Landscape Design and Installation Standards

This fact sheet is intended to assist applicants understand the City's minimum expectations relating to the design and installation of landscaping of public open space and streetscapes

This document has been produced to guide developers on the standard landscape specifications for streetscapes and public open space (POS). These guidelines have been created to ensure a standard approach is implemented across all new estates.

1. Design Phase Considerations

These specifications are to be read in conjunction with the City's Public Open Space Landscape Guidelines – in particular the landscape Design Considerations and Form, Function, Classification and Embellishment. In developing the design consider:

- The intended function of the park and associated level of embellishment
- Design for Health and Wellbeing
- Design for Access and Inclusion
- Sense of Place and existing trees
- Site Conditions and Analysis
- In development of the design the developer shall be aware that City accepts Practical Completion and handover of whole POS areas only (ie. the POS shall be kerbed on all sides). The submission of designs for POS shall meet this condition, showing the POS is fully kerbed at time of Practical Completion.

2. Site Works

- Prior to acceptance of site from the Civil Contractor, the landscape contractor shall review and confirm that the site is in order and that all sub-grade materials are suitable. Soil subgrade material may be either a locally available native soil or may be imported as fill material during the construction process, however all subgrade soil must conform to the soil classification A-S being a predominately free draining soil, free from organic matter and other deleterious matter, certified free from pests and diseases.
- Fill for garden beds shall be landscape or native mix depending on the planting proposed. Both mixes are to be AS4419 Certified and applied a minimum depth of 200mm for garden beds.
- Rootzone sand shall be installed for turf to a depth of 200mm for non-active turf and installed rootzone sand shall be AS4419 Certified. Refer to the City's standard oval design specification for active turf sites.
- Earth works and fine grading shall be undertaken as per the approved earthwork drawings and shall conform to the lines, grades, cross-sections and details shown on the Drawings. All organic matter such as stumps, roots, scrub and brush, and all other foreign material including concrete, masonry, boulders, fences, structures, slabs and rubbish, shall be cleared from the natural surface, prior to works progressing to landscape installation.

3. Hardworks

3.1 Transformer Sites

- At detailed design stage, prior to implementation, the landscape and civil drawing sets shall document the transformer location and associated details.
- Each transformer site will have its own design and requirements for fire considerations.
- The electrical consultant shall provide a detailed plan which shows the area which is required to have no combustible material. The City will require this area to be hard landscaped with gravel or concrete and vested as road reserve not POS. Turf will not be considered as an acceptable material.
- The remaining extent of restrictive covenant for fire separation area. Provided this portion of the restricted covenant does not limit the ability to landscape the POS, this will be accepted by the City, however this area will be calculated as 'restricted POS' not unrestricted within the POS calculations.

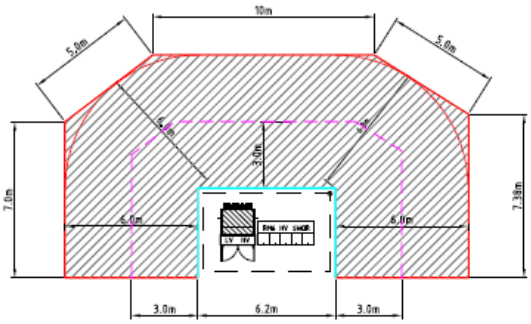

Image 1. Example transformer site.

Red line = Extent of restrictive covenant
Purple line = Extent of no combustible material

3.2 Pathways

- POS design to determine a primary access route (accessible path of travel) to all key elements of the site (and all accessible elements) that meets the Australian Standard requirements of a walkway (ideally) with gentle and compliant falls and a traversable surface.
- A minimum pathway width of 2200mm is recommended for the primary access routes. This is the minimum width requirement for a walkway that will also allow wheelchair movement, turning and passing for two wheelchairs (or prams and the like) [AS1428.1 2009 Clause 10.2]. Beyond the primary access route, secondary path routes may be considered suitable at a reduced width, ensuring minimum 1.5m width.
- All paved surfaces are to be graded to drain to turf and planting areas.
- Loose gravel pathways are not permitted to be installed in POS or streetscapes, except as feature paving in approved locations or as required for drainage purposes.
- Tactile Ground Surface Indicators (TGSI's) to be applied in accordance with **Section 3.5 Tactile Ground Surface Indicators (TGSI's),** within this document.
- Ideally the primary access route is constructed of a durable surface material (concrete) that will maintain a traversable surface and will not be subjected to erosion or loose material washing onto the surface (e.g. retained to the upper side) creating a slippery/unsafe surface.
- Ensure that the specified ground material is traversable by people who use a wheelchair and those with an ambulant or sensory disability. Poorly laid brick paving with even minimal changes in level and gaps could create a barrier / trip hazard, or at the least an inconvenience to some walking aids and / or manual wheelchairs. [AS1428.1 2009 Clause 7.1]

- Ensure that abutting surfaces along the accessible path of travel have vertical edges of not more than 3mm or 5mm (if the lip is bevelled or rounded). [AS1428.1 2009 Clause 7.2]
- Provide good colour contrast between the paths and edges will assist those with low vision to identify paths.
- Ensure that the specified flooring material have finishes that are slip resistant [Refer to Tables 3A and B of SA HB 198:2014]
- Any pathways accessible by maintenance vehicles shall be reinforced and a minimum of 150mm thick and conform to the City's minimum standard footpath detail, available on the City's website- https://www.armadale.wa.gov.au/standard-drawings.

3.3 Stairs

- Proposed materials to be used shall be durable and hard-wearing, suitable for exposure to outdoor conditions with low on-going maintenance costs. Blockwork walls shall be laterite rather than limestone.
- Tactile Ground Surface Indicators (TGSI's) to be applies in accordance with **Section 3.5 Tactile Ground Surface Indicators (TGSI's),** within this document.
- Check building licence requirements.
- Where stairs are proposed, stairs shall be constructed as follows [AS1428.1 2009 Clause 11.1]:
    a) Where the stair is at an intersection, the stair shall be set back by a minimum of 900mm so that the handrail termination and TGSIs do not protrude into the transverse path of travel.
    b) Stairs shall have opaque risers.
    c) Stair nosings shall not project beyond the face of the riser and the riser may be vertical or have a splay backwards up to a maximum 25mm. Stair nosing profiles shall:
        i. have a sharp intersection
        ii. be rounded up to 5mm radius
        iii. be chamfered up to 5mm × 5mm
    d) At the nosing, each tread shall have a strip not less than 50mm and not more than 75mm deep across the full width of the path of travel. The strip may be set back a maximum of 15mm from the front of the nosing. The strip shall have a minimum luminance contrast of 30% to the background.
    e) Where the luminance contrasting strip is not set back from the front of the nosing then any area of luminance contrast shall not extend down the riser more than 10mm.
- Stairway handrails shall be continuous throughout the stair flight and, where practicable, around landings and have no obstruction on or above up to a height of 600 mm and as follows [AS1428.1 2009 Clause 11.2]:
    a) The design and construction of handrails shall comply with AS1428.1 2009 Clause 12.
    b) Handrails shall be installed on both sides of the stairs.
    c) Handrails shall have no vertical sections and shall follow the angle of the stairway nosings.
    d) Where a handrail terminates at the bottom of a flight of stairs, the handrail shall extend at least.one tread depth parallel to the line of nosings plus minimum of 300 mm horizontally from the last riser.
    e) The handrail shall extend a minimum of 300 mm horizontally past the nosing on the top riser.
    f) Where the handrail is continuous, the 300 mm extension is not required in the inner handrail at intermediate landings.
    g) The dimensions indicating the heights of handrails shall be taken vertically from the nosing of the tread to the top of the handrail or from the landing to the top of the handrail.
- For stair warning TGSIs [AS1428.4.1 2009 Clause 2.4 Figures 2.2 & 2.3(A)]
- Ramps are preferred to stairs for equitable access or co-located with stairs as an inclusive approach to the provision of step-free vertical access in the public realm.

3.4 Ramps

- A continuous accessible path of travel shall not include a step, stairway, turnstile, escalator, moving walk or other impediment. [AS1428.1 2009 Clause 6.1]
- Tactile Ground Surface Indicators (TGSI's) to be applied in accordance with **Section 3.5 Tactile Ground Surface Indicators (TGSI's),** within this document.
- Walkways, ramps and landings that are provided on a continuous accessible path of travel shall be as follows [AS1428.1 2009 Clause 10.1]:
    a) Sharp transitions shall be provided between the planes of landings and ramps.
    b) Landings shall be provided at all changes in direction.
    c) Landing or circulation space shall be provided at every gate, or similar opening.
    d) For walkways and landings having gradients in the direction of travel shallower than 1:33, a camber or crossfall shall be provided for shedding of water and shall be no steeper than 1:40, except that bitumen surfaces shall have a camber or crossfall no steeper than 1:33.
- Walkways shall comply with the following [AS1428.1 2009 Clause 10.2]:
    a) The floor or ground surface abutting the sides of the walkway shall provide a firm and level surface of a different material to that of the walkway at the same level of the walkway, follow the grade of the walkway and extend horizontally for a minimum of 600 mm unless a kerb or kerb rail and handrail or a wall not less than 450mm in height.
    b) Walkways shall be provided with landings, as specified in Clause 10.8, at intervals not exceeding the following:
        i. For walkway gradients of 1:33, at intervals no greater than 25m
        ii. For walkway gradients of 1:20, at intervals no greater than 15m
        iii. For walkway gradients between 1:20 to 1:33, at intervals that shall be obtained by linear interpolation.
        iv. For walkways shallower than 1:33, no landings are required.
- Pedestrian ramps shall comply with the following [AS1428.1 2009 Clause 10.3]:
    a) The maximum gradient of a ramp exceeding 1900 mm in length shall be 1:14
    b) The gradient of a ramp shall be constant throughout its length.
    c) Ramps shall be provided with landings at the bottom and at the top of the ramp and at intervals not exceeding the following:
        v. For ramp gradients of 1:14, at intervals not greater than 9m.
        vi. For ramp gradients steeper than 1:20, at intervals not greater than 15m.
        vii. For ramp gradients between 1:14 and steeper than 1:20, at intervals that shall be obtained by linear interpolation.
    d) Where ramps are constructed with a change in direction, the angle of approach shall create a 90° angle to the line of transition between the ramp surface and the landing surface.
    e) Ramps shall have a handrail on each side of the ramp.
    f) Where the ramp is at an intersection, the ramp shall be set back by a minimum of 900mm so that the handrail and TGSIs do not protrude into the transverse path.
    g) The handrail shall extend a minimum of 300 mm horizontally past the transition point at the top and bottom of the ramp except where the inner handrail is continuous at an intermediate landing.
    h) Ramps and intermediate landings shall have kerbs or kerb rails on both sides.
- Curved ramps, walkways and landings shall comply with the following [AS1428.1 2009 Clause 10.4]:
    a) The gradient of curved ramps and walkways shall comply with AS1428.1 2009 Clause 10.4 Figure 20
    b) Landings shall comply with AS1428.1 2009 Clause 10.8
    c) The length of a curved ramp shall be measured horizontally along its centreline.
    d) Curved ramps and walkways shall have a width of not less than 1500mm.

e) Any crossfall shall be towards the centre of curvature.

- If required, the permissible threshold ramps at doorways on a continuous path of travel shall have [AS1428.1 2009 Clause 10.5]:
  a) a maximum rise of 35mm
  b) a maximum length of 280mm
  c) a maximum gradient of 1:8
  d) be located within 20 mm of the door leaf which it serves.
  e) where the exposed edges of the threshold ramp does not abut a wall, the edges shall be tapered or splayed at a minimum 45°.
- Step ramps shall have [AS1428.1 2009 Clause 10.6]:
  a) a maximum rise of 190mm
  b) a length not greater than 1900mm
  c) a gradient not steeper than 1:10
  d) a slip-resistant surface
  e) The edges of step ramp shall have a 45° splay where there is pedestrian cross-traffic. Otherwise, it shall be protected by a suitable barrier, such as:
     i. a wall or suitable barrier with a minimum height of 450mm
     ii. where an open balustrade is provided a kerb or kerb rail shall be provided
- Kerb ramps shall [AS1428.1 2009 Clause 10.7]:
  a) be aligned in the direction of travel.
  b) have the centreline, through the pedestrian refuges (if any), align across the road or vehicular way within the building/property allotment.
  c) be aligned at 90° to path of travel at the top and bottom of kerb ramps.
  d) have a sharp gradient transition at the top and bottom of kerb ramps.
  e) a maximum rise of 190mm.
  f) a length not greater than 1520mm.
  g) a gradient not steeper than 1:8.5, located within or attached to a kerb.
- For ramp warning TGSIs (walkways, threshold ramps and step ramps do not require TGSIs) [AS1428.4.1 2009 Clause 2.4 Figure 2.3(B)]

3.5 Tactile Ground Surface Indicators (TGSI's)

- TGSIs should be installed to provide guidance (for orientation and wayfinding via the application directional TGSIs) and/or warning of an obstruction or hazard in any location where insufficient alternative or 'natural' tactile cues exist.
- Along the continuous accessible path of travel, warning TGSIS shall be installed and placed as follows [AS1428.4.1 2009 Clause 2.3.3]: For the full width of the path of travel.
  a) Perpendicular to the direction of travel when approaching a hazard.
  b) Set back 300mm from the edge of the hazard.
  c) Where integrated warning TGSIs need to be detected by a person approaching at an angle to the continuous accessible path of travel, the TGSIs shall be arranged over a minimum depth of 600mm to 800mm from the direction of approach.
  d) Where discrete warning TGSIs are used over a depth of 300mm to 400mm, the arrangement shall be over a minimum depth of 600mm to 800mm from the direction of approach.
- Where there are ramps and stairs along the accessible path of travel, warning TGSIS shall be installed and placed as follows [AS1428.4.1 2009 Clause 2.4]:
  a) Located at both the top and bottom of stairways and ramps.

b) Where the distance of the midway landing is 3000mm or more to the nearest nosing edge, the warning TGSIs shall be over a distance of 600mm-800mm.
c) Where the distance of the midway landing is less than 3000mm to the nearest nosing edge, the warning TGSIs shall be over a distance of 300mm-400mm.
d) Where handrails are continuous on both sides of the midway landing and the distance of the landing is less than 3000mm to the nearest nosing edge, warning TGSIs are not required.

- Where there are impediments or hazards with less than 2000mm height clearance in an accessible open public space, contact with overhead hazard shall be prevented by a suitable barrier such as [AS1428.4.1 2009 Clause 2.6 Figure 2.6]:
  a) enclosing the area; or
  b) providing handrails with kerbs or kerb rails in accordance with AS1428.1
  c) In the absence of a suitable barrier, 600mm to 800mm deep band of TGSIs shall be installed at 300mm from the hazard.
- Where a pedestrian area adjoins a vehicular way at grade (on the same level, without a barrier kerb) or to delineate the pedestrian area and from the vehicular way, 600mm to 800mm deep band of warning TGSIs shall be installed 300mm away from the edge of the vehicular way. [AS1428.4.1 2009 Clause 2.5]
- Directional TGSIs are provided to [AS1428.4.1 2009 Clause 3.1]:
  a) give directional orientation in open spaces where there are insufficient tactile directional cues (e.g. handrails or walls).
  b) designate the route to be taken to avoid a hazard in the absence of existing tactile cues.
  c) give directional orientation where a person must deviate from the regular continuous accessible path of travel to have access to
     i. a mid-block kerb ramp or street crossing
     ii. public transport access point (e.g. bus, tram or light rail stop, train or light rail station or passenger ferry wharf)
     iii. point of entry to a significant public facility (e.g. railway station, public hospital, community health centre, sports or entertainment venue or public toilet)
- Directional TGSIs shall be installed and placed as follows [AS1428.4.1 2009 Clause 3.2.3]:
  a) parallel with and along the centreline of the required direction of travel.
  b) where indicating the continuous accessible path of travel, they shall be arranged according with a depth of 300mm to 400mm.
  c) where needed to be detected by a person approaching at an angle to the continuous accessible path of travel, the directional TGSIs shall be arranged over a minimum depth of 600 mm to 800 mm from the direction of approach.
- Where a continuous accessible path of travel denoted by directional TGSIs reaches a point for a change in direction, this point shall be indicated by warning indicators 600mm to 800mm × 600mm to 800mm. [AS1428.4.1 2009 Clause 3.3]
- Warning TGSIs shall be installed on the face of kerb ramps at pedestrian crossings in the following scenarios [AS1428.4.1 2009 Appendix C3]:
  a) the distance between the building line/boundary and the top of the kerb ramp is 3m or more.
  b) the change in gradient between that of the pedestrian surface at the top of the kerb ramp and the gradient of the kerb ramp surface is shallower than 1:8.5.
  c) the kerb ramp is not aligned with the building line and in not the direction of travel across the vehicular way. Directional indicators should lead to the warning indicators located at the crossing entry point. Directional indicators should be provided from the property line to the top of the ramp.
- TGSIs shall be laid so that there is no likelihood of the edges lifting. [AS1428.4.1 2009 Clauses 2.3.1 & 3.2.1]
- A TGSI shall be slip-resistant. Preference for concrete TGSI's.

- The base surface of an integrated TGSI shall be not more than 3mm above the abutment surface of the surrounding floor or ground surface and shall have all exposed external edges chamfered.
- Where extensions are required, ensure that the TGSIs have cut/seam lines in the middle section and all directional TGSIs have the chamfered sides to reduce tripping hazards.

3.6 Walls

- Proposed materials to be used shall be durable and hard-wearing, suitable for exposure to outdoor conditions with low on-going maintenance costs. Blockwork walls shall be laterite rather than limestone.
- A non-sacrificial anti-graffiti coating must be installed to exposed areas of walls.
- Check building licence (BL) requirements, a BL may be required for all walls over 500mm.
- Retaining walls shall have suitable drainage designed in.
- Retaining walls at a height of 600mm shall require a balustrade.
- Retaining walls under a height of 600mm with a pathway adjacent shall have a kerb or kerb rail.
- Kerbs or kerb rails shall [AS1428.1 2009 Clause 10]:
    a) be located so that the path-side face is either flush with the path-side face of the handrail or no greater than 100 mm away from the path-side face of the handrail, if a handrail is provided.
    b) where the handrail is supported on a vertical post, the height of the top of the kerb or kerb rail shall be not less than 150 mm above the finished floor.
    c) be a minimum of 65mm in height (kerb).
    d) be a minimum of 150mm in height with a maximum gap of 65mm in height (kerb rail).
    e) Where kerb is at a height of 65 mm to 75 mm, the support posts shall be set back a minimum of 200 mm from the face of the kerb or kerb rail.

3.7 Garden Bed Edging

- Extruded concrete kerbing is preferred as a garden bed edge. Garden bed kerbing is to be plain grey in colour, 32mpa at 28 days and installed utilising suitable extrusion kerbing equipment operated by a competent and qualified operator. The profiles will typically be either 150mm (w) x 200mm (d) or 150mm x 150mm.

3.8 Pedestrian Bridges and Boardwalks

- Utilise timber alternatives such as composite or concrete decking.
- Structural support shall be concrete piles, no metal or timber work below the 1:5 year, top of water level.
- Local hardwood timber will be considered within handrails and as a structural timber.
- If the depth of water beneath / adjacent to the bridge is over 300mm in depth, a balustrade is required to be provided.
- If the fall height is greater than 600mm high, a balustrade is required. If the drop is less than 600mm high, with water under 300mm, a kick rail will be accepted.
- Bridges over Water Corp easements / drains will be required to comply with above barrier / handrail / kickrail requirements.
- The design and construction of handrails shall comply with the following [AS1428.1 2009 Clause 12 Figure 29]:
    a) Handrails and balustrades shall not encroach into required circulation spaces.
    b) The cross-section of handrails shall be circular or elliptical, not less than 30mm or greater than 50mm in height or width for not less than 270° around the uppermost surface.

c) Exposed edges at ends and corners of handrails shall have a radius of not less than 5mm.
d) The top of handrails shall be not less than 865 mm nor more than 1000 mm above the nosing of stairway tread or the plane of the finished floor of the walkway, ramp or landing.
e) The height of the top of the handrail, measured, shall be consistent through the ramp (or stairs) and any landings.
f) If a balustrade is required at a height greater than the handrail, both shall be provided.
g) Handrails shall be securely fixed and rigid, and their ends shall be turned through a total of 180°, or to the ground, or returned fully to end post or wall face.
h) The clearance between a handrail and an adjacent wall surface or other obstruction shall be not less than 50 mm. This clearance shall extend above the top of the handrail by not less than 600 mm.
i) Handrails shall have no obstruction to the passage of a hand along the rail.
j) The inside handrail at landings shall always be continuous.

- Meet Australian Standards for Design for Access and Mobility and Building Code of Australia.
    a) A continuous accessible path of travel and any circulation spaces shall have a slip-resistant surface. The texture of the surface shall be traversable by people who use a wheelchair and those with an ambulant or sensory disability.
    b) Abutment of surfaces shall have a smooth transition. Design transition shall be not more than 3mm or 5mm, provided the edges have a bevelled or rounded edge to reduce the likelihood of tripping. [AS1428.1 2021 Clause 4.2 Figures 6 & 7]
    c) Slotted openings for stormwater grates, timber decking and boardwalks shall not be greater than 13mm and be oriented so that the long dimension is transverse to the dominant direction of travel. Where slotted openings are less than 8mm, the length of the slots may continue across the width of paths of travel. [AS1428.1 2021 Clause 4.4 & 4.5]

3.9 Signage

- Promotional signage and entry statement signage will require City of Armadale Planning Approval.
- Interpretative and way finding signage shall conform to the City's corporate style guide, available on request.
- Wayfinding, directional (other than to an accessible entrance or accessible toilet) or informative signage is not addressed in the Australian Standards called up in the Access Code of the Premises Standard or the National Construction Code, therefore, to meet the following requirements is not mandatory, but important to meet the needs of all people regardless of age or ability, and the intent of the DDA. It is recommended wayfinding, directional, or informative signage incorporates the following principles of good signage [AS1428.2 1992 Clause 17]:
    a) Any information provided on signs should be clear and unambiguous to read.
    b) Lettering (size, type, layout) to be clear and legible (i.e., sans serif font, in sentence or title case as appropriate to the environmental/signage context).
    c) Avoid the use of all capitals [Readability is reduced with ALL CAPS because all words have a uniform rectangular shape, meaning readers can't identify words by their shape (Reference: Harvard University Digital Accessibility)].
    d) Letter height to be appropriate to the required/anticipated viewing distance.
    e) The sign is not to reflect light nor be placed behind glazing (due to reflection and glare).
    f) The text is to be in 30% luminance contrast to the sign.
    g) The sign should contrast with the background surface.
    h) Avoid the use of multiple typefaces, and a patterned or visually cluttered background to the signage text.

i) Signage to be located at a height between 1200–1600mm from the finished floor surface, where it will be most visible to people seated and standing. Where space within the 1200-1600mm zone is not available, the sign can be extended downward, no lower than 1000mm.
j) Should the sign be obscured at any time (e.g., by crowds) it should be placed at least 2000mm high [preserving the accessible path of travel as per AS1428.1 2009 Clause 6.2 and Figure 2] with the text size correspondingly increased in size.
k) Best practice indicates directional signage should be consistent in style and located consistently along the path of travel so that it can be readily found and at key decision-making points.
l) Signage should not obstruct the accessible path of travel.
m) Free-standing signage (e.g., totems, boards) should be set off the accessible path of travel, on a hard stand with circulation space in front of at least 1540mm (width) by 2070mm (in the direction of travel) [AS1428.1 2009 Clause 6.5.3].
n) Ensure signage cannot be obstructed by foliage and the like.

- For building directory signage:
  a) Avoid including too much information.
  b) Use pictorial content including directional arrows and internationally recognised symbols where these are available. Ensure symbols are as intuitive to interpret as possible, in the context of the environment.

  In an environment supporting the needs of older persons or persons with cognitive impairment, consider the following [National Aged Care Design Principles and Guidelines, prepared by the Department of Health and Aged Care, July 2024]:

  c) The posture of older persons often results in a downward gaze, requiring effective signage to be located lower, ideally with the
  d) top of the signage no more than 1200-1500mm above the floor.
  e) Keep messaging short, easy to understand and easy to remember.
  f) Use language that is familiar and relevant to the environment/culture.
  g) Avoid acronyms and technical wording.
  h) Locate institutional signage (e.g. for service maintenance) in places that are less visible to building users/visitors and locate staff-only signage in back, not front-of-house areas.

3.10 Carparking

- Provide roadside carparking at the below rates:
  - Sporting spaces – refer to community planning team
  - Nature spaces (2 – local, 5- neighbourhood, 10 district)
  - Recreation spaces (2 – local, 5- neighbourhood, 15 district)
- Trees shall be designed into carpark arrangement as follows;
  - 1 tree per 3 parallel bays, runs of parallel bays greater than 3 will generally not be supported.
  - 1 tree per 4 bays for standard parking
- Bike parking should be considered in all parks to encourage people to arrive by bike.
- Carparking shall meet Australian Standards for parking facilities and Australian Standards for Design for Access and Mobility, including the provision of accessible parking bays as outlined as follows;
  a) An angle parking space shall comprise a combination of areas as follows [AS2890.6 2009 Clause 2.2.1]:
     i. A dedicated (non-shared) space of 2400mm wide by 5400mm long.
     ii. A shared area on one side of the dedicated space of 2400mm wide by 5400mm long. It may be entirely on the left or entirely on the right side of the dedicated space.

iii. A shared area 2400 mm long by 2400 mm wide at one end of the dedicated space. It may be entirely at the front or entirely at the rear of the dedicated space.
iv. The dedicated space and the shared area shall be at the same level.
v. A bollard shall be provided at the front and middle of the shared area.
vi. The angle-parking angle shall be between 45 degrees and 90 degrees. It is not required that all spaces within a car park be at the same parking angle.

b) A parallel parking space shall comprise areas as follows [AS2890.6 2009 Clause 2.2.2]:
   i. A dedicated space of at least 3200mm wide by 7800mm long
   ii. A shared area adjacent to the non-trafficked side of the dedicated space of at least 1600mm wide by 7800mm long.
   iii. The shared area may be at a higher level than the dedicated space in which case it shall be separated by a kerb not more than
   iv. 190mm high and shall be increased in width to accommodate kerb ramps in accordance with AS 1428.1.
c) Each parking space for people with disabilities and related walking and wheelchair unloading areas shall comprise a firm plane surface with a fall not exceeding 1:40 in any direction (1:33 if the surface is a bituminous seal and the parking space is out of doors). These areas shall have a slip-resistant surface. [AS2890.6 2009 Clause 2.3]
d) The path of vehicular travel from the car park entrance to all parking spaces for people with disabilities and from those spaces to the car park exit shall have a minimum headroom of 2200mm. The headroom above each dedicated space and adjacent shared area, measured from the level of the dedicated space shall be a minimum of 2500 mm. For an angle parking space, the headroom of the front of the space and its adjacent shared area may be reduced to lie within the profile. [AS2890.6 2009 Clause 2.4 Figure 2.7]
e) Where kerb ramps are to be provided, they shall be placed at a front or rear corner of the parking space. [AS2890.6 2009 Clause 2.5]
f) Each dedicated space shall be identified by means of a white symbol of access in accordance with AS 1428.1 between 800mm and 1000mm high placed on a blue rectangle with no side more than 1200mm, placed as a pavement marking in the centre of the space between 500mm and 600mm from its entry point. [AS2890.6 2009 Clauses 3.2]
g) Pavement markings shall be yellow and shall have a slip resistant surface. Raised pavement markers shall not be used for space.
h) Delineation. Pavement markings shall be provided as follows [AS2890.6 2009 Clauses 3.1]:
   i. Dedicated parking spaces shall be outlined with unbroken lines 80 to 100mm wide on all sides excepting any side delineated by a kerb, barrier or wall.
   ii. Shared areas shall be marked as follows:
      - Walkways within or partly within a shared area shall be marked with unbroken longitudinal lines on both sides of the walkway excepting any side delineated by a kerb, barrier or wall.
      - Other vacant non-trafficked areas, which may be intentionally or unintentionally obstructed (e.g. by unintended parking), shall be outlined with unbroken lines 80 to 100 mm wide on all sides excepting any side delineated by a kerb, barrier or wall, and marked with diagonal stripes 150 to 200 mm wide with spaces 200 mm to 300 mm between stripes. The stripes shall be at an angle of 45 ±10 degrees to the side of the space.
      - No shared area markings shall be placed in trafficked areas.
i) Signs should be provided where necessary, as follows [AS2890.6 2009 Appendix A3]:

i. Direction signs - If the route to parking spaces for people with disabilities is not readily apparent from the vehicular entrance to the car park, direction signs comprising the international symbol of access and an arrow should be used at the entrance and at each change of direction to direct traffic to the spaces. The symbol should point in the same direction as a left or right arrow.

ii. Space reservation signs - In public car parks linear parking control signs* bearing the user limitation '(Access Symbol) ONLY' should be used if it is necessary to formally reserve spaces for their intended use. Additional words such as PERMIT MUST BE DISPLAYED may be added to the signs.

3.11 Access Management

- 1.2m high chainlink fencing is to be installed around the perimeter of POS with a sport function.
- Bollards (composite flexi pole or painted timber) are to be installed around the perimeter of most recreational POS. Post and rail or 1.2m chainlink fence may be required for areas with high use playgrounds or to restrict motorbike access.
    a) Where bollards are located along a walkway, depending on the bollard finish, i.e. stainless steel, they may not be detectable by a person with vision impairment. Ensure any bollards located on the path of travel achieves a minimum 30% luminance contrast to the surrounding surfaces. [AS1428.2 1992 Clause 27.1(b)]
    b) Where bollards have reflective surfaces, e.g. stainless steel, the bollard is to have a 150mm thick band of contrast strip at the top section.
- A lockable maintenance gate with a dedicated 3m wide, reinforced concrete crossover shall be provided at agreed access points.
- Pedestrian Access gates within parks and playgrounds
    a) All pedestrian gates are to achieve the minimum clear open width of 850mm. [AS1428.1 2009 Clause 13.2]
    b) All pedestrian gates are to achieve the required circulation spaces. Where the pedestrian gates are approached from a footpath flanked by soft/inaccessible surfaces e.g. dirt or flower bed, the hardstand area shall also accommodate the required latch-side clearance. [AS1428.1 2009 Clause 13.3 Figures 31 or 32]
    c) Alternatively, where pedestrian gates are power operated, latch-side clearance is not required. [AS1428.1 2009 Clause 13.3.4]
    d) Where vestibules are designed between pedestrian gates, ensure that the minimum distance of 1450mm between the door leaves in either closed or open positions are maintained. [AS1428.1 2009 Clause 13.4 Figure 34]
    e) Excluding child safety gates, the gate hardware shall be lever type for hinged gates such that the hand cannot slip from the handle, ensuring the operation of the latch or D type for sliding gates. All gate handles must achieve the required 35mm to 45mm clearances to the back plate or gate face. The gate handle must be installed at 900mm to 1100mm high. [AS1428.1 2009 Clause 13.5.2 (a), (b), (c) and Clause 13.5.3(a)]
    f) The maximum force required to operate and hold open the pedestrian gates shall not exceed 20N. [AS1428.1 2009 Clause 13.5.2(e)]
    g) The pedestrian gates shall be self-closing. Alternatively, a horizontal handrail or pull bar shall be fixed on the closing face of the hinged gate. [AS1428.1 2009 Clause 13.5.2(f) Figure 36]
- Conservation / Nature Areas
    a) Conservation fencing is to be installed around the perimeter of POS with a nature function.

b) It is desirable to include accessible paths throughout conservation areas, however as these areas often include naturalistic, aggregate paths, restrictive fencing preventing unintended motorbike access and fauna control, pedestrian gates to achieving the minimum clear open width of 850mm. [AS1428.1 2009 Clause 13.2] are not always practical.
c) Loose gravel pathways are generally not permitted to be installed in POS or streetscapes, except as feature paving in however may be considered appropriate in conservation areas.
d) In these areas, combined maintenance gate / pedestrian gate arrangements may be appropriate to consider for conservation areas.

3.12 Lighting

- Lighting shall be limited to higher order parklands as per the facilities matrix.
- Within recreational POS or public access ways lights shall be installed on poles or within shelters. Lighting shall be LED and powered rather than solar. Provide vandal proof lighting options for consideration, with a design to Australian Standard - Lighting for roads and public spaces - for passive lighting.
- No inground or uplighting will be approved.
- A 'PE' cell and timer control system is to be installed with the control gear is to be accessible within the POS.
- Within District and Regional Sporting POS, lights shall be designed in accordance with Australian Standard LUX requirements for varying sports standards.

3.13 Play Spaces

- Equipment to be located within one general area, ensuring inclusive play areas are connected to primary walkways.
- Seating opportunities to be considered so as to provide clear sightlines for caregivers to the play areas.
- Ensure that inclusive play areas and associated seating opportunities are under shade. Shade options shall be provided, with preference being mature trees and constructed options considered for larger sites.
- Playground design and softfall shall be compliant with Australian Standards. Softfall shall be pinebark mulch or softfall rubber (no sand). Locate accessible and inclusive play equipment on a traversable surface such as rubber soft fall or compacted gravel. Avoid segregating the play areas into physically challenging play areas set over inaccessible surfaces.
- A diverse range of play opportunities which cater for a range of interactive activities including climbing, balancing etc. Disability inclusion and sensory play shall be considered for all playgrounds.
- In evaluation of the diversity of play opportunities on offer within a proposed playground, consider the following inclusions;
    a) Choice of play elements at ground level where access for all is possible.
    b) Choice of climbing structures to offer a variety of options in regards physical challenge and child ability.
    c) Good sightlines to play equipment, particularly in areas of play for younger children.
    d) Avoid raised lips around play equipment.
    e) Consider, if swings are to be provided, that a swing with body support is provided (e.g. hammock/birds nest swing).
    f) Where a slide is provided, replace with a double slide (so that children can slide together, or a parent can slide adjacent a child).
    g) Where significant play equipment items are provided in a playground that is not specifically designated as all-inclusive, specify the accessible version, such as a see-saw with a backrest; a flying fox with a supportive seat, a tunnel with an accessible path of travel through the centre,

sensory finishes, musical instruments, sand and water play, a shop front, a “clatter bridge” or dry creek bed, grinding stone and the like, all set on a traversable surface.

h) Consider access to quiet spaces for young people who prefer to play quietly or need to retreat, including cubby spaces, nooks, mia mia, arbours and the like.

- The Developer will organise an independent audit of the proposed playground prior to construction of the Works and submit to the City for its records.
- The Developer will organise an independent audit of the playground post installation and submit to the City for its records, inclusive of Softfall impact attenuation testing.
- All footings will require engineering design and certification.
- The Developer shall supply the City with the manufacturer’s details of equipment installation instructions; spare parts lists, warranties and instructions required for on-going maintenance of their equipment.
- Timber is not a preferred material. Should timber be approved it should be limited to high order district open spaces, with the timber used in the playground equipment shall be treated Durability Class 1 or 2 Hardwoods.
- Lead times for replacement items / pieces must be considered. Preference given to Australian sourced items.

3.14 Bins

Specifications for bins include the following:

- 120L or 240L plastic wheelie style bins are preferable.
- Bins shall be enclosed in a metal bin enclosure.
- enclosure where practicable.
- Located on a concrete hard-stand or equivalent and positioned with consideration for access for servicing.
- Dog waste disposal bags shall be stored in a metal dispenser mounted on to bin pole.

3.15 Furniture

- Off the shelf, locally sourced products are preferred. Custom furniture is not preferred and will only be considered for higher order parks (district or neighbourhood).
- Provide universally accessible seating options including circulation space.
    a) Seating opportunities should be considered at intervals of approximately 60-100m apart, especially between accessible parking bays/drop-off to points-of-interests. [National Disability Services, ACROD Parking Program - Individual Eligibility Criteria]
    b) Accessible seating options to include a hardstand in front of the seat to enable a mobility device user to manoeuvre to the front of the seat* and sit down (a depth of 1500mm is ideal). Include a hardstand to the side (or to both sides) of the seat so that a wheelchair user can be seated next to the park bench (this space also allows a pram to be parked next to the seat). This is described as a “wheelchair seating space” and is to be at least 800mm wide (1000mm preferred, for comfort) and 1300mm in length, ensuring the 1300mm does not protrude into an access path.
    c) Ensure when choosing the orientation of benches, that they offer desired views / sightlines, e.g. the river, the playground etc. This may mean the seat faces towards the path or is set with the seat back closest to the path. People who use a wheelchair should be afforded the opportunity to sit with friends and family seated on the bench, thus OHA advocate that bench seats are provided with an adjacent wheelchair seating space as described above. In the instance a seat is located with the seat back closest to the path, provide an access path to the side of the seat (this may also serve as the wheelchair seating space), then provide manoeuvring space to the front of the seat (to allow people with a walking aid or pram approach the seat and sit down). This

manoeuvring space should be ideally 1500mm deep, although 1200mm will suffice. [Sport and Recreation Access for All. 1996. Sport and Recreation Victoria.]

- All seating is to be constructed of steel or aluminium.
- Battens shall be aluminium or composite materials.
- Seating shall be installed with above or below ground fixings, where possible on a concrete hard stand.
- Seating shall have armrests and backrests to accommodate DAIP requirements, detailed as follows;
    a) Ensure the bench seat has a backrest and armrests, seat height of 450mm, preferred seat base depth of 450mm, a seat front where there is a clear space between the legs at ground level to within 150mm of the front edge of the seat and to within 100mm of the seat height to allow for rearward adjustment of feet when rising. [AS1428.1 1992 Clause 27.2]
    b) The seating should not protrude into any accessible path of travel and be set back 500mm from the accessible path of travel (this is to allow people to be seated, without their feet and other items such as bags, obstructing the access path). [AS1428.1 1992 Clauses 27.1]
    c) The material shall not be heat absorbent. [AS1428.1 1992 Clause 27.2]

3.16 Shelter

- All shelters shall be constructed of steel or aluminium (the City's preference is for the steel to be HD galvanised then powder-coated).
- Shelters shall be set on a hard-stand pad (e.g. unit paving or insitu concrete).
- Shelters shall be installed with below ground fixings where possible.
- Shelters shall be structurally certified by an accredited engineer and will require City of Armadale Building Approval prior to installation.
- Shelter and picnic facilities to be positioned to allow sufficient circulation space to accommodate DAIP requirements.
    a) A picnic table is to meet the following parameters [AS1428.1 1992 Clause 24 Figure 25]:
        i. 750±20mm high.
        ii. Knee and footplate clearance according to Figure 25 of AS1428.2 and Clause 24.1 (OHA would advocate that a minimum 720mm underneath clearance be achieved).
        iii. Underneath clearance width, between the legs or other fixture beneath the table, a minimum of 800mm, at the approach side of the table. This may be achieved either by:
        iv. removing a whole or part of a bench seat at the side of the picnic table and ensuring the table legs are greater than 800mm apart, or
        v. ensuring the cantilevered table end (620-640mm deep) is free from obstruction underneath, where a wheelchair user could make an approach to the table end (including ensuring the fixed seats are set a minimum 800mm apart).
        vi. In regards the associated bench seat, this is ideal to have a seat height of 450mm with a clearance of at least 200mm between the seat and table, with the seat no more than 320mm from the tabletop.
    b) Additionally:
        i. Provide a minimum 1540mm (width) and 2070mm (in the direction of travel), clear space on approach to the accessible part of the table. Ensure the accessible component of the picnic table is orientated toward the wheelchair approach.
        ii. For built shade structures, include a firm, level, 1500mm wide traversable surface around the perimeter of the picnic table (unobstructed by shelter support columns) as this will provide comfortable and usable access to the table for all people.
        iii. Ensure the picnic table is connected to other park amenities (accessible barbeque, bin, drinking fountain etc) via a continuous accessible path of travel.

iv. Ideally provide a minimum of one accessible picnic table under a shelter on a firm, level and even ground surface.

c) Ensure that the accessible circulation spaces under the shelters shall have the minimum 2000mm height clearance. [AS1428.1 1992 Clause 6.2]

3.17 Public Toilets

- Refer to the City's Public Toilet Strategy which further guides the design and implementation of public toilets.
    a) Accessible unisex sanitary facilities to comply with the full prescriptions of AS1428.1 2009 Clause 15.2. Where possible provide baby change tables within the accessible sanitary facilities.
    b) Where showers are provided, accessible showers are to comply with the full prescriptions of AS1428.1 2009 Clause 15.5.
    c) Sanitary compartments for people with ambulant disabilities to comply with the full prescriptions of AS1428.1 2009 Clause 16.
    d) The provision of an adult change table and hoist and an appropriately furnished room to meet the toileting and changing needs of people with high physical support needs (or the provision of a Changing Places facility) are to meet NCC 2022 S27 or Changing Places Design Specifications 2020 respectively. Consider the location of the adult change facilities where it is central and accessible to people from all areas.

3.18 Barbecue

- Electric, consisting of either brick or aluminium panels.
- Either single or double cooktop.
- Located on a concrete hard-stand or equivalent.
- Generally located in conjunction with a bin, picnic area and drink fountain.
- Where barbeques are provided, at least one accessible barbeque option is to be included. Key access elements to include when an accessible barbeque is provided are as follows:
    a) Specify an accessible style of barbeque that features (ideally) a 720mm knee clearance height.
    b) Provide an accessible path of travel to the barbeque area that also connects to the other picnic facilities.
    c) Provide sufficient hardstand so that a person with a mobility impairment can move around the barbeque and approach the accessible side, this should include a minimum 1000mm wide path of travel up to and alongside the barbeque and 1540x2070mm turning space in front of the barbeque.
- The inclusion of a water supply with a vandal proof tap will be required to facilitate cleaning of the area.
- Consider placement beneath a shelter for shade and protection from rain, assisting with fat tray overflow.

3.19 Drink Fountain

- Constructed of either steel or aluminium, Exteria Slimline drink fountain or equal approved.
- Accessibility to be considered in the drink fountain design, with consideration of the following key access elements;
    a) Drink fountain to have a circulation space of 1540x2070mm (minimum) allowing a front or side-on approach [AS1428.2 1992 Clauses 6.2 & 27.1 Figure 33]:
        i. not obstructed by steep slopes or water pooling (from the fountain use);
        ii. of a firm, traversable, even and level surface
    b) Provide knee clearance underneath of at least 720mm with sufficient clearance for wheelchair footplate. [AS1428.1 2009 Figure 45]

c) Has functional components (e.g. spout and drinking bottle refill), that meet the height and depth reach ranges, to be operated by all people from either a standing or seated position, with push button or lever control 800-1000mm high; located on the front of the fountain, that is light to operate.
d) Locate the drink fountain on a traversable surface with circulation space that enables all users, including people using wheeled mobility devices, to manoeuvre into a position to operate all functions.
e) Orientated the drink fountain so it is accessible but does not obstruct pedestrian traffic. [AS1428.2 2009 Clause 27.1(a)]

- A tilt-able dog bowl attachment to be included.
- Drainage is to be provided via either a soak well or a connection to an outlet.
- Drink fountains to be installed on a traversable surface / hardstand, with crossfall graded onto adjacent garden bed.
- Isolation value to be incorporated to base of drink fountain.

3.20 Shade Sails

- Constructed shade sail options considered for district or neighbourhood scaled playgrounds.
- Galvanised & powder coated metal poles shall require structural certification by an accredited engineer. Building approval is to be issued by the City prior to installation.
- Shade sails should provide a high level of UVR protection.
- The lowest point of the shade sail should be installed at 2.5m above the tallest part of the equipment installed underneath.
- Poles are to be located so that access is available for removing and reinstalling shade sails.
- Shade sails to be designed and positioned to ensure does not compromise fall zones and compliance with relevant playground safety standards. Shade sail design to be captured in playground audit to ensure fall zone compliance.

3.21 Art

- Refer to the City of Armadale Art Strategy for further detail. With consideration for accessibility, consider the following elements.
    a) Set the artwork off to ensure the artwork shall not protrude into the accessible paths of travel. [AS1428.2 2009 Clause 27.1(a)]
    b) Where artwork is set over accessible paths of travel, ensure that a minimum of 2000mm overhead clearance is maintained. [AS1428.1 2009 Clause 6.2]
    c) Consider utilising artwork as visually distinctive wayfinding landmarks at locations where directional decisions need to be made, is particularly useful for people with cognitive disabilities or people with low vision.
    d) Avoid use of strong patterning on pavers or slippery surfaces.

3.22 Youth Spaces – Basketball, pump, skate etc

- Basketball courts are to be placed a reasonable distance from housing. It is likely 50-100m separation from houses is required. A noise assessment will be required for basketball courts to support the submission.
    - Basketball backboards are to be noise reducing and the surface shall utilise noise attenuation surfacing.

  - The surface may vary depending on intended usage (surface options include insitu poured concrete, asphalt, plexi-pave or similar, the surface shall be hardwearing)
- Pump and Skate parks are to be placed a reasonable distance from housing. It is likely 50-100m separation from houses is required. A noise assessment will be required to support the submission.

3.23 Fitness

- Equipment shall be installed as per manufacturers' specifications, including any required fall zone and associated fall zone material.
- Preference for static rather than dynamic exercise equipment, to be installed.

4. Softworks

4.1 PSHB compliance – trees, shrubs and mulching

Polyphagous shot-hole borer (PSHB) *Euwallacea fornicatus* is a beetle native to Southeast Asia. Establishment of the pest in WA would have a significant impact on our urban canopy. Measures to reduce the risk of transfer are to be implemented as best practice.

- Mulch is to be free of weeds, propagules, pathogens, allopathic organisms. Pasteurized and Certified to AS 4454 Composts, Soil Conditioners and Mulches. If machinery has been used to handle green waste or mulch within a quarantine area (QA), the equipment must be cleaned of wood material prior to leaving the QA and entering the City.
- When undertaking landscape works, investigate if a Permitted Movement Notice is required. If plants are sourced from a nursery within a QA and are over are over 2cm diameter, a permit to supply outside of the QA is required. Should the plants be sourced from within a QA, the City requests installers thoroughly inspect the stock for pests and diseases. Copies of the permit and evidence of inspection of plant stock prior to planting will be requested at Practical Completion.
- These trees should also be monitored for activity:
  - *Acer negundo*
  - *Coprosma repens*
  - *Delonix regia*
  - *Erythrina x sykesii*
  - *Ficus macrophylla*
  - *Ficus rubiginosa*
  - *Morus alba*
  - *Morus nigra*

Landscapers should regularly refer to the DPIRD website for an up-to-date list of species affected before planting.

4.2 Bushfire considerations

- A Bushfire Management Plan may apply, and this should be cross referenced. The landscape design is to reflect the agreed POS vegetation classification within the BMP. Please note that the City will not accept designs or management plans that document a Public Open Space (POS) being designed or maintained to low threat. Shade canopy and tree positioning is critical for the hot Perth climate and designs shall target a canopy cover of 60% within parklands.
- When developing Bushfire Management Plans (BMP), note that the City will not accept management plans that document a Public Open Space (POS) being designed or maintained to low threat. Designing and maintaining to 'Low threat' places unobtainable maintenance obligations on the City and is considered a risk to property or persons.
- When drafting the management plan, the best approach is for the post development vegetation classification to reflect the ultimate designed / revegetated state for the POS and be classified accordingly. The Bushfire Attack Level (BAL) ratings of adjacent residential development are required to reflect this and be rated accordingly.
- Under the state guidelines there is provision for exclusions under AS3959-2009 Clause 2.2.3.2 9 (f) Exclusions. This shall only be accepted for POS excluded on the basis of size and it shall be demonstrated that there is no requirement for the City to manage or design POS now or into the future to 'low threat' state.
- The following descriptions are derived from objectives for maintaining low threat vegetation within an Asset Protection Zone (APZ). As such the above description for designing and maintaining low threat vegetation is not acceptable and the City will not accept handover of parklands designed to this standard -
    - Fences within APZ are to be constructed from non-combustible materials.
    - Fine Fuel loads are measured as the total dry weigh of all (fine) fuels which are thinner or have a diameter of or less than 6mm. Measures managing Fine Fuel Load are to include removal of dead vegetation on a regular basis and fuel load should be maintained at < 2 tonnes per hectare (on average).
    - Mulches should be non-combustible such as stone, gravel or crushed mineral earth, or wood chip greater than 6mm in thickness.
    - Frequent mowing of turf to maintain at less than 100mm height.
    - Trees are defined as being greater than 5m in height within the guidelines. Trees at maturity should be minimum distance of 6m from all elevations of the buildings. Dependent on tree species and mature size, trees to be positioned between 5-10m spacing.
    - Branches at maturity should not touch or overhand a building or powerline. Lower branches and loose bark should be removed to a height of two metres above ground and / surface vegetation to provide adequate separation between tree canopy and understorey vegetation.
    - Canopy cover within the APZ should be less than 15% of total APZ area.
    - Tree canopies at maturity should be at least 5 metres apart to avoid forming a continuous canopy. Stands of existing mature trees with interlocking canopies may be treated as an individual canopy provided that the total canopy cover within the APZ will not exceed 15% and are not connected to the tree canopy outside the APZ.
    - Shrubs are defined as 0.5m – 5m in height within the guidelines. No shrub planting to be located under trees or within 3 metres of a building.
    - Shrubs should not be planted in clumps greater than 5 metres in area. Clumps should be separated from each other and any exposed window or door by at least 10 metres.
    - Ground covers are defined as less than 0.5m in height within the guidelines. In this context, groundcovers can be placed under trees but must be maintained to remove dead plant material as prescribed in fine fuel load. Groundcovers can be located within two metres of

a structure, however, must be placed three metres from windows or doors if greater than 100mm in height.

- Further information can be found in:
    - AS3959:2018 – Construction of Buildings in Bushfire Prone Areas
    - Guidelines for Planning in Bushfire Prone Areas (Department of Planning)
    - Plant Guide within the Building Protection Zone for the Swan Coastal Plain of Western Australia (FESA)

4.3 Turf

- Within the design, turf is to be bordered by a kerb or path, refer to garden bed edging.
- Turf shall be installed above the 1:5 flood zone.
- Installation of subsoils is not preferred, rather the City requires a 700mm separation from peak ground water to the finished turf level.
- Rootzone sand shall be installed for turf to a depth of 200mm for non-active turf and installed rootzone sand shall be AS4419 Certified. Refer to the City's standard oval design specification for active turf sites.
- Gradients within turfed areas shall not exceed 1:6. Designs shall allow for a turning circle of 3m radius around any trees, structures or furniture to enable the ride on mower access.
- All turf shall be agricultural variety kikuyu. The rolled turf shall be sourced from an accredited commercial turf farm.
- The turf shall be free of any visible weeds. Turf shall be certified free of the Sting nematode (*Ibipora lolii*). The City may nominate an independent laboratory to undertake turf quality assessments should additional verification be required. Provide details of supplier and product to City for approval prior to purchase.

4.4 Garden Beds

- Garden beds shall be bordered by a concrete edge or pathway. The gradient within shall be max 1:5.
- All stock shall be supplied by accredited suppliers and shall be in accordance with the approved Plant Schedules and Drawings.
- Stock purchased shall be vigorous, well established, hardened off, of good form consistent with species or variety, not soft or forced, free from disease and insect pests, with large healthy root systems and no evidence of having been restricted or damaged.
- For garden beds provide 3 x 130mm pots per square meter. Should tubestock be approved, provide 4 x tubestock per square meter.
- At time of planting, install stock with Wetting Agent and Fertiliser as per manufacturers recommendations ('WettaSoil' and Polycote Native Blend 15-0.5-10+TE or equivalent).
- For natural areas, refer to the management plan for details.

4.5 Mulch

- Mulch shall be applied to a depth of 75mm in all planting mix areas.
- Mulch shall be applied to a depth of 100 mm in non-planting areas.
- Mulch shall be kept just clear of the plant stem.
- Mulch shall be chipped Pine Bark Mulch for high visibility areas. Mulch is to be free of weeds, propagules, pathogens, allopathic organisms. Pasteurized and Certified to AS 4454 Composts, Soil Conditioners and Mulches. Provide details of supplier and product to City for approval prior to purchase.
- Site mulch is not approved. Lower grade mulch will be acceptable for low visibility dry gardens subject to approval. Mulch is to be free of weeds, propagules, pathogens, allopathic organisms. Pasteurized and

Certified to AS 4454 Composts, Soil Conditioners and Mulches. Provide details of supplier and product to City for approval prior to purchase.

4.6 New Trees

- Shade canopy and tree positioning should consider maximising shade over pathways and playgrounds. Designs shall target a canopy cover of 60% within parklands.
- Trees are preferred to be located in garden beds instead of turf areas.
- Trees in turf are to be kept to a minimum. Trees installed within turf, shall be installed within 3m diameter tree well.
- Trees shall be planted a minimum 1m from any hard paved surface or edge and 4m away from nearby houses.
- Trees are preferred in 45L, 100L and 200L bag sizes.
- Trees located within paved surfaces, or which are deemed to pose a risk for future root damage, are to be installed with root barriers.
- The Contractor shall ensure that trees are purchased are in accordance with the Australian Standard AS2303 'Tree Stock for Landscape Use' 2015.
- Trees stock shall feature a defined central leader and the apical bud intact.
- Trees stock shall be free from harmful pests and diseases.
- At time of planting install 30-45lt stock with hardwood stakes, painted black 50x50x2000mm. Two stakes per tree, stakes shall be installed with 500mm in ground and 1500mm above ground. Apply ½ bag aged, bagged manure, Polycote Native Blend Controlled Release fertiliser and "WettaSoil" wetting agent or equivalent as per manufactures specifications.
- Tree diversity is encouraged, native trees supported and species selection subject to approval.

4.7 Basins and swales

- All swale/overland flow areas are to be formed, as required, to provide the correct design levels, batter shape and slope in accordance with the requirements of the Urban Water Management Plan (UWMP) and civil drawings. On completion, the drainage areas will require sign off by the contract engineer that they comply with the UWMP and civil drawings.
- All Stock shall be supplied by accredited suppliers and shall be in accordance with the approved Plant Schedules and Drawings.
- Stock purchased shall be vigorous, well established, hardened off, of good form consistent with species or variety, not soft or forced, free from disease and insect pests, with large healthy root systems and no evidence of having been restricted or damaged.
- For swales and basins, provide 4 x tubestock per square meter.
- Ensure conveyance swales have a clear zone to base channel, free of planting (1-2m wide, location dependant).
- Prior to planting ensure swale is at the correct levels.
- Embankment gradients shall be a maximum 1:4 to be planted. 1:3 and steeper shall be rock pitched.
- Swales and basins are typically not mulched with mulch only approved for use above the top water level.
- The Developer is required to obtain the relevant clearing permit(s) from Department of Biodiversity, Conservation and Attractions (DBCA) for the removal of Typha within their development area.

4.8 Revegetation Works

- Works associated to be undertaken within an identified environmentally sensitive area, are to be undertaken in accordance with the endorsed management plan. Refer to environment team.

4.9 Irrigation

- Refer to the City of Armadale specification.

4.10 Groundwater resource

- All groundwater licences applied for by Developers will be for a minimum term of ten (10) years and have a specific abstraction volume and authorised use for “irrigation purposes”. Construction/Dust suppression licences shall be a separate licence.
- The Developer must coordinate the transfer of a current Ground Water Abstraction licence with appropriate abstraction volume commensurate with the type and scale of irrigation requirements six (6) months prior to coincide with formal handover.
- The Department of Water and Environmental Regulation may on occasion not accept or administrate transfer of very small portions of a groundwater licence until such time as the development reaches 25% completion and handover.
- Groundwater licences with less than twelve months until expiry will need to be amended by the Developer, with the Department, prior to handover to the City for the full ten (10) year term.

5. Streetscapes

5.1 Roundabouts

- Treatments to access and local roads shall be limited to street trees, mulch and hard paving.
- Higher order roundabouts such as ones located on distributor roads shall be limited to street trees, grass trees, hard/ feature paving and low ground covers where irrigation is available.
- All roundabouts shall have a minimum 2-3m kerbed paved surround with a minimum 600mm mulch only area before any soft planting in the middle. This provides a safe maintenance zone.
- All proposed tree locations shall be confirmed by engineering to ensure sightlines are achieved.

5.2 Median island treatments

- Median islands shall be limited to street trees, mulch and hard paving. Understorey planting will not be approved unless the median functions as a swale.
- Offset to tree placement from the road edge shall be considered in line with the liveable neighbourhood guidelines.

5.3 Median islands treatments – Swales

- Where median islands form a treatment swale, low ground covers as an understorey planting will be approved in addition to tree planting.
- Offset to tree placement from the road edge shall be considered in line with the liveable neighbourhood guidelines.
- Treatments to slow the waters movement into the swale shall be implemented such as mortared rock and jute matting.
- Swales shall have a 600mm offset to planting from the road edge. This shall be filled with mulch if suitable or a hard treatment such as mortared rock or compacted gravel.
- All proposed tree locations shall be confirmed by engineering to ensure sightlines are achieved.

6. Asset Management and Data Collection

6.1 A-spec

The City requires the developer/consultant to submit A-spec data in GIS READY FORMAT in accordance with the current A Spec standards at Practical Completion.

The City's Asset Management department has the required qualifications and experience in-house to undertake and complete the required A-Spec documentation outlined. The City will complete the works to the quality and standards required by the City, and the Developer will be provided with a copy of the A-Spec documentation for their records at the completion of the works.

The quote for the provision of A-Spec documentation can be provided on request. If the City is awarded the provision of A-Spec documentation Condition 4 will be deemed complete.

For further information or assistance, please contact the City's Asset Management Department on 9394 5000 or email the Asset Management department on assetmanagement@armadale.wa.gov.au. Further information is available on the A Spec website at www.a-specstandards.com.au.

6.2 As-con drawings

In addition to A-spec, the City requires the developer/consultant to submit 'as constructed' drawings in PDF and DWG of:

- As-constructed documentation of landscaping including hard works, soft works, furniture, playgrounds
- As-constructed documentation of irrigation systems
- As-constructed documentation of electrical systems
- As-constructed documentation of scheme water connections

6.3 Asset Schedule

The City requires the developer/consultant to submit information about the landscaping as an asset management schedule including a schedule of items, costs and useful life. This shall be provided at Practical Completion and considered throughout the design phase to ensure the information is captured.

7. Construction Phase

Before proceeding to build the design as per the above specifications, ensure the appropriate approvals are in place.

7.1 Approvals

- Cross reference IFC drawings against approved landscape and civil plans to ensure compliance. Forward the IFC set to the City. Check the approval of the landscape drawings – the approval is valid for two years only.
- Separate approvals are required to be obtained for dust and noise management. Please contact the City's Health Services Department for further details.
- Structural Approval and building licence approval is required for all retaining walls, fencing and all other structures prior to commencement of construction. Provide structurally signed drawings for City reference and records.
- Traffic management and works within the road reserve require an application to be submitted for approval – refer to https://www.armadale.wa.gov.au/traffic-management-plansworks-road-reserve

- To mitigate noise complaints, works are to be undertaken between Monday to Friday from 7.00am to 5.00pm

7.2 Contractors

It is the Developers responsibility to ensure Contractors engaged to undertake works are professional and meet the following requirements.

- Contractors shall be experienced, reputable landscape contractors with relevant qualifications to the scope of works.
- Contractors shall have a comprehensive WHS Management System
- Appropriate levels of insurance are to be in place. The Developer is required to hold, current and valid, Public Liability Insurance for no less than $20 million in any one occurrence, once the POS has been created, during construction and throughout the entire maintenance period over the Public Open Space and any associated landscape works within the development. The Public Liability Insurance shall indemnify the City of Armadale against any potential claims.
- The contractor undertaking the construction works on behalf of the Developer and shall also hold the relevant insurance policies. It is the responsibility of the Developer and their consultant team to ensure that the relevant insurances are in place and valid.
- The Developer is required to install the parkland and associated infrastructure to ensure that there is no potential harm to the users. Issues associated with safety are to be addressed immediately and recorded by the relevant contractor engaged by the Developer.
- The Developer shall be responsible for the protection of existing infrastructure including, but not limited to, kerbing, roads, footpaths, lot hydromulching. Private lots, roads, carbays and verges are not to be utilised for the laydown of materials.

7.3 Site Preliminaries

Before proceeding to build a developer must ensure all site safety and protective measures are in place.

- The developer shall ensure measures are in place to protect existing infrastructure in and around the site.
- The developer shall ensure all existing vegetation to be retained is protected as agreed and arborists recommendations have been actioned.
- The developer shall ensure the work site is safety fenced, and a site-specific safety management plan is in place prior to works being undertaken.
- A plan is in place to protect the site from sand drift and builders rubbish and the Contractor has facilities to remove all waste and by-products generated by the works daily.

7.4 Certification

During the Construction phase the developer shall ensure the following certifications and audits are undertaken as outlined within and provided to the City for its records:

- Soil certification
- Playground Play Safety
- Tree inspections
- Sting nematode certification
- Structural certification
- Soil and mulch certification
- Electrical certification

Standard Construction Inspection Checklist

The City shall attend inspections during the construction phase with the developer to monitor the installation works being undertaken. This checklist is provided for information to developers and will be utilised by City Officers during the construction period.

Inspection Details - Internal Use

Location

Development / Stage

Attendance

File reference

Date

Inspection timing **Allow 5 days notice**	Start up meeting	
	Tree protection fencing	
	Irrigation mainline installation before backfill	
	Playgrounds, Structures and Concrete footings - Completion of Footings for structures installation before backfill	
	Inspection of supplied plants and trees on site prior to installation	

Start up	Yes/No	Comments
Review inspection list - Are there any approvals or submissions upcoming or due?		
Has a TMP or works in road reserve been completed?		
Inspection timeframes discussed?		
Contact details exchanged?		
Other Comments		

Tree protection	Yes/No	Comments
Agree extent of site fencing and protection of trees and inspect on site actual fencing installed		
Check- are existing trees showing signs of stress?		
Other comments		

Irrigation	Yes/No	Comments
Request joint inspection with Irrigation Supervisor. Allow 5 days notice		
Other comments		

Playgrounds, Structures and Concrete footings	Yes/No	Comments
The Developer will organise an independent audit of the proposed playground prior to construction of the Works and submit to the City for its records		
Any structural drawings or copies of building licenses to be provided?		
Playground footings – site photos and inspection - playgrounds, shelters, furniture		
Shelter footings – site photos and inspection		
Furniture footings – site photos and inspection		
Other comments		

Mulch and planting	*Yes/No*	*Comments*
Mulch - Provide details of supplier and product to City for approval prior to purchase		
Turf shall be certified free of the Sting nematode (Ibipora lolii). Provide details of supplier and product to City for approval prior to purchase		
PSHB compliance - Permitted Movement Notice		
Other comments		

Asset Management Schedule

The City requires the developer/consultant to submit information about the landscaping as an asset management schedule including a schedule of items, costs and useful life. This shall be provided at Practical Completion and considered throughout the design phase to ensure the information is captured.

Location Details			
Location			
Development / Stage			
Date of PC Inspection			
Organisation Name		**Contact Name :**	
Contact Phone		**Email :**	

Landscape Details			
Installation Contractor		**Email :** **Phone :**	
Maintenance Contractor		**Email :** **Phone :**	

Item	Measure	QTY	Installation Cost (rate)	Average useful life
Soft works				
Irrigated Garden Bed	sq m			
Basins / swale	sq m			
Natural area	sq m			
Mulch Only Area	sq m			
Turf	sq m			
Trees 45lt	Item			
Tree 100lt and above	item			
Trees 5lt and below	Item			
Hard works				
Playground Softfall Rubber	sq m			
Playground Softfall Mulch	sq m			
Playground pieces	Item			
Shade sails	Item			
Shelters	Item			
Bins	Item			
BBQ (plates)	Item			
Boardwalks	sq m			
Concrete hardstand / Footpaths	sq m			
Bollards	Item			
Fencing	Lin.m			
Custom items - BMX/skate	Item			