

## VEHICULAR EXCLUSION MECHANISMS

Vehicular exclusion mechanisms are treatments installed around the periphery of public open space and tree protection reserves in the interest of protecting pedestrians from injury and public open space from damage as a result of unauthorised vehicular movements and parking.

Vehicular exclusion mechanisms shall be designed to complement and enhance the amenity of the surrounding urban environment and landscape character. Vehicular exclusion mechanisms may comprise earth mounding, rock placement, planting, bollards, fencing and/or walls. All barriers should be low and visually permeable to avoid dominating views and to enable passive surveillance into open space areas. Council's general preference is for continuous low profile fencing.

The type of vehicular exclusion mechanism employed shall be used consistently throughout the development and shall match and/or compliment treatments previously installed in close proximity. The type of treatment and final design shall be determined on a case-by-case basis in consultation with the responsible authority.

Council strongly encourages the use of sustainable materials for vehicular exclusion mechanisms including the use of plantation hardwood and durable recycled materials.

All vehicular exclusion mechanisms shall be setback a minimum distance of 900mm from the back of kerb for a municipal road comprising a speed limit of 50km per hour or less. This offset will accommodate car doors when a vehicle is parked adjacent to the treatment and will discourage vehicles from parking on the nature strip proper.

Where a standard width path (1.5 metres in width) transects a vehicular exclusion mechanism, the vehicular exclusion mechanism shall abut the edge of path (refer to **SDL.3.01**). Where a shared path (2.5 metres in width) transects a vehicular exclusion mechanism, a removable, lockable bollard shall be installed in the centre of the path (refer to **SDL.3.03**). This bollard shall include high visibility reflectors to minimise risk management issues.

At least one emergency/maintenance access point shall be provided for each open space area in the form of a removable, lockable bollard or a robust lockable gate. The minimum opening for an emergency/maintenance gate is 3.0 metres for lower order reserves and 4.0 metres for higher order reserves. Removable bollards and gates shall be designed to complement the adjacent vehicular exclusion mechanism. Maintenance access must not occur via a shared path entry/exit point. Maintenance access must be provided independently from dedicated pedestrian access points.

### Fixed Bollards (SDL.3.01)

Bollards and other vertical treatments that do not comprise a horizontal element shall be installed at a maximum interval of 1.5 metres from centre to centre.

Council will consider a range of bollard types, profiles and materials including timber, concrete, galvanised steel, stainless steel and recycled composite plastic.

As a minimum guide, bollards shall comprise dressed seasoned hardwood with a Natural Durability Class of 2 or better to ensure a 25+ year service life. All timber shall be straight, clean and free of defects (splits, loose knots, cavities and splinters). Council will not accept the use of treated softwood for this application.

The minimum bollard dimension is 125mm X 125mm in width and shall comprise 400mm below ground and between 600mm to 800mm above ground. Concrete footing shall be nominally 350mm X 350mm in width and 450mm in height installed on a 50mm bed of Class 2 (20mm) crushed rock. Concrete shall be 25 MPa minimum. The top of the concrete footing must include a splay (30 degrees minimum) running away from the upright.

All finishes (paints and stains) applied to minimise weathering and/or for aesthetic reasons shall be considered on a case by case basis and reapplied every 18 months or as required.

### **Frangible Bollards (SDL.3.02)**

Frangible bollards shall be installed in proximity to road reserves where appropriate offset distances cannot be achieved from the back of kerb. Council will consider a range of fracture point details including drilled impact holes and/or bolt down details.

As a minimum guide, frangible timber bollards (as per the fixed bollard notations above) shall comprise a 50mm diameter drill hole installed 150mm above the finished ground surface.

### **Removable Bollards (SDL.3.03)**

Removable bollards shall be installed in the centre of shared paths where the path enters open space or to provide emergency/maintenance access to lower order parks and reserves. To achieve DDA compliance, a minimum width of 1100mm must be provided on both sides of the removable bollard (ie. 1100mm clearance between the removable bollard and any adjacent obstruction).

Removable bollards (as per the fixed bollard notations above) shall be installed using a Barling's or similar approved galvanised RHS sleeve with hinged lid. It must be demonstrated that the sleeve will ensure a tight fit with the bollard proper (nominally 3mm clearance all round). A galvanised eye nut screwed into the bollard shall be installed to fit the hinged lid opening to enable the bollard to be fixed in place via a Council Abloy padlock at handover.

To accommodate Council's OH&S requirements, the removable bollard shall be fitted with 2 galvanised heavy duty "D" handles rebated and attached to the upright via galvanised countersunk screws. The handles shall be aligned in the direction of the path to ensure that they do not obstruct pedestrian access.

Removable bollards shall be of a contrasting colour to the surrounding finished ground surface and shall be fitted with reflective tape or reflector disks rebated 10mm into the bollard. The centre of the reflective tape or disk shall be installed 100mm below the top of the bollard.

### **Post and Cable Fence (SDL.3.05 & SDL.3.06)**

Uprights associated with post and cable fencing shall be nominally spaced at 3.0 metre intervals from centre to centre.

As a minimum guide, uprights shall comprise dressed seasoned hardwood with a Natural Durability Class of 2 or better to ensure a 25+ year service life. All timber shall be straight, clean and free of defects (splits, loose knots, cavities and splinters). Council will not accept the use of treated softwood for this application.

The minimum upright dimension is 125mm X 125mm in width and shall comprise 400mm below ground and between 600mm to 800mm above ground. Concrete footings shall be nominally 350mm X 350mm in width and 450mm in height installed on a 50mm bed of Class 2 (20mm) crushed rock. Concrete shall be 25 MPa minimum. The top of the concrete footing must include a splay (30 degrees minimum) running away from the upright.

As a minimum requirement, the horizontal cable shall be 10mm in diameter (7 strand – 7 wire) and galvanised. The maximum sag in the cable between any span shall be a maximum of 125mm. The cable shall be held in position via galvanised ferrules on either side of every third post or at end posts or via a countersunk galvanised screw. Where ferrules are used on end posts, the ferrule shall be rebated and concealed by a 75mm X 75mm galvanised plate secured by 4 galvanised screws. The plate should be finished flush with the post. Where the galvanised cable is cut on site, the cut area must be appropriately treated with a zinc rich, cold galvanising paint (Stramit Zam or equal). Cold galvanised paint shall be re applied every 3 years or as required. The centre of the cable shall be installed 150mm below the top of the bollard.

A 1500mm (maximum centre to centre) informal pedestrian entry point shall be provided every fourth bay (ie every 9.0 metres) adjacent to lawn areas and/or hard pavement. Continuous fencing should be specified forward of all garden bed areas.

All finishes (paints and stains) applied to minimise weathering and/or for aesthetic reasons shall be considered on a case by case basis and reapplied every 18 months or as required.

### **Post and Tube Fence (SDL.3.07)**

Uprights associated with post and tube fencing shall be nominally spaced at 3.0 metre intervals from centre to centre.

As a minimum guide, uprights shall comprise dressed seasoned hardwood with a Natural Durability Class of 2 or better to ensure a 25+ year service life. All timber shall be straight,

clean and free of defects (splits, loose knots, cavities and splinters). Council will not accept the use of treated softwood for this application.

Uprights should be nominally 150mm X 150mm in width and shall comprise 400mm below ground and between 600mm to 800mm above ground. Concrete footings shall be nominally 350mm X 350mm in width and 450mm in height installed on a 50mm bed of Class 2 (20mm) crushed rock. Concrete shall be 25 MPa minimum. The top of the concrete footing must include a splay (30 degrees minimum) running away from the upright.

As a minimum requirement, the horizontal tube shall be 65mm in diameter and galvanised. The tube shall be housed in a 50mm deep rebated hole drilled in each end post. Where the galvanised tube is cut on site, the cut area must be appropriately treated with a zinc rich, cold galvanising paint (Stramit Zam or equal). Cold galvanised paint shall be re applied every 3 years or as required. The centre of the tube shall be installed 150mm below the top of the bollard. The tube shall be secured in position via a countersunk galvanised screw to the side of the post facing the reserve.

A 1500mm (maximum centre to centre) informal pedestrian entry point shall be provided every fourth bay (ie every 9.0 metres) adjacent to lawn areas and/or hard pavement. Continuous fencing should be specified forward of all garden bed areas.

All finishes (paints and stains) applied to minimise weathering and/or for aesthetic reasons shall be considered on a case by case basis and reapplied every 18 months or as required.

### **Post and Rail Fence (SDL.3.08)**

Uprights associated with post and rail fencing shall be nominally spaced at 2.4 metre intervals from centre to centre.

As a minimum guide, uprights shall comprise dressed seasoned hardwood with a Natural Durability Class of 2 or better to ensure a 25+ year service life. All timber shall be straight, clean and free of defects (splits, loose knots, cavities and splinters). Council will not accept the use of treated softwood for this application.

End posts shall be nominally 200mm X 200mm in width and be 1800mm in height (700mm below ground and 1100mm above ground). Concrete footings shall be nominally 500mm X 500mm in width and 750mm in height installed on a 100mm bed of Class 2 (20mm) crushed rock. Intermediate posts shall be nominally 150mm X 150mm in width and be 1800mm in height (700mm below ground and 1100mm above ground). Concrete footings shall be nominally 500mm X 500mm in width and 750mm in height installed on a 100mm bed of Class 2 (20mm) crushed rock. Concrete shall be 25 MPa minimum. The top of the concrete footing must include a splay (30 degrees minimum) running away from the upright.

As a minimum requirement, the horizontal rails shall be 200mm X 50mm. The rail shall be housed in a 60mm deep rebated hole at each post. The rail shall be secured in position via a countersunk galvanised screw to the side of the post facing the reserve.

All finishes (paints and stains) applied to minimise weathering and/or for aesthetic reasons shall be considered on a case by case basis and reapplied every 18 months or as required.

This detail is preferred to the Melbourne Water standard drawing (7251/8/206) for a safety barrier around ponds and wetlands (ie head/end walls).