps along the front of a disabled car park should be used.

10.5 Landscape elements for car parks

Car owners show a clear preference to park in the shade but the benefits of tree and shrub planting in carparks are not restricted to shade alone. Planting reduces the apparent size of the hard paving and ameliorates the visual impact of masses of multi-coloured cars or harsh expanses of pavements when car parks are empty.

Well-designed car parks, shaded by trees and screened by hedges, shrub beds or grassed mounds are a relief from stark expanses of paving. However, the integration of the landscape development with the design and construction of the car park is an essential requirement for both aesthetic and functional reasons. A minimum of 15 per cent of the car park area is to be landscaped with trees or shrubs.

The following design principles for incorporating trees and shrubs into car parks balance plant and human requirements.

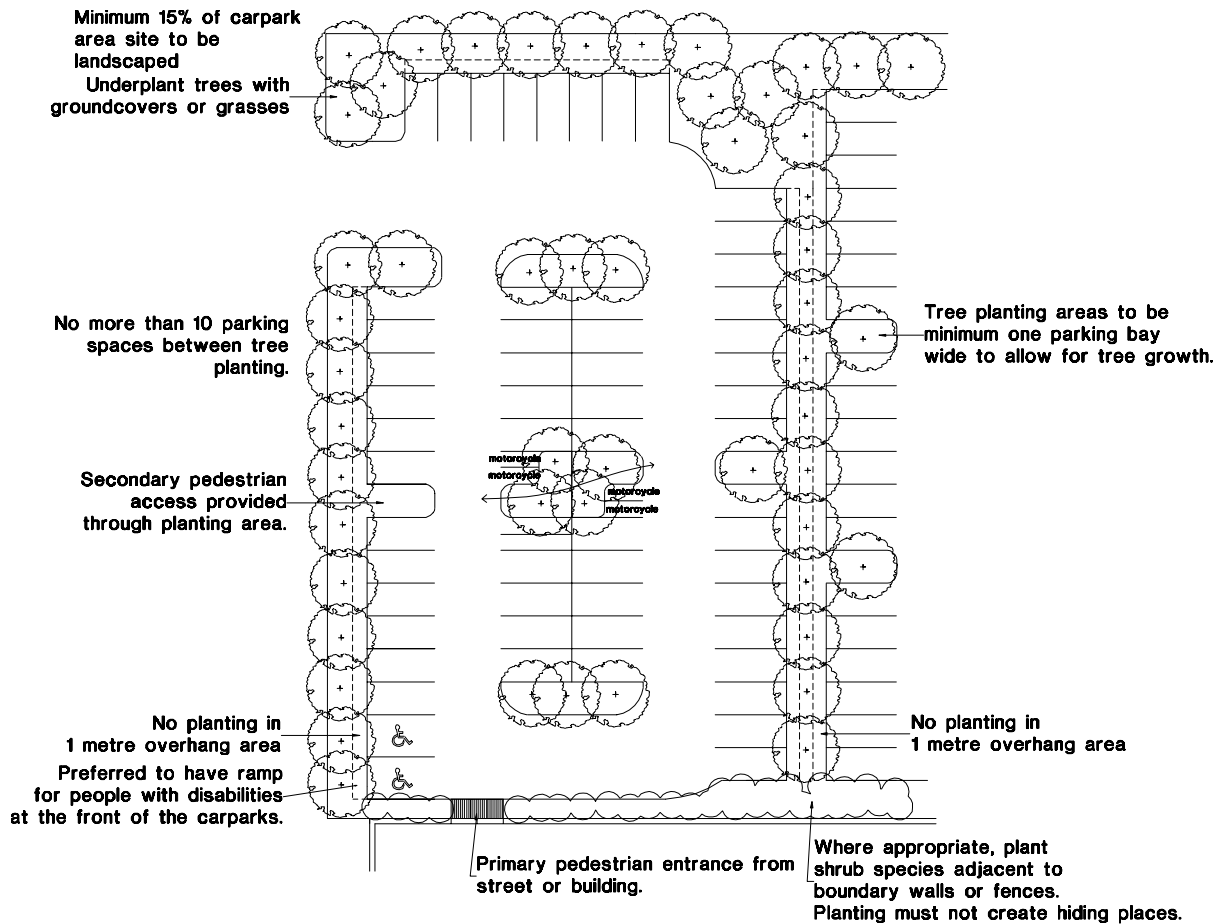
- Use groups of trees rather than individual specimens to improve conditions for the trees.
- Design for pedestrian movement around carparks that may include pedestrian paths through garden beds.
- Choose appropriate ground surfaces for the area around trees to maximise their access to water and air. These could be mulch, gravel, porous paving, groundcover plants and grasses.
- Consider using water harvesting to provide additional water to plants.
- Shrub beds within car parks may need to be restricted for safety and maintenance reasons but may be useful for screening on the edges of car parks. The need for modification of views of masses of cars from key viewing points does not necessarily imply the excessive use of shrubberies to achieve complete screening.
- Select plant species to achieve appropriate colour form and textural detail.
- Plants with thorns or berries are often not suitable for use in car parks.
- Shrubs and tree planting designs should be designed to require minimal or no pruning at maturity. In particular, shrub plantings should not overgrow paths or cause heavy shading of windows.
- Integrate services and other structural elements such as signs, posts, light poles, cycle parking and storage.
- Consider any landscape character policies for the area and the existing landscape character of the site.

The prime functions of car parking, access and pedestrian movement should be adequately supported by the design. The following points require specific attention.

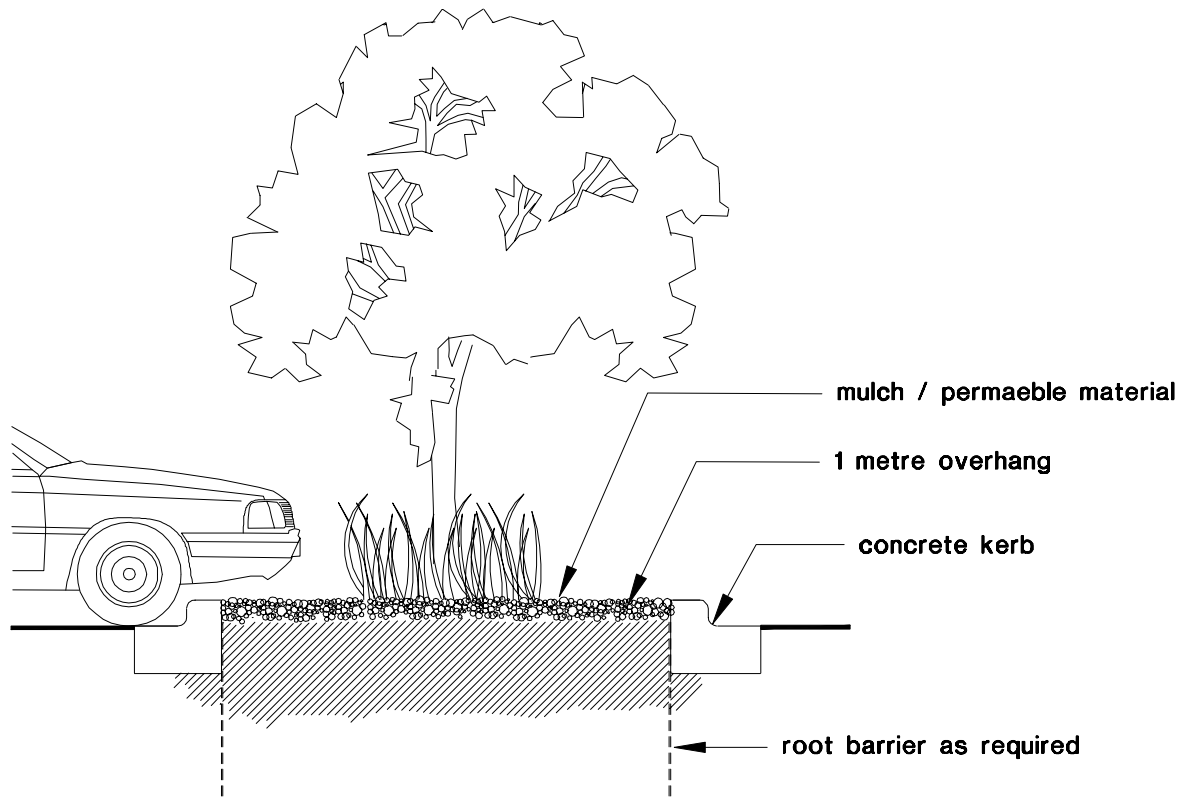
- Predicted pedestrian movement routes need careful assessment. The design must realistically accommodate these on either brick or concrete unit paving, stabilised granite gravel, concrete, bituminous concrete or some other form of hard pavement. The orientation of the aisle perpendicular to the building entrance or other pedestrian destination may overcome most of the pedestrian circulation issues.
- Access routes for disabled people to comply with AS1428.1 and include suitable surfaces.
- Landscape proposals should not increase the possibility of vehicle/ vehicle and vehicle/ pedestrian conflicts both within the car park, and at points of entry from roads.
- The design should not render it difficult for owners to find their car.
- Co-ordination between lighting design and tree planting is required to ensure that trees do not obscure lights, initially or at maturity.
- No tree or shrub planting should occur in areas where car overhang will occur. The normal car overhang allowance is 1 metre.

Vegetation should be protected using tree guards, fencing and other schemes for up to four years where the risk of vandalism and damage from vehicles is high.

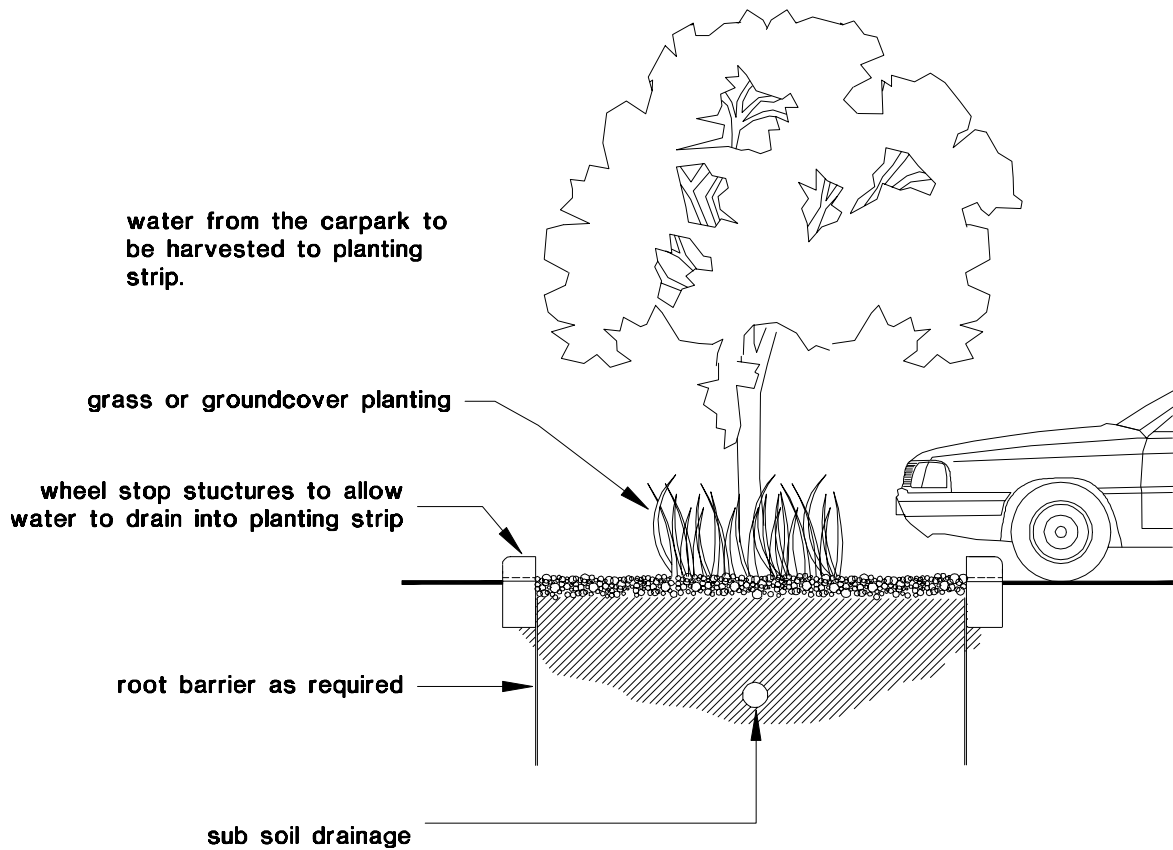
Paths and other hard surfacing in car parks should be carefully located to minimise the need for mowing edges. All edges of irrigated mown grass areas should be finished with a permanent mowing edge. See Design Standard 22 Soft Landscape Design for more information about edges.



Indicative car park layout



Typical section of a car park



Typical section of car park incorporating water harvesting.

10.6 Trees in car parks

Trees often perform poorly when planted in areas with hard surfaces, suffering stress from a poor growing medium, and lack of water and air. When trees do grow well there is often conflict due to roots damaging the surface. Providing more space and growing medium around the tree should reduce these problems.

Adequate air and water in the tree root zone can also be provided for in the design. For example, designing continuous islands between bays for mass planting, including an area of porous paving for a least 1 metre on all sides of the tree and a suitable growing medium to allow for air and water movement to the root zone and drainage away.

Structural soils allow water permeability and aeration to roots where in normal situations become impacted from pavement construction. Structural soil is made up of a load bearing stone lattice to support the pavement and soil. The voids between the lattice allows for air, water and root penetration. Soil partially fills these voids and is specified for its nutrient and water holding capacity. Plant functional requirements are: vigorous growth, longevity, minimal maintenance and ample shade. For plant selection see Design Standard 23 Plant Species for Urban Landscape Projects.

The design and location of underground services needs to be carefully co-ordinated with planting designs to ensure that services are not located within 2 metres of trees. See Design Standard 23 Plant Species for Urban Projects for recommended distances between particular tree species and footpaths and kerbs.

In the cases where small islands or strips less than 2.5 metres in width are used then protective kerbs, barriers or bollards must be used to protect areas that are subject to car overhang.

Trees that drop nuisance litter such as fruit, bark and sap or are likely to drop branches are not suitable for car parks.

In pedestrian areas, branches need to be pruned to 2000mm from ground level to ensure safe and easy access.

Where existing trees will be in paved areas, a minimum 2 metre diameter area of aggregate under a tree grate or other porous surface should be left to provide aeration and for fertilizing and watering. See Design Standard 22 Soft Landscape Design for more information about tree protection.

For irrigation requirements, refer to Design Standard 21 Irrigation.

10.7 Maintenance

The design of public car parks and associated landscape should aim to achieve minimum maintenance. The following points need particular attention.

- Signs, posts and barriers need to be carefully located and designed to ensure that minimal landscape maintenance is necessary.
- Areas proposed for mowable grass should not be steeper than 1:4.
- Granite gravel should not be used near entrances to buildings or on slopes greater than 1:30.

- The 1 metre car overhang areas should be surfaced with either compacted stabilised decomposed granite, concrete, no fines concrete, bituminous concrete or another hard or porous surface treatment as appropriate.
- Mulches should only to be used on slopes where the mulch will be stable.
- Dry grass areas adjacent to the car park should be protected from vehicles.

10.8 Further reading

Disability Discrimination Act 1992 (Cwlth).

Guide to Traffic Engineering Practice, Part 11 Parking, National Association of Australian State Road Authorities. 1988.

Guide to Traffic Generating Developments, Road and Traffic Authority, NSW, 1993.

Motor Traffic Act (NSW).

Proposed Policies for Residential Development in the ACT incorporating ACTCode, Urban Services, October 2000